

Attachment 5

Referenced Reviewing Agency Comment Letters and Documents Referenced

Attachment 5: Referenced Reviewing Agency Comment Letters and Documents

***Note to Reader* Some documents are long. If Attachment is downloaded there are searchable headings for each comment letter and documents on the left side of a PDF viewer.**

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B2HAPPDoc ApASC Exhibit N - IPC Responses to ODOE's RAI-4

**Idaho Power's Response to ODOE's Request for Additional Information 4
 Exhibit N – Need
 Boardman to Hemingway Transmission Line Project
 January 2018**

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
ApASC RAIN-1	Section 3.2.1, Page N-5	OAR 345-023-0020(2)	<p>Note: It is stated in Section 3.2.1 that the development of B2H has been included in the short-term plan of action in IPC's Integrated Resource Plans in 2009, 2011, 2013, and 2015, and that the Oregon Public Utilities Commission has acknowledged each plan. As such, IPC states that EFSC must find that the need standard has been met.</p> <p>However, as described in the PUC's orders regarding the IPC 2013 and 2015 IRPs, the PUC only acknowledged the ongoing permitting, planning, and regulatory filings related to B2H. ODOE would consider the "development" of a project to include both the permitting and planning as well as the actual construction. The PUC orders state that the construction of B2H is beyond the typical IRP planning horizon.</p> <p>OAR 345-023-0020(1) states that the "Council shall find that the applicant has demonstrated need for the facility if the capacity of the proposed facility ... is identified for acquisition in the short-term plan of action... approved or acknowledged by a ... governmental body that makes or implements energy policy...". OAR 345-023-0020(2) states that the Council shall find that a least-cost plan meets the criteria of an energy resource plan described in section (1) if the PUC of Oregon has acknowledged the least cost plan."</p> <p>ODOE does not agree with IPC that the PUC acknowledgement of the 2013 and 2015 IRPs, which include only ongoing permitting, planning, and regulatory filings related to B2H (and not "development" as understood to include both planning/permitting and construction), constitute PUC acknowledgment of B2H "acquisition" under OAR 345-023-0020(1). As such, based on current information in the record, ODOE would not recommend compliance with the Council's Need Standard under OAR 345-023-0020 Least-Cost Plan Rule.</p> <p>However, ODOE understands that in its 2017 IRP, IPC has specifically requested the PUC acknowledge the planning/permitting and construction of B2H. If PUC acknowledges the 2017 IRP including the permitting and construction of B2H, under OAR 345-023-0020, ODOE would recommend that Council shall find compliance with the Need Standard.</p>	<p>Currently, Idaho Power expects the OPUC to issue its acknowledgement order before the DPO is issued. Even so, Idaho Power would like to note that Idaho Power is seeking to meet the Need Standard alternatively under the Least Cost Plan Rule and the System Reliability Rule. Accordingly, the timing and outcome of the OPUC proceedings may not be determinative of whether the Need Standard is met, provided Idaho Power satisfies the System Reliability Rule.</p>

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			<p>ODOE understands that the PUC may not take action on the 2017 IRP until sometime later in 2018. ODOE will not require IPC to include the PUC's acknowledgment of the 2017 IRP in a complete application for site certificate. However, if IPC wishes to rely upon a PUC acknowledgment (if issued for both permitting and construction of B2H) to meet the Need Standard under OAR 345-023-0020 Least Cost Plan Rule, the PUC's acknowledgement must be part of the ODOE record prior to issuance of a DPO.</p>	
ApASC RAIN-2	Exhibit N - throughout	OAR 345-021-0010(1)(n)	<p>Please update Exhibit N as appropriate to reference IPC's 2017 IRP. For example, Exhibit N Section 3.3.2.2 references IPC's 2015 IRP load-resource balance tables, including specific page references in the 2015 IRP. Please update these references to the 2017 IRP. As another example, Exhibit N Section 3.3.5 references that the "preferred resource portfolio in the 2015 IRP contemplates ceasing coal-fired operations for Valmy Units 1 and 2 in 2025," however, in the 2017 IRP, it is stated that IPC will cease coal-fired operations at Valmy Unit 1 by 2019 and Unit 2 by 2025. Table N-1 includes expected-case portfolio costs, from the 2015 IRP.</p> <p>Please also include the 2017 IRP as an attachment to the exhibit. Please note that if IPC is not relying upon previous year's IRPs, these documents do not need to be included in the complete application. OAR 345-021-0010(1)(n)(B)(i) only requires the inclusion of the "energy resource plan or combination of plans which the applicant relies to demonstrate need," meaning, if IPC only relies upon the 2017 IRP, that is the only document that needs to be included in the application.</p>	<p>Idaho Power has updated the information in Exhibit N to incorporate the latest information from the 2017 IRP, including updating Section 3.2.2.2, Section 3.3.5, the North Valmy closure references, Table N-1, and other relevant information.</p> <p>The 2017 IRP is attached as Attachment N-5. Additionally, while Idaho Power appreciates ODOE's suggestion that the company remove the pre-2017 IRPs from the application, Idaho Power believes those IRPs support the need for the Project, even if only as background and context for the Need Standard determination. Therefore, Idaho Power has left those IRPs in the application.</p>
ApASC RAIN-3	Section 3.3.6, Page N-15	OAR 345-021-0010(1)(n)(F)(vi)	<p>This section states that the NERC TPL and WECC rating processes were both used to demonstrate reliability compliance and regional performance criteria. Please provide reference to a document or report from IPC, NERC, WECC, or some other entity that documents the results of these planning studies.</p>	<p>The WECC process discussed in Exhibit N is a process whereby a utility proposes an increase to a certain transmission path, showing that the proposed increase would be achieved without violations of applicable NERC/WECC standards and local reliability criteria. With respect to B2H, WECC approved Idaho Power's proposal for B2H in 2012. Idaho Power added Footnote 27 to Exhibit N referencing that approval:</p>

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			<p>While this section states that with the B2H project, IPC demonstrates compliance with NERC and WECC criteria, it does not state that without B2H, IPC does not meet compliance with the same standards. Could IPC meet the NERC and WECC standards without B2H?</p>	<p>See WECC Memorandum re: Hemingway-Boardman 500 kV Transmission Project Achieves Phase 3 Status (Nov. 27, 2012).</p> <p>B2H is not the only possible solution to meeting Idaho Power's growing demand for electricity in compliance with NERC and WECC reliability standards. However, Idaho Power would have to meet load growth demands through some alternative. Idaho Power has determined, over the course of many successive IRPs, that the B2H project is the least-cost, least-risk resource—as compared to many other alternatives—to meet the company's growing demands.</p>
ApASC RAIN-4	Section 3.2.8, Page N-18-19	OAR 345-021-0010(1)(n)(F)(vii)(IV)	<p>It is stated that the 2011 IRP included an analysis for the cost-effectiveness of the 500 kV single circuit design. Has this analysis been reviewed and reassessed in the 2017 IRP?</p>	<p>Yes, the 2017 IRP evaluated the B2H project against other feasible resource options and determined B2H was the least cost, lowest risk resource to meet the future needs of Idaho Power's customers. Chapter 9 of the 2017 IRP, beginning on page 109, presents an explanation of the analysis and a summary of the results. Further, Appendix D of the 2017 IRP provides a comprehensive review of the Project as a resource, including addressing the need for the Project, discussing (qualitatively and quantitatively) the benefits of the Project, and considering the risks and benefits of the Project in contrast to a traditional generation source. Of particular relevance, Table 2 in Appendix D provides a high-level explanation of the differences between the Project and other resource options, and Appendix D-1 provides comparisons among different transmission line construction and upgrade scenarios (e.g., replacing Oxbow-Lolo 230-kV line with a 500-kV line).</p>

B2HAPPDoc ApASC Exhibit X - Idaho Power's Responses to ODOE's RAI-4 2017-11-06

Idaho Power's Response to ODOE's Request for Additional Information 4
Exhibit X – Noise
Boardman to Hemingway Transmission Line Project
December 2017

Request for Information	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
RAI-4-X ¹	General Comment		<p>IPC has requested Council approval of both an exception and a variance for the proposed facility in its entirety, not only at the 30 identified NSRs with expected noise exceedances. ODOE will assess and make recommendations to Council regarding the requested exception and variance on each NSR or groupings of NSRs, and will not recommend to Council an exception and/or variance for the proposed facility in its entirety. This is based on two factors: 1) IPC does not need an exception/variance for the proposed facility in its entirety, only at the identified NSRs that are expected to exceed the noise standard, and 2) ODOE believes that the assessment of an exception/variance should be site-specific and based on local factors and conditions. For example, based on the weather data provided in Exhibit X, the foul weather conditions vary considerably between the weather stations and regions, and as such, the assessment of an exception request which relies upon infrequent circumstances of the event, will also vary. Additionally, the request for variance should be based on site-specific conditions at any particular NSR or NSR grouping with similar, site-specific circumstances. For example, IPC states that "...the only cure for an exceedance at a particular NSR is to reroute the line away from the NSR. Unfortunately, IPC's analysis reveals that such rerouting is not possible." (ApASC, Exh X, Page X-38). This blanket statement is not validated by the information currently included in Exhibit X. The analysis should instead be site-specific to demonstrate that avoiding the NSR exceedance is in fact not possible. For example, it may be the case that the exceedance at NSR-113 is impossible to avoid because the proposed route must stay within the designated energy corridor. On the contrary, at NSR-115, no other constraints appear on figure X-10 that seem to be obvious constraints on the routing in this area. It is also not obvious why the Willow Creek area, which contains multiple NSRs, could not be avoided. IPC explains on page X-29 that the BLM would not allow an alternative segment in this area to cross its land due to sage grouse considerations. ODOE does not question that trade-off</p>	<p>See attached correspondence from Mark Stokes, Idaho Power, to Kellen Tardaewether, ODOE, discussing certain issues raised by this comment.</p> <p>Additionally, as requested by ODOE, Idaho Power has expanded in the text of Exhibit X the discussion of the siting constraints surrounding NSR-115, the Willow Creek area, and NSR-8 through NSR-11.</p>

¹ ODOE provided its Exhibit X Requests for Information 4 (RAI-4) to Idaho Power on or about October 19, 2017.

Idaho Power's Response to ODOE's Request for Additional Information 4
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December 2017

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			<p>and understands that BLM has control over use of its land, but the decision to cross the Willow Creek valley as shown on figure X-7 is not on BLM land, and it is not clearly demonstrated why the line could not be moved to elsewhere on non-BLM land in this area to avoid the noise exceedance at multiple NSRs. Finally, IPC relies upon a general list of legal constraints (page X-37), including federal land management authority, WECC requirements, Category 1 habitat avoidance, and Protected Areas avoidance, but it is not evident that any of these constraints are at issue around NSRs 8-11 (figure X-5).</p> <p>As such, please provide an assessment of the request for exception and/or variance for each NSR or NSR grouping, as appropriate (groupings as identified on figures X-5 to X-10).</p>	
RAI4-X ²	Section 3.4.5.2, Page X-22, table X-6	OAR 340-035-0010	<p>Table X-6, and the corresponding assessment of foul weather conditions, defines "foul weather" as periods when rainfall is between .8 mm/hr and 5 mm/hr. Please explain why this range was selected. Are there periods when rainfall would be greater than 5 mm/hr? Is that not considered foul weather?</p>	<p>As reviewed and approved by ODOE, Idaho Power used the Bonneville Power Administration's Corona and Field Effects (CAFE) program to analyze audible noise generated from the transmission lines. That method calculates the foul weather L50 noise level during rainy conditions of 1 millimeter per hour (mm/hr) (0.039 inch/hr). Long-term measurements show that L50 audible noise levels occur at this rain rate (EPRI 2005). The CAFE program assumes this standard rain rate, and does not allow for adjustments or modifications. However, as the analysis progressed, Idaho Power recognized that audible noise may be present from the conductors when there are water droplets on the conductors, such as just after rain (conductor not yet dried off) or a light mist or heavy fog although these latter conditions are highly variable. The rain rate of 1 mm/hour used in the CAFE model does not necessarily cover light rains or fog when corona noise will also be generated. Therefore, the Project assumed foul weather to be a rain rate of ranging from 0.8 to 5 mm/hour for the following reasons:</p> <ul style="list-style-type: none"> • It is a slightly more conservative definition of the weather conditions likely to result in maximum corona noise than the 1 mm/hour used by the CAFE program, but is consistent with EPRI

² Idaho Power retained in this document the numbering used by ODOE in its RAI worksheet, which included two RAI "X"s and no RAI "1."

Idaho Power's Response to ODOE's Request for Additional Information 4
Exhibit X – Noise
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Request for Information	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				<p>guidance and further confirmed during Idaho Power's field verification measurements.</p> <ul style="list-style-type: none"> It also correctly excludes precipitation heavy enough that it could be reasonably expected that the noise from the weather would increase ambient sound levels to the extent that the corona noise would be masked. <p>It is assumed that precipitation at a higher rate than 5 mm/hour would result in masking of corona noise.</p>
RAI-4-X	Section 3.3.2.1		Reiteration of RAI 3-X-12: please provide the two referenced BPA documents related to the noise policy compliance or a link where the referenced documents can be accessed (footnotes 8 and 9 of Exhibit X).	See attached.
RAI-4-X-2	Section 3.4.2, Page X-15	OAR 340-035-0035(5)	Please provide any regulations, approval criteria or conditions of operation related to noise that will apply, or are expected to be applied, to the helicopter operations during construction as imposed by the FAA.	<p>Idaho Power has added the relevant Code of Federal Regulations citation to Exhibit X, Section 3.4.2—i.e., 14 C.F.R. § 36.11, which provides for noise certification standards and noise level limits applicable to helicopters. To ensure compliance with such standards, Idaho Power has added the following requirement to Public Services Condition 2: “all helicopters must be compliant with the noise certification and noise level limits set forth in 14 C.F.R. § 36.11.” Further, Public Services Condition 2 already includes the following requirements to avoid or minimize the noise impacts on the public by limiting the location of the helicopter flights to areas away from dwellings and by limiting the timing of the flights to daylight hours: “d. Multi-use areas and light-duty fly yards containing helipads shall be located: . . . (iii) at least 500 feet from existing dwellings on adjacent properties; and e. Flights shall occur only between sunrise and sunset.” In its entirety, Public Services Condition 2, as revised, reads:</p> <p>Public Services Condition 2: Prior to construction, the site certificate holder shall submit to the department for its approval a Helicopter Use Plan, which identifies or provides:</p> <p>a. The type of helicopters to be used (all helicopters must be compliant with the noise</p>

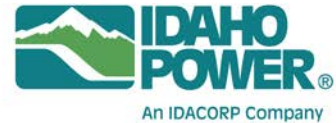
Idaho Power's Response to ODOE's Request for Additional Information 4
Exhibit X – Noise
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December 2017

Request for Information	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				<p>certification and noise level limits set forth in 14 C.F.R. § 36.11);</p> <p>b. The duration of helicopter use;</p> <p>c. Roads or residences over which external loads will be carried;</p> <p>d. Multi-use areas and light-duty fly yards containing helipads shall be located: (i) in areas free from tall agricultural crops and livestock; (ii) at least 500 feet from organic agricultural operations; and (iii) at least 500 feet from existing dwellings on adjacent properties; and</p> <p>e. Flights shall occur only between sunrise and sunset.</p>
RAI-4-X-3	Section 3.4.3, Page X-15	OAR 340-035-0035(5)	Please discuss the expected frequency of use and any proposed conditions of use of helicopters during facility operation.	Response pending.
RAI-4-X-4	Attachment X-4	OAR 340-035-0035	In Attachment X-4, is the predicted sound level shown in L1, L10 or L50 dBA? Please discuss how the facility complies with the entirety of the standard for new noise sources at night: L50, 50 dBA; L10, 55 dBA; and L1, 60 dBA.	The noise modelling methods developed by BPA provides predicted foul weather L50 and L5 sound levels. The model predicts that the L5 sound level is always 3.5 dBA greater than the L50 sound level. Thus, if the predicted L50 sound level is 50 dBA, the predicted L5 will be 53.5 dBA. The L5 represents the loudest 5-percent of an hour (3 minutes of an hour) while the L10 represents the loudest 10% of an hour (6 minutes of an hour). The L10 is therefore always less than or equal to the L5 and if the L5 complies with 55 dBA, the L10 will also comply with 55 dBA. The BPA model does not provide a method to calculate the L1 sound level, but it is not expected that the L1 will exceed the L5 by more than 6 dBA nor the L50 by more than 10 dBA; thus compliance with the L50 of 50 dBA criteria is anticipated to also yield compliance with the L10 criteria of 55 dBA and the L1 criteria of 60 dBA.
RAI-4-5	Section 3.4.5.2, Page X-18	OAR 340-035-0035(1)(b)(B)(i)	The discussion of Table X-5 and the anticipated 30 NSR noise exceedances references a late-night time period of midnight to 5 AM when exceedances may occur, during foul weather conditions. However, the L50 dBA nighttime noise standard applies between 10 PM and 7 AM. Please explain if the difference in time between the standard and what IPC appears to have	The midnight-5am timeframe appears to have come at the request of ODOE or ODOE's consultant over objections by Idaho Power. If we use the 10pm-7am timeframe instead, Idaho Power would expect that the existing baseline noise levels would be higher because the additional hours would capture more activity such as car noise and other actions that generate noise.

Idaho Power's Response to ODOE's Request for Additional Information 4
Exhibit X – Noise
Boardman to Hemingway Transmission Line Project
December 2017

Request for Information	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
			analyzed result in a different outcome than what is reported in Exh. X.	
RAI-4-6	Section 3.4.5.2, Page X-19	OAR 340-035-0035(1)(b)(B)(i)	Table X-5 is reported in L50 dBA. However, the noise standard also considers standards for L1 and L10 dBA. Please explain if there is a difference in results from the analysis using L50 and an analysis using L1 or L10.	See response to RAI-4-X-4 above.
RAI-4-7	Figure X-5-X-10	OAR 345-021-0010(1)(x)	A number of NSRs from Table X-5 do not appear on Figures X-5 to X-10. Specifically these are NSRs: 71, 93, 95, 101, 102, and 104. Please add these to the maps or explain why they are not shown on the maps.	Idaho Power has added NSR-71, -93, -95, -102, -102, and -104 where missing.

November 2, 2017
Memorandum from Idaho
Power to ODOE Regarding
Noise Control Regulation
Exception and Variance
Requests



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November 2, 2017

Via Electronic Mail

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Re: Noise Control Regulations and Exhibit X
Boardman to Hemingway Transmission Line Project

Dear Ms. Tardaewether:

In ODOE's October 19, 2017 Requests for Information #4 related to Exhibit X, ODOE included a cover page with general comments discussing the exception and variance processes under the Oregon Department of Environmental Quality's Noise Control Regulations as they relate to the Boardman to Hemingway Transmission Line Project. I am writing in response to that discussion, providing additional information and context for Idaho Power's exception and variance request.

I. The Requested Exception and Variance Should Apply to the Project as a Whole.

ODOE stated that it "will assess and make recommendations to Council regarding the requested exception and variance on each NSR [noise sensitive receptor] or groupings of NSRs, and will not recommend to Council an exception and/or variance for the proposed facility in its entirety." Idaho Power disagrees with ODOE's statement that Idaho Power must obtain separate exceptions or variances for each NSR expected to exceed the regulatory limits and not for the Project as a whole. The Noise Control Regulations regulate "noise sources" and not NSRs as the basis for compliance or for exceptions and variances. ODOE, on the other hand, appears to be treating each NSR as if it is being affected by separate noise sources. That, however, is not how the

Noise Control Regulations are applied. There is a single noise source here and an exceedance along that single noise source, at any point and regardless of where along that noise source the exceedance appears, prompts the need for either an exception or a variance. And in turn, an exception or variance will apply to the Project as a whole and not just to certain NSR locations. For example, OAR 340-035-0100(1) states that a variance may be granted to “such specific noise source” as necessary, meaning the variance isn’t intended to apply at just certain locations or for certain NSR exceedances; it’s intended to apply to the entire project. That being so, here, an exception or variance for the Project should be granted to the Project in its entirety and not just for specific NSR locations. This distinction is important, not only for explaining the scope of the exception or variance, but also for framing the context for the exception and variance evaluation, as explained below.

II. ODOE Should Evaluate the Exception and Variance Requests Separately.

ODOE’s comments addressed site-specific conditions surrounding certain NSR exceedances, but the comments did not identify whether that discussion applied to the exception analysis, the variance analysis, or both analyses. Idaho Power requests that ODOE provide a more-detailed response that addresses the exception and variance requests separately and that frames those comments in the context of the specific factors set forth in the exception and variance regulations.

III. The Foul Weather Events Potentially Causing Exceedances of the Ambient Antidegradation Standard Will Be Infrequent, Justifying an Exception.

OAR 340-035-0035(6) provides that an owner of an industrial noise source—such as B2H—may receive an exception to the regulatory noise levels for “unusual and/or infrequent events.” In this instance, Idaho Power shows that, while corona noise from the transmission line may exceed the ambient antidegradation standard at certain NSRs during certain foul weather events, the relevant foul weather events are predicted to occur only 1.3 percent of the time each year. The Noise Control Regulations do not define the term “infrequent” for purposes of the exception. However, the common meaning of that term is “seldom happening or occurring,” or “placed or occurring at wide intervals in space or time.”¹ Because the potential exceedances are anticipated to occur only 1.3 percent of the time, they certainly should be considered as “seldom happening” and therefore should be considered infrequent events for purposes of the exception. ODOE’s comments do not appear to challenge that the exceedances will be “infrequent,” and therefore, an exception is warranted.

ODOE states that it “believes that the assessment of an exception/variance should be site-specific and based on local factors and conditions,” and “the foul weather conditions vary considerably between the weather stations and regions, and as such, the assessment of an exception request which relies upon infrequent circumstances of the event, will also vary.” Here, Idaho Power believes that Exhibit X sufficiently discusses the local weather conditions affecting the NSR exceedance locations. And ODOE’s comments do not mention any specific site-specific weather information that is missing from Exhibit X. That being so, again, Exhibit X provides sufficient information justifying an exception.

¹ Merriam-Webster Online Dictionary at <https://www.merriam-webster.com/dictionary/infrequent>.

To the extent ODOE suggests that in order to receive an exception Idaho Power must show that avoiding the exceedance NSRs is impossible, OAR 340-035-0035(6) does not require such a showing. Rather, that provision only requires a showing that the exceedance is due to an unusual or infrequent event. And in this case, Exhibit X clearly makes that showing, where the foul weather events that potentially will cause an exceedance are predicted to occur only 1.3 percent of the time. While ODOE's basis for its alternative routing analysis requirement is unclear from its October 19 comments, to the extent ODOE is relying on OAR 340-035-0035(6), ODOE should provide a more-detailed explanation of how it interpreted that rule as requiring an alternatives analysis.

If ODOE is relying on OAR 340-035-0010(2) and not OAR 340-035-0035(6), it must be clarified that the factors set forth in that subsection do not expressly include any alternative siting analysis. If ODOE is relying on OAR 340-035-0010(2), ODOE should explain in more detail how it determined that that provision contemplates an alternative siting analysis.

Additionally, and perhaps more importantly, OAR 340-035-0010(2) provides that the listed factors only need be "considered." OAR 340-035-0010(2) does not state that the factors are "requirements." ODOE should explain how an alternative siting analysis is a requirement and not just a consideration under OAR 340-035-0010(2). Also, to the extent ODOE is relying on OAR 340-035-0010(2), ODOE must consider each of the factors listed in that subsection and not just its alternative siting analysis. When all the factors are considered, the totality of the circumstances (even if ODOE's alternative siting analysis is taken into consideration) weighs heavily in favor of an exception, given that there are relatively few affected NSRs given the size of the Project (nearly 300-miles long), that the few affected NSRs are expected to experience exceedances only 1.3 percent of the time and then only during foul weather events when the occupants are likely to be inside buildings where the sound will be buffered, that Idaho Power is offering to fund window treatments to further buffer the sound inside the affected NSR buildings, that there were numerous competing siting constraints that drove the location of the Project, and that the quantity of noise generated is still expected in all instances to be below the 50 dBA maximum permissible limit. Finally, ODOE's analysis under OAR 340-035-0010(2) should consider the fact that the State of Oregon has defunded the noise program and the Oregon Department of Environmental Quality—the agency charged with administering and enforcing the Noise Control Regulations—has by rule suspended administration of the noise program:

In 1991, the Legislative Assembly withdrew all funding for implementing and administering ORS Chapter 467 and the Department's noise program.

Accordingly, the Commission and the Department have suspended administration of the noise program, including but not limited to processing requests for exceptions and variances, reviewing plans, issuing certifications, forming advisory committees, and responding to complaints. Similarly, the public's obligations to submit plans or certifications to the Department are suspended.

OAR 340-035-0110. While Idaho Power understands ODOE believes it must still consider the Noise Control Regulations because of EFSC's rules, ODOE's analysis under OAR 340-035-0010(2) should recognize that the Legislative Assembly and ODEQ no longer fund or implement the noise program, suggesting that they do not view the Noise Control Regulations—let alone strict compliance with the ambient antidegradation standard—as being critical to "health, safety,

and welfare of Oregon citizens” under OAR 340-035-0010(2). For all of the above reasons, Exhibit X provides sufficient information justifying an exception.

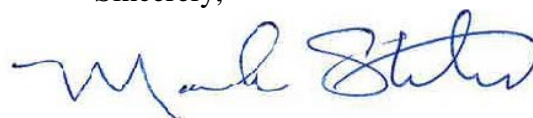
IV. A Variance Requires a Showing of Special Considerations Making Compliance Unreasonable or Special Physical Conditions Making Compliance Impractical; There Is No Impossibility Test.

ODOE states that, in order to get a variance, Idaho Power must show that “avoiding the NSR exceedance is in fact not possible.” Idaho Power disagrees with ODOE’s interpretation of the rule. First, the relevant thresholds under OAR 340-035-0100(1) are whether strict compliance is “unreasonable” or “impractical,” both of which thresholds are lower than ODOE’s “impossible” threshold. Second, there is no siting-avoidance test under OAR 340-035-0100(1). Instead, that provision requires only that the person seeking a variance show it is unreasonable or impractical for the noise source to strictly comply with the noise rules, given special considerations or special physical conditions. OAR 340-035-0100(1) states that a variance is warranted if strict compliance is inappropriate “because of special circumstances which render strict compliance unreasonable, or impractical due to special physical conditions or cause” OAR 340-035-0100(1). Here, the foul weather events are the “special circumstances” or “special physical conditions” affecting strict compliance. The foul weather events are special because they will occur only infrequently and they uniquely cause corona noise on transmission lines (and not on most, if any, other facilities). The foul weather events render strict compliance unreasonable or impractical because Idaho Power cannot control those foul weather events, the cause of the non-compliance. The focus of the variance analysis is on the reasonableness or practicality of Project’s ability to comply with the noise rules, given the special weather events. In this case, it’s not reasonable or practical to expect the Project to meet the antidegradation standard, given that the certain foul weather events are expected to occur (if only infrequently) and Idaho Power cannot control the weather.

V. Conclusion

Idaho Power appreciates ODOE’s comments on Exhibit X of the June 2017 Amended Preliminary Application for Site Certificate. Idaho Power believes the additional information and explanation provided in this correspondence confirms that the Project warrants an exception, variance, or both to account for the projected exceedances of the ambient antidegradation standard caused by certain infrequent foul weather events. If you have any additional comments or questions regarding these issues, please do not hesitate to call or write.

Sincerely,



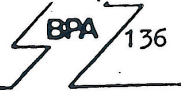
Mark Stokes
Engineering Project Leader

cc: Max Woods, Maxwell.Woods@oregon.gov

May 26, 1982 Bonneville
Power Administration
Memorandum on Sound Level
Limits for BPA Facilities

Idaho Power Administration
Department of Energy

APPENDIX 954-E



UNITED STATES GOVERNMENT

Memorandum

MAY 26 1982

EOH

TO : Marvin Klinger, Assistant Administrator
for Engineering and Construction - E

FROM : Dean Perry, Director
Division of System Engineering - ED *Dean Perry*

SUBJECT: Sound Level Limits for BPA Facilities

The Noise Control Act of 1972 gave the States the responsibility for noise control. Executive Order No. 12088 requires that all Federal agencies comply with these State and local noise control regulations.

Noise control regulations differ greatly from state to state. Even cities and counties can enact noise control regulations. This means that a single transmission line may be under several different regulations along its length.

Noise regulations are also subject to change. These changes rarely include provisions for "grandfathering" existing facilities. Existing facilities can be forced into violation by the regulation change or the development of noise-sensitive property adjacent to the facility.

Therefore, in 1978, BPA established the Interim Sound Level Limits for Transmission Lines (Schaufelberger to Gens, 3/30/78) to provide guidelines until interpretations of State regulations, as they apply to BPA facilities, could be made.

Based on the results of our review and the interpretations reached with the Oregon State Department of Environmental Quality and the Washington State Department of Ecology, we recommend the following, in lieu of the Interim Sound Level Limits established in 1978:

Lands Controlled by State or Local Noise Regulations

BPA will meet State and local noise control regulations.

It is BPA's interpretation that a frequency of occurrence of less than 1 percent will qualify as an exception to the regulations. For a-c transmission lines located in areas where a rain rate from 0.8 to 5mm/hr will occur less than 1 percent of the time during the year, audible noise from the line will be an infrequent event and thus be considered as an exception from noise regulations. Based on a meteorological analysis of the frequency of these rain rates (0.8 - 5mm/hr), a-c transmission lines east of the Cascades will meet this criteria.

In all other areas of the system, new, rebuilt or uprated transmission lines shall be designed to meet an L50 level of 50 dB(A) at the edge of

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the right-of-way. This level shall be determined within a ± 2 dB(A) tolerance at 98 percent of maximum system voltage and a rain rate of 1mm/hr.

Other new BPA facilities, and the additions to existing facilities, shall be designed to comply with state and local noise control regulations in force at the location. Transformer noise shall be evaluated at 100 percent rated voltage, with all cooling in service.

- * With regard to existing facilities, BPA will continue to follow the procedures for handling noise-related complaints associated with BPA facilities as approved by the Administrator on July 7, 1978 (Memorandum from R. S. Gens and J. N. O'Neal to Sterling Munro, dated July 3, 1978). No program level effort is required until after receiving a validated complaint or notice of violation.

Lands Not Controlled by State or Local Noise Regulations and Lands without Noise Sensitive Property

In locations not controlled by State or local noise regulations, or where noise-sensitive property cannot be developed, the design noise levels will consider EPA guidelines, latest psychoacoustic research, probability of exposure and sound engineering economic practice.

When compliance with the above is not reasonable for design of a new facility, alternatives may be investigated with the approval of the Assistant Administrator for Engineering and Construction.

2 Attachments:

Memo dated July 3, 1978

Additional Interpretations of State Regulations

APPROVED: *William J. ...*

DATE: 6/1/82

- * The procedures discussed in the July 7, 1978 memorandum have been incorporated into the Noise Control procedures, section 954.8.

North Steens Transmission Line
Project, Final EIS, Appendix C
(October 2011)

APPENDIX C

North Steens EMF Report

NORTH STEENS TRANSMISSION LINE PROJECT

APPENDIX C
ELECTRICAL EFFECTS

FEBRUARY 2010

DRAFT

Prepared by
T. Dan Bracken, Inc.

For the
Bonneville Power Administration

And
ENTRIX

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ELECTRICAL EFFECTS FROM THE NORTH STEENS TRANSMISSION LINE PROJECT

1.0 Introduction

The Echanis Wind Energy Project is proposing to build an approximately 12-mile (mi.) (19.3-kilometer [km]) 230-kilovolt (kV) double-circuit transmission line in Harney County, Oregon from the proposed Echanis Wind Energy Project substation to an interconnection station adjacent to an existing Harney Electric Cooperative 115-kV transmission line. The proposed line is designated the North Steens transmission line. It would be built on new right-of-way entirely within the state of Oregon. Initially the line would be operated at 115-kV. Successive phases of the project would see one side of the line energized at 230 kV and then the other.

The purpose of this report is to describe and quantify the electrical effects of all potential phases of the proposed North Steens transmission line project. These effects include the following:

- the levels of 60-hertz (Hz; cycles per second) electric and magnetic fields (EMF) at 3.28 feet (ft.) or 1 meter (m) above the ground,
- the effects associated with those fields,
- the levels of audible noise produced by the line, and
- electromagnetic interference associated with the line.

Electrical effects occur near all transmission lines, including existing 115- and 230-kV lines in Oregon. Levels of these quantities for the proposed line are computed and compared with those from existing lines in Oregon.

The line would be constructed on double-circuit steel-pole towers. Initially, a single circuit (three conductors) will be installed on one side of the tower (Phase I). Future plans call for a second line operating at 230 kV to be placed on the other side of the tower (Phase II). Finally, the Phase I 115-kV line could be upgraded to 230-kV operation (Phase III). Implementation of Phases II and III would be contingent on the upgrade of existing transmission lines in the area to 230-kV operation.

Two alternative routes are being considered for the proposed line – the West Route and the North Route. Both of these routes would entail construction on new right-of-way with no existing parallel high-voltage transmission lines. For the purposes of assessing electrical effects, both routing alternatives are equivalent, since the line design and operating characteristics would be the same for both. Thus, the three configurations of interest for this report are the proposed line design with the operational characteristics of Phases I, II and III. There are no electrical effects associated with the no-action (no-build) alternative that can be compared with the action of constructing the proposed transmission line.

The voltage on the conductors of transmission lines generates an *electric field* in the space between the conductors and the ground. The electric field is calculated or measured in units of volts-per-meter (V/m) or kilovolts-per-meter (kV/m) at a height of 3.28 ft. (1 m) above the ground. The electric current flowing in the conductors of the transmission line generates a *magnetic field* in the air and earth near the transmission line; current is expressed in units of amperes (A). The magnetic field is expressed in milligauss (mG), and is also usually measured or calculated at a height of 3.28 ft. (1 m) above the ground. The relatively high electric field at the surface of the conductors causes the phenomenon of *corona*.

North Steens Transmission Line Project
Appendix C: Electrical Effects

Corona is the electrical breakdown or ionization of air in very strong electric fields, and is the source of audible noise, electromagnetic radiation, and sometimes visible light.

To quantify EMF levels along the route, the electric and magnetic fields from the proposed transmission line were calculated using the BPA Corona and Field Effects Program (USDOE, undated). In this program, the calculation of 60-Hz fields uses standard superposition techniques for vector fields from several line sources: in this case, the line sources are transmission-line conductors. (Vector fields have both magnitude and direction: these must be taken into account when combining fields from different sources.) Important input parameters to the computer program are voltage, current, and geometric configuration of the line. The transmission-line conductors are assumed to be straight, parallel to each other, and located above and parallel to an infinite flat ground plane. Although such conditions do not occur under real lines because of conductor sag and variable terrain, the validity and limitations of calculations using these assumptions have been well verified by comparisons with measurements. This approach was used to estimate fields for the proposed North Steens line, where minimum clearances were assumed to provide worst-case (highest) estimates for the fields.

Electric fields are calculated using an imaging method. Fields from the conductors and their images in the ground plane are superimposed with the proper magnitude and phase to produce the total field at a selected location.

The total magnetic field is calculated from the vector summation of the fields from currents in all the transmission-line conductors. Balanced (equal) currents are assumed for each three-phase circuit; the contribution of induced image currents in the conductive earth is not included. Estimates of peak and average currents were estimated by the Echanis Wind Energy Project engineering team for years when the various phases of the project would be operational.

Electric and magnetic fields for the proposed line were calculated at the standard height (3.28 ft. or 1 m) above the ground (IEEE, 1994). Calculations were performed out to 300 ft. (91 m) from the centerline of the existing corridor. The validity and limitations of such calculations have been well verified by measurements. Because maximum voltage, maximum current, and minimum conductor height above-ground are used, **the calculated maximum or peak values given here represent worst-case conditions:** i.e., the calculated fields are higher than they would be in practice. Such worst-case conditions would seldom occur. Fields were also calculated for more typical or average conditions of average clearance along a span, average voltage and average current to characterize the fields expected along the entire line over a year.

The corona performance of the proposed line was also predicted using the BPA Corona and Field Effects Program (USDOE, undated). Corona performance is calculated using empirical equations that have been developed over several years from the results of measurements on numerous high-voltage lines (Chartier and Stearns, 1981; Chartier, 1983). The validity of this approach for corona-generated audible noise has been demonstrated through comparisons with measurements on other lines all over the United States (IEEE Committee Report, 1982). The accuracy of this method for predicting corona-generated radio and television interference from transmission lines has also been established (Olsen et al., 1992). Important input parameters to the computer program are voltage, current, conductor size, and geometric configuration of the line.

Corona is a highly variable phenomenon that depends on conditions along a length of line. Predictions of the levels of corona effects are reported in statistical terms to account for this variability. Calculations of audible noise and electromagnetic interference levels were made under conditions of an estimated

*North Steens Transmission Line Project
Appendix C: Electrical Effects*

average operating voltages of 121.7 and 241.5 kV and with the average line height along a span of 38.4 ft. (11.7 m).

Levels of audible noise, radio interference, and television interference are predicted for both fair and foul weather; however, corona is basically a foul-weather phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. In the Harney County area of the proposed route, such conditions are expected to occur about 7% of the time during a year based on hourly precipitation records from Burns, Oregon during 2006 – 2008 (NOAA, 2010). Corona activity also increases with altitude. For purposes of evaluating corona effects from the proposed line, an altitude of 4500 ft. (1370 m) was assumed based on discussions with members of the project engineering team.

Both of the proposed alternative routes will traverse arid pasture and range land that is sparsely populated. With the exception of five residences along the North Route, all residences will be greater than 550 feet (170 m) from the line. The closest residences along the North Route are 75, 200, and 400 feet (23, 60, and 122 m) from the line, with three houses at the 200-foot distance.

2.0 Physical Description

2.1 Proposed Line

Initially, the proposed transmission line would be a three-phase, single-circuit line placed on mostly tubular steel double-circuit structures (Figure 1). At some locations where the line(s) change direction, the conductors for each line would be placed on separate single poles (Figure 2). The field and corona effects at these points would be very similar to those near the double circuit towers. Only the effects from the double circuit tower configurations are presented here.

The double-circuit towers would have two sets of three phases arranged vertically on either side of the structure. Each set of phase wires comprises a circuit. Voltage and current waves are displaced by 120° in time (one-third of a cycle) on each electrical phase. The maximum phase-to-phase voltage would be 121.7 kV for the 115-kV circuit and 241.5 for the 230-kV circuits. These maximum values were also assumed to be the average voltages, since estimates of the average voltage were not available.

Initially the single 115-kV line would carry the electrical output load from Phase I of the project. The peak load for this condition would be 104 megawatts (MW), corresponding to 500 A for 115-kV operation. The Phase II 230-kV line would carry a projected peak load of 416 MW from future expansion of the Echanis Wind Energy Project. This load would correspond to a peak current of 1000 A for 230-kV operation. Upgrading the initial 115-kV circuit to 230-kV (Phase III) would decrease the peak current on that circuit to 261 A.

The projected load factor for the North Steens Transmission Line Project is 0.35 (average load = peak load x load factor). Thus, the average currents on each circuit would be 35 percent of the maximum values. The Echanis engineering team provided the physical and operating characteristics of the proposed line.

The physical dimensions for the proposed double circuit line configuration are shown in Figure 2, and summarized in Table 2. The electrical characteristics of the 115-kV and 230-kV lines in Phases I, II and III are shown in Table 3. Each phase of the proposed lines would have one 1.545-inch (in.) (3.9-centimeter [cm]) diameter conductor.

North Steens Transmission Line Project
Appendix C: Electrical Effects

The horizontal spacing between conductors of the two circuits would be 24.0 ft. (7.3 m). The vertical spacing between the conductor positions would be 16.0 ft. (4.9 m). The spacing between conductor locations would vary slightly where special towers are used, such as at angle points along the line. Short sections of the proposed line where conductor locations would change, such as upon entry to an interconnection station or substation, were not analyzed.

Minimum conductor-to-ground clearance would be 32.25 ft. (9.8 m) at a conductor temperature of 50°C; clearances above ground could be greater under normal operating temperatures. The average clearance above ground along a span would be approximately 38.5 ft. (11.7 m); this value was used for average field and corona calculations. At road crossings, the ground clearance would be at least 32.25 ft. (9.8 m). The final design of the proposed line could entail larger clearances. The right-of-way width for the proposed line would be 150 ft. (45.7 m).

The results reported here for fields and corona effects assume that the electrical phasing of the two circuits would be such as to place different electrical phases on the lower conductors of the two circuits as well as on the upper conductors of each circuit. This phasing configuration tends to minimize the electric and magnetic fields at ground level.

2.2 Existing Lines

The proposed 230-kV line would be built on new right-of-way. There are no existing transmission lines parallel to the proposed routes. Consequently, no existing transmission lines are included in the analysis of electrical effects.

3.0 Electric Field

3.1 Basic Concepts

An electric field is said to exist in a region of space if an electrical charge, at rest in that space, experiences a force of electrical origin (i.e., electric fields cause free charges to move). Electric field is a vector quantity: that is, it has both magnitude and direction. The direction corresponds to the direction that a positive charge would move in the field. Sources of electric fields are unbalanced electrical charges (positive or negative) and time-varying magnetic fields. Transmission lines, distribution lines, house wiring, and appliances generate electric fields in their vicinity because of unbalanced electrical charge on energized conductors. The unbalanced charge is associated with the voltage on the energized system. On the power system in North America, the voltage and charge on the energized conductors are cyclic (plus to minus to plus) at a rate of 60 times per second. This changing voltage results in electric fields near sources that are also time-varying at a frequency of 60 hertz (Hz; a frequency unit equivalent to cycles per second).

As noted earlier, electric fields are expressed in units of volts per meter (V/m) or kilovolts (thousands of volts) per meter (kV/m). Electric- and magnetic-field magnitudes in this report are expressed in root-mean-square (rms) units. For sinusoidal waves, the rms amplitude is given as the peak amplitude divided by the square root of two.

The spatial uniformity of an electric field depends on the source of the field and the distance from that source. On the ground, under a transmission line, the electric field is nearly constant in magnitude and direction over distances of several feet (1 meter). However, close to transmission- or distribution-line conductors, the field decreases rapidly with distance from the conductors. Similarly, near small sources

North Steens Transmission Line Project
Appendix C: Electrical Effects

such as appliances, the field is not uniform and falls off even more rapidly with distance from the device. If an energized conductor (source) is inside a grounded conducting enclosure, then the electric field outside the enclosure is zero, and the source is said to be shielded.

Electric fields interact with the charges in all matter, including living systems. When a conducting object, such as a vehicle or person, is located in a time-varying electric field near a transmission line, the external electric field exerts forces on the charges in the object, and electric fields and currents are induced in the object. If the object is grounded, then the total current induced in the body (the "short-circuit current") flows to earth. The distribution of the currents within, say, the human body, depends on the electrical conductivities of various parts of the body: for example, muscle and blood have higher conductivity than bone and would therefore experience higher currents.

At the boundary surface between air and the conducting object, the field both in the air and perpendicular to the conductor surface is much, much larger than the field in the conductor itself. For example, the average surface field on a human standing in a 10 kV/m field is 27 kV/m; the internal fields in the body are much smaller: approximately 0.008 V/m in the torso and 0.45 V/m in the ankles.

3.2 Transmission-line Electric Fields

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, towers, vegetation, buildings, vehicles, and people. The calculated strength of the electric field at a height of 3.28 ft. (1 m) above an unvegetated, flat earth is frequently used to describe the electric field under straight, parallel transmission lines. The most important transmission-line parameters that determine the electric field at a 1-m height are conductor height above ground and line voltage.

Calculations of electric fields from transmission lines are performed with computer programs based on well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values under these conditions represent an ideal situation. When practical conditions approach this ideal model, measurements and calculations agree. Often, however, conditions are far from ideal because of variable terrain and vegetation. In these cases, fields are calculated for ideal conditions, with the lowest conductor clearances to provide upper bounds on the electric field under the transmission lines. With the use of more complex models or empirical results, it is also possible to account accurately for variations in conductor height, topography, and changes in line direction. Because the fields from different sources add vectorially, it is possible to compute the fields from several different lines if the electrical and geometrical properties of the lines are known. However, in general, electric fields near transmission lines with vegetation below are highly complex and cannot be calculated. Measured fields in such situations are highly variable.

For evaluation of EMF from transmission lines, the fields must be calculated for a specific line condition. The NESC states the condition for evaluating electric-field-induced short-circuit current for lines with voltage above 98 kV, line-to-ground, as follows: conductors are at a minimum clearance from ground corresponding to a conductor temperature of 122°F (50°C), and at a maximum voltage (IEEE, 2002). Echanis has supplied the information for calculating electric and magnetic fields from the proposed transmission line: the maximum operating voltage, the estimated peak currents, and the minimum conductor clearances.

There are standard techniques for measuring transmission-line electric fields (IEEE, 1994). Provided that the conditions at a measurement site closely approximate those of the ideal situation assumed for calculations, measurements of electric fields agree well with the calculated values. If the ideal conditions

North Steens Transmission Line Project
Appendix C: Electrical Effects

are not approximated, the measured field can differ substantially from calculated values. Usually the actual electric field at ground level is reduced from the calculated values by various common objects that act as shields.

Maximum or peak field values occur over a small area at midspan, where conductors are closest to the ground. As the location of an electric-field profile approaches a tower, the conductor clearance increases, and the peak field decreases. A grounded tower will reduce the electric field considerably, by shielding.

For traditional transmission lines, such as the proposed line, where the right-of-way extends laterally well beyond the conductors, electric fields at the edge of the right-of-way are not as sensitive as the peak field to conductor height. Computed values at the edge of the right-of-way for any line height are fairly representative of what can be expected all along the transmission-line corridor. However, the presence of vegetation on and at the edge of the right-of-way will reduce actual electric-field levels below calculated values.

3.3 Calculated Values of Electric Fields

Table 2 shows the calculated maximum and average values of electric field at 3.28 ft. (1 m) above ground for the proposed North Steens transmission lines operated at maximum voltages. The peak value on the right-of-way and the value at the edge of the right-of-way are given for the proposed lines at minimum conductor clearance and at the estimated average clearance over a span. Figure 2 shows lateral profiles for the electric field from the proposed line at the minimum (32.25 ft.) and average (38.4 ft.) line heights.

The calculated peak electric field expected on the right-of-way of the proposed Phase I line is 1.3 kV/m. During Phases II and III, the peak electric fields on the right-of-way will increase to 2.1 and 1.8 kV/m, respectively. For average clearance, the peak field for Phase I would be 1.0 kV/m and for Phases II and III it would be 1.5 kV/m or less. As shown in Figure 2, the peak values would be present only at locations directly under the line, near mid-span, where the conductors are at the minimum clearance. The conditions of minimum conductor clearance at maximum current and maximum voltage occur very infrequently. The calculated peak levels are rarely reached under real-life conditions, because the actual line height is generally above the minimum value used in the computer model, because the actual voltage is below the maximum value used in the model, and because vegetation within and near the edge of the right-of-way tends to shield the field at ground level. Maximum electric fields on existing 230-kV corridors are typically 2.5 to 3 kV/m. On 500-kV transmission line corridors, the maximum electric fields range from 7 to 9 kV/m.

The largest value expected at the edge of the right-of-way with 230-kV operation would be about 0.1 kV/m, occurring for average conductor heights. Fields with the edge of the right-of-way adjacent to a 115-kV line (Phases I and II) are less than this as shown in Table 2 and Figure 2.

3.4 Environmental Electric Fields

The electric fields associated with the North Steens transmission line can be compared with those found in other environments. Sources of 60-Hz electric (and magnetic) fields exist everywhere electricity is used; levels of these fields in the modern environment vary over a wide range. Electric-field levels associated with the use of electrical energy are orders of magnitude greater than naturally occurring 60-Hz fields of about 0.0001 V/m, which stem from atmospheric and extraterrestrial sources.

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Electric fields in outdoor, publicly accessible places range from less than 1 V/m to 12 kV/m; the large fields exist close to high-voltage transmission lines of 230 kV or higher. In remote areas without electrical service, 60-Hz field levels can be much lower than 1 V/m. Electric fields in home and work environments generally are not spatially uniform like those of transmission lines; therefore, care must be taken when making comparisons between fields from different sources such as appliances and electric lines. In addition, fields from all sources can be strongly modified by the presence of conducting objects. However, it is helpful to know the levels of electric fields generated in domestic and office environments in order to compare commonly experienced field levels with those near transmission lines.

Numerous measurements of residential electric fields have been reported for various parts of the United States, Canada, and Europe. Although there have been no large studies of residential electric fields, sufficient data are available to indicate field levels and characteristics. Measurements of domestic 60-Hz electric fields indicate that levels are highly variable and source-dependent. Electric-field levels are not easily predicted because walls and other objects act as shields, because conducting objects perturb the field, and because homes contain numerous localized sources. Internal sources (wiring, fixtures, and appliances) seem to predominate in producing electric fields inside houses. Average measured electric fields in residences are generally in the range of 5 to 20 V/m. In a large occupational exposure monitoring project that included electric-field measurements at homes, average exposures for all groups away from work were generally less than 10 V/m (Bracken, 1990).

Electric fields from household appliances are localized and decrease rapidly with distance from the source. Local electric fields measured at 1 ft. (0.3 m) from small household appliances are typically in the range of 30 to 60 V/m. In a survey, reported by Deno and Zaffanella (1982), field measurements at a 1-ft. (0.3-m) distance from common domestic and workshop sources were found to range from 3 to 70 V/m. The localized fields from appliances are not uniform, and care should be taken in comparing them with transmission-line fields.

Electric blankets can generate higher localized electric fields. Sheppard and Eisenbud (1977) reported fields of 250 V/m at a distance of approximately 1 ft. (0.3 m). Florig et al. (1987) carried out extensive empirical and theoretical analysis of electric-field exposure from electric blankets and presented results in terms of uniform equivalent fields such as those near transmission lines. Depending on what parameter was chosen to represent intensity of exposure and the grounding status of the subject, the equivalent vertical 60-Hz electric-field exposure ranged from 20 to over 3500 V/m. The largest equivalent field corresponds to the measured field on the chest with the blanket-user grounded. The average field on the chest of an ungrounded blanket-user yields an equivalent vertical field of 960 V/m. As manufacturers have become aware of the controversy surrounding EMF exposures, electric blankets have been redesigned to reduce *magnetic* fields. However, electric fields from these "low field" blankets are still comparable with those from older designs (Bassen et al., 1991).

Generally, people in occupations not directly related to high-voltage equipment are exposed to electric fields comparable with those of residential exposures. For example, the average electric field measured in 14 commercial and retail locations in rural Wisconsin and Michigan was 4.8 V/m (ITT Research Institute, 1984). Median electric field was about 3.4 V/m. These values are about one-third the values in residences reported in the same study. Electric-field levels in public buildings such as shops, offices, and malls appear to be comparable with levels in residences.

In a survey of 1,882 volunteers from utilities, electric-field exposures were measured for 2,082 work days and 657 non-work days (Bracken, 1990). Electric-field exposures for occupations other than those directly related to high-voltage equipment were equivalent to those for non-work exposure.

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Thus, except for the relatively few occupations where high-voltage sources are prevalent, electric fields encountered in the workplace are probably similar to those of residential exposures. Even in electric-utility occupations where high field sources are present, exposures to high fields are limited on average to minutes per day.

Electric fields found in publicly accessible areas near high-voltage transmission lines can typically range up to 3 kV/m for 230-kV lines, to 10 kV/m for 500-kV lines, and to 12 kV/m for 765-kV lines. Although these peak levels are considerably higher than the levels found in other public areas, they are present only in limited areas on rights-of-way.

The calculated electric fields for the proposed North Steens transmission line are consistent with the levels reported for other 230-kV transmission lines in Oregon, Washington, and elsewhere. The calculated electric fields on the right-of-way of the proposed transmission line are generally much higher than levels normally encountered in residences and offices.

4.0 Magnetic Field

4.1 Basic Concepts

Magnetic fields can be characterized by the force they exert on a moving charge or on an electrical current. As with the electric field, the magnetic field is a vector quantity characterized by both magnitude and direction. Electrical currents generate magnetic fields. In the case of transmission lines, distribution lines, house wiring, and appliances, the 60-Hz electric current flowing in the conductors generates a time-varying, 60-Hz magnetic field in the vicinity of these sources. The strength of a magnetic field is measured in terms of magnetic lines of force per unit area, or magnetic flux density. The term “magnetic field,” as used here, is synonymous with magnetic flux density and is expressed in units of Gauss (G) or milligauss (mG).

The uniformity of a magnetic field depends on the nature and proximity of the source, just as the uniformity of an electric field does. Transmission-line-generated magnetic fields are quite uniform over horizontal and vertical distances of several feet near the ground. However, for small sources such as appliances, the magnetic field decreases rapidly over distances comparable with the size of the device.

The interaction of a time-varying magnetic field with conducting objects results in induced electric field and currents in the object. A changing magnetic field through an area generates a voltage around any conducting loop enclosing the area (Faraday's law). This is the physical basis for the operation of an electrical transformer. For a time-varying sinusoidal magnetic field, the magnitude of the induced voltage around the loop is proportional to the area of the loop, the frequency of the field, and the magnitude of the field. The induced voltage around the loop results in an induced electric field and current flow in the loop material. The induced current that flows in the loop depends on the conductivity of the loop.

4.2 Transmission-line Magnetic Fields

The magnetic field generated by currents on transmission-line conductors extends from the conductors through the air and into the ground. The magnitude of the field at a height of 3.28 ft. (1 m) is frequently used to describe the magnetic field under transmission lines. Because the magnetic field is not affected by non-ferrous materials, the field is not influenced by normal objects on the ground under the line. The direction of the maximum field varies with location. (The electric field, by contrast, is essentially vertical near the ground.) The most important transmission-line parameters that determine the magnetic field at

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3.28 ft. (1 m) height are conductor height above ground and magnitude of the currents flowing in the conductors. As distance from the transmission-line conductors increases, the magnetic field decreases.

Calculations of magnetic fields from transmission lines are performed using well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values usually represent the ideal straight parallel-conductor configuration. For simplicity, a flat earth is usually assumed. Balanced currents (currents of the same magnitude for each phase) are also assumed. This is usually valid for transmission lines, where loads on all three phases are maintained in balance during operation. Induced image currents in the earth are usually ignored for calculations of magnetic field under or near the right-of-way. The resulting error is negligible. Only at distances greater than 300 ft. (91 m) from a line do such contributions become significant (Deno and Zaffanella, 1982). The clearance for magnetic-field calculations for the proposed line was the same as that used for electric-field evaluations.

Standard techniques for measuring magnetic fields near transmission lines are described in ANSI IEEE Standard No. 644-1994 (IEEE, 1994). Measured magnetic fields agree well with calculated values, provided the currents and line heights that go into the calculation correspond to the actual values for the line. To realize such agreement, it is necessary to get accurate current readings during field measurements (because currents on transmission lines can vary considerably over short periods of time) and also to account for all field sources in the vicinity of the measurements.

As with electric fields, the maximum or peak magnetic fields occur in areas near the centerline and at midspan where the conductors are the lowest. The magnetic field at the edge of the right-of-way is not very dependent on line height. For a double-circuit line or if more than one line is present, the peak field will depend on the relative electrical phasing of the conductors and the direction of power flow.

4.3 Calculated Values for Magnetic Fields

Table 3 gives the calculated values of the magnetic field at 3.28 ft. (1 m) height for the proposed North Steens transmission line. Field values on the right-of-way and at the edge of the right-of-way are given for projected maximum currents, for minimum and average conductor clearances. The maximum and average currents for the three phases of the North Steens line are given in Table 1, along with the phasing of the two circuits.

The actual magnetic-field levels would vary, as currents on the lines change daily and seasonally and as ambient temperature changes. Average currents over the year would be about 35% of the maximum values. The maximum levels shown in the figures represent the highest magnetic fields expected for the proposed North Steens line. Average fields over a year would be considerably reduced from the peak values, as a result of reduced average currents and increased clearances above the minimum value.

Figure 3 shows lateral profiles of the magnetic field under maximum current and minimum clearance conditions for the three phases of the proposed transmission line. A field profile for average height under average current conditions is also included in Figure 3.

For the proposed line during Phase I, the maximum calculated magnetic field on the right-of-way is 52 mG for the maximum current of 500 A and a minimum conductor height of 32.25 ft. (9.8 m). The maximum field would decrease for increased conductor clearance. For the average conductor height of 38.4 ft. (11.7 m), the maximum field would be 14 mG. During Phases II the maximum field would be 93 mG and during Phase III, 97 mG.

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For maximum current and minimum clearance conditions during Phase I, the calculated magnetic fields at the edges of the 150-foot (45.7-m) right-of-way are 15 and 9 mG for the west and east sides of the right-of-way, respectively. For average current and conductor height during Phase I the fields at the edge of the right-of-way are 5 mG on the west side of the line and 3 mG on the east side. Under average conditions, the edge-of-right-of-way values during Phase II would be 2 and 7 mG, while during Phase III the values would be 4 and 8 mG.

4.4 Environmental Magnetic Fields

Transmission lines are not the only source of magnetic fields; as with 60-Hz electric fields, 60-Hz magnetic fields are present throughout the environment of a society that relies on electricity as a principal energy source. The magnetic fields associated with the proposed North Steens line can be compared with fields from other sources. The range of 60-Hz magnetic-field exposures in publicly accessible locations such as open spaces, transmission-line rights-of-way, streets, pedestrian walkways, parks, shopping malls, parking lots, shops, hotels, public transportation, and so on range from less than 0.1 mG to about 1 G, with the highest values occurring near small appliances with electric motors. In occupational settings in electric utilities, where high currents are present, magnetic-field exposures for workers can be above 1 G. At 60 Hz, the magnitude of the natural magnetic field is approximately 0.0005 mG.

Several investigations of residential fields have been conducted. In a large study to identify and quantify significant sources of 60-Hz magnetic fields in residences, measurements were made in 996 houses, randomly selected throughout the country (Zaffanella, 1993). The most common sources of residential fields were power lines, the grounding system of residences, and appliances. Field levels were characterized by both point-in-time (spot) measurements and 24-hour measurements. Spot measurements averaged over all rooms in a house exceeded 0.6 mG in 50 percent of the houses and 2.9 mG in 5 percent of houses. Power lines generally produced the largest average fields in a house over a 24-hour period. On the other hand, grounding system currents proved to be a more significant source of the highest fields in a house. Appliances were found to produce the highest local fields; however, fields fell off rapidly with increased distance. For example, the median field near microwave ovens was 36.9 mG at a distance of 10.5 in. (0.27 m) and 2.1 mG at 46 in. (1.17 m). Across the entire sample of 996 houses, higher magnetic fields were found in, among others, urban areas (vs. rural); multi-unit dwellings (vs. single-family); old houses (vs. new); and houses with grounding to a municipal water system.

In an extensive measurement project to characterize the magnetic-field exposure of the general population, over 1000 randomly selected persons in the United States wore a personal exposure meter for 24 hours and recorded their location in a simple diary (Zaffanella and Kalton, 1998). Based on the measurements of 853 persons, the estimated 24-hour average exposure for the general population is 1.24 mG and the estimated median exposure is 0.88 mG. The average field "at home, not in bed" is 1.27 mG and "at home, in bed" is 1.11 mG. Average personal exposures were found to be highest "at work" (mean of 1.79 mG and median of 1.01 mG) and lowest "at home, in bed" (mean of 1.11 mG and median of 0.49 mG). Average fields in school were also low (mean of 0.88 mG and median of 0.69 mG). Factors associated with higher exposures at home were smaller residences, duplexes and apartments, metallic rather than plastic water pipes, and nearby overhead distribution lines.

As noted above, magnetic fields from appliances are localized and decrease rapidly with distance from the source. Localized 60-Hz magnetic fields have been measured near about 100 household appliances such as ranges, refrigerators, electric drills, food mixers, and shavers (Gauger, 1985). At a distance of 1 ft. (0.3 m), the maximum magnetic field ranged from 0.3 to 270 mG, with 95% of the measurements below 100 mG. Ninety-five percent of the levels at a distance of 4.9 ft. (1.5 m) were less than 1 mG. Devices that use light-weight, high-torque motors with little magnetic shielding exhibited the largest

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fields. These included vacuum cleaners and small hand-held appliances and tools. Microwave ovens with large power transformers also exhibited relatively large fields. Electric blankets have been a much-studied source of magnetic-field exposure because of the length of time they are used and because of the close proximity to the body. Florig and Hoburg (1988) estimated that the average magnetic field in a person using an electric blanket was 15 mG, and that the maximum field could be 100 mG. "Low-field" blankets introduced in the 1990s have magnetic fields at least 10 times lower than those from conventional blankets (Bassen et al., 1991).

In a domestic magnetic-field survey, Silva et al. (1989) measured fields near different appliances at locations typifying normal use (e.g., sitting at an electric typewriter or standing at a stove). Specific appliances with relatively large fields included can openers (n = 9), with typical fields ranging from 30 to 225 mG and a maximum value up to 2.7 G; shavers (n = 4), with typical fields from 50 to 300 mG and maximum fields up to 6.9 G; and electric drills (n = 2), with typical fields from 56 to 190 mG and maximum fields up to 1.5 G. The fields from such appliances fall off very rapidly with distance and are only present for short periods. Thus, although instantaneous magnetic-field levels close to small hand-held appliances can be quite large, they do not contribute to average area levels in residences.

In a study with 162 subjects, Mezei et al. (2001) employed magnetic-field exposure measurements, simultaneous record-keeping of appliance proximity, and an appliance-use questionnaire to investigate the contributions of appliances to overall exposure. They found that individual appliance use did not contribute significantly to time-weighted-average exposure, unless the use was prolonged during the day of measurements. Use of small appliances did not contribute significantly to accumulated exposure but did contribute to the relatively short periods when high-field exposures were observed.

Although studies of residential magnetic fields have not all considered the same independent parameters, the following consistent characterization of residential magnetic fields emerges from the data:

- (1) External sources play a large role in determining residential magnetic-field levels. Transmission lines, when nearby, are an important external source. Unbalanced ground currents on neutral conductors and other conductors, such as water pipes in and near a house, can represent a significant source of magnetic field. Distribution lines per se, unless they are quite close to a residence, do not appear to be a traditional distance-dependent source.
- (2) Homes with overhead electrical service appear to have higher average fields than those with underground service.
- (3) Appliances represent a localized source of magnetic fields that can be much higher than average or area fields. However, fields from appliances approach area levels at distances greater than 3.28 ft. (1 m) from the device.

Although important variables in determining residential magnetic fields have been identified, quantification and modeling of their influence on fields at specific locations is not yet possible. However, a general characterization of residential magnetic-field level is possible: average levels in the United States are in the range of 0.5 to 1.0 mG, with the average field in a small number of homes exceeding this range by as much as a factor of 10 or more. Average personal exposure levels are slightly higher, possibly due to use of appliances and varying distances to other sources. Maximum fields can be much higher.

Magnetic fields in commercial and retail locations are comparable with those in residences. As with appliances, certain equipment or machines can be a local source of higher magnetic fields. Utility workers who work close to transformers, generators, cables, transmission lines, and distribution systems

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clearly experience high-level fields. Other sources of fields in the workplace include motors, welding machines, and computers. In publicly accessible indoor areas, such as offices and stores, field levels are generally comparable with residential levels, unless a high-current source is nearby.

Because high-current sources of magnetic field are more prevalent than high-voltage sources, occupational environments with relatively high magnetic fields encompass a more diverse set of occupations than do those with high electric fields. For example, in occupational magnetic-field measurements reported by Bowman et al. (1988), the geometric mean field from 105 measurements of magnetic field in "electrical worker" job locations was 5.0 mG. "Electrical worker" environments showed the following elevated magnetic-field levels (geometric mean greater than 20 mG): industrial power supplies, alternating current (ac) welding machines, and sputtering systems for electronic assembly. For secretaries in the same study, the geometric mean field was 3.1 mG for those using old style VDTs (n = 6) and 1.1 mG for those not using VDTs (n = 3).

Measurements of personal exposure to magnetic fields were made for 1,882 volunteer utility workers for a total of 4,411 workdays (Bracken, 1990). Median workday mean exposures ranged from 0.5 mG for clerical workers without computers to 7.2 mG for substation operators. Occupations not specifically associated with transmission and distribution facilities had median workday exposures less than 1.5 mG, while those associated with such facilities had median exposures above 2.3 mG. Magnetic-field exposures measured in homes during this study were comparable with those recorded in offices.

Magnetic fields in publicly accessible outdoor areas seem to be, as expected, directly related to proximity to electric-power transmission and distribution facilities. Near such facilities, magnetic fields are generally higher than indoors (residential). Higher-voltage facilities tend to have higher fields. Typical maximum magnetic fields in publicly accessible areas near transmission facilities can range from less than a few milligauss up to 300 mG or more, near heavily loaded lines operated at 230 to 765 kV. The levels depend on the line load, conductor height, and location on the right-of-way. Because magnetic fields near high-voltage transmission lines depend on the current in the line, they can vary daily and seasonally.

Fields near distribution lines and equipment are generally lower than those near transmission lines. Measurements in Montreal indicated that typical fields directly above underground distribution systems were 5 to 19 mG (Heroux, 1987). Beneath overhead distribution lines, typical fields were 1.5 to 5 mG on the primary side of the transformer, and 4 to 10 mG on the secondary side. Near ground-based transformers used in residential areas, fields were 80 to 1000 mG at the surface and 10 to 100 mG at a distance of 1 ft. (0.3 m).

The magnetic fields from the proposed line would be comparable to or less than those from existing 230-kV lines in Oregon, Washington, and elsewhere. On and near the right-of-way of the proposed line, magnetic fields would be above average residential levels. However, the fields from the line would decrease rapidly and approach common ambient levels (2 mG) at a distance of about 165 feet or less from the edge of the right-of-way under maximum current conditions and at about 70 feet or less from the edge under average current conditions. Furthermore, the fields at the edge of the right-of-way would not be above those encountered during normal activities near common sources such as hand-held appliances.

5.0 Electric and Magnetic Field (EMF) Effects

Possible effects associated with the interaction of EMF from transmission lines with people on and near a right-of-way fall into two categories: short-term effects that can be perceived and may represent a

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nuisance, and possible long-term health effects. Only short-term effects are discussed here. The issue of whether there are long-term health effects associated with transmission-line fields is controversial. In recent years, considerable research on possible biological effects of EMF has been conducted. A review of these studies and their implications for health-related effects is provided in a separate technical report for the environmental assessment of the proposed North Steens transmission line (Exponent, 2009).

5.1 Electric Fields: Short-term Effects

Short-term effects from transmission-line electric fields are associated with perception of induced currents and voltages or perception of the field. Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. These effects could occur infrequently under the proposed North Steens transmission line.

Steady-state currents are those that flow continuously after a person contacts an object and provides a path to ground for the induced current. The amplitude of the steady-state current depends on the induced current to the object in question and on the grounding path. The magnitude of the induced current to vehicles and objects under the proposed line will depend on the electric-field strength and the size and shape of the object. When an object is electrically grounded, the voltage on the object is reduced to zero, and it is not a source of current or voltage shocks. If the object is poorly grounded or not grounded at all, then it acquires some voltage relative to earth and is a possible source of current or voltage shocks.

The responses of persons to steady-state current shocks have been extensively studied, and levels of response documented (Keeseey and Letcher, 1969; IEEE, 1978). Primary shocks are those that can result in direct physiological harm. Such shocks will not be possible from induced currents under the existing or proposed lines, because clearances above ground required by the NESC preclude such shocks from large vehicles and grounding practices eliminate large stationary objects as sources of such shocks.

Secondary shocks are defined as those that could cause an involuntary and potentially harmful movement, but no direct physiological harm. Secondary shocks could occur under the proposed line when making contact with ungrounded conducting objects such as large vehicles or equipment. However, such occurrences are anticipated to be very infrequent, especially during Phase I with the lower fields under the 115-kV line. Even the infrequent shocks under the 230-kV line during Phases II and III are most likely to be below the nuisance level. Induced currents would not be perceived off the right-of-way.

Induced currents are always present in electric fields under transmission lines and will be present near the proposed line. A booklet is available from BPA describing how to live and work safely near transmission lines (USDOE, 2007). It describes safe practices for installation and maintenance of irrigation systems, underground pipes and cables, and fences on or near the right-of-way. For example, during initial construction, metal objects, such as fences, that are located on the right-of-way can be grounded to eliminate them as sources of induced current and voltage shocks. Multiple grounding points are used to provide redundant paths for induced current flow. After construction, prompt response to complaints and installation or repair of appropriate grounding can also mitigate nuisance shocks.

Unlike fences or buildings, mobile objects such as vehicles and farm machinery cannot be grounded permanently. Limiting the possibility of induced currents from such objects to persons is accomplished in several ways. First, required clearances for above-ground conductors tend to limit field strengths to levels that do not represent a hazard or nuisance. The NESC (IEEE, 2002) requires that, for lines with voltage exceeding 98 kV line-to-ground (170 kV line-to-line), sufficient conductor clearance be maintained to

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limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 milliamperes (mA) or less. The proposed line will be designed and operated to be in compliance with the NESC.

For the proposed line, conductor clearances (50°C) would be at least 32.25 ft. (9.8 m) over road crossings along the route, resulting in a maximum field of 2.1 kV/m or less at the 3.28 ft. (1 m) height for all phases. The largest truck allowed on roads in Oregon without a special permit is 14 ft. high by 8.5 ft. wide by 75 ft. long (4.3 x 2.6 x 22.9 m). The induced currents to such a vehicle oriented perpendicular to the line in a maximum field of 2.1 kV/m (at 3.28-ft. height) would be less than 2.1 mA (Reilly, 1979).

For smaller trucks, the maximum induced currents for perpendicular orientation to the proposed line would be less than this value. (Larger special-permitted trucks, such as triple trailers, can be up to 105 feet in length. However, because they average the field over such a long distance, the maximum induced current to a 105-ft. vehicle oriented perpendicular to the line at a road crossing would be less than that for the 75-foot truck.) These large vehicles are not anticipated to be off highways on the right-of-way or oriented parallel and directly under the proposed line. Thus, the NESC 5-mA criterion would be met for road crossings of the proposed line during all phases of operation. Line clearances would also be in accordance with the NESC over other areas, such as railroads, orchards and water suitable for sailboating, where additional clearance might be required.

The computed induced currents at road crossings are for worst-case conditions that occur rarely. Several factors tend to reduce the levels of induced current shocks from vehicles at road crossings and elsewhere:

- (1) Activities are distributed over the whole right-of-way, and only a small percentage of time is spent in areas where the field is at or close to the maximum value.
- (2) At road crossings, vehicles are aligned perpendicular to the conductors, resulting in a substantial reduction in induced current.
- (3) The conductor clearance at road crossings may not be at minimum values because of lower conductor temperatures and/or location of the road crossing away from midspan.
- (4) The largest vehicles are permitted only on certain highways.
- (5) Off-road vehicles are in contact with soil or vegetation, which reduces shock currents substantially.

Induced voltages occur on objects, such as vehicles, in an electric field where there is an inadequate electrical ground. If the voltage is sufficiently high, then a spark discharge shock can occur as contact is made with the object. Such shocks are similar to "carpet" shocks that occur, for example, when a person touches a doorknob after walking across a carpet on a dry day. The number and severity of spark discharge shocks depend on electric-field strength and generally of concern under lines with voltages of 345-kV or higher. Nuisance shocks, which are primarily spark discharges, are not anticipated to be a present under the proposed line.

In electric fields higher than those that would occur under the proposed line, it is theoretically possible for a spark discharge from the induced voltage on a large vehicle to ignite gasoline vapor during refueling. The probability for exactly the right conditions for ignition to occur is extremely remote. Even so, some utilities, including BPA, recommend that vehicles should not be refueled under the transmission lines unless specific precautions are taken to ground the vehicle and the fueling source (USDOE, 2007).

Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. The median field for perception in this manner was 7 kV/m for 136 persons; only about 12% could perceive fields of 2 kV/m

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or less (Deno and Zaffanella, 1982). In limited areas under the conductors at midspan during Phase II operation, the fields at ground level would exceed the levels where field perception can occur. However it is very unlikely that field perception would be common under the proposed line because fields would generally be below the perception level. Where vegetation provides shielding, the field would not be perceived.

Conductive shielding reduces both the electric field and induced effects such as shocks. Persons inside a vehicle cab or canopy are shielded from the electric field. Similarly, a row of trees or a lower-voltage distribution line reduces the field on the ground in the vicinity. Metal pipes, wiring, and other conductors in a residence or building shield the interior from the transmission-line electric field.

The electric fields from the proposed line would be comparable to or less than those from existing 230-kV lines in the project area and elsewhere. Potential impacts of electric fields can be mitigated through grounding policies and adherence to the NESC. Worst-case levels are used for safety analyses but, in practice, induced currents and voltages are reduced considerably by unintentional grounding. Shielding by conducting objects, such as vehicles and vegetation, also reduces the potential for electric-field effects.

5.2 Magnetic Field: Short-term Effects

Magnetic fields associated with transmission and distribution systems can induce voltage and current in long conducting objects that are parallel to the transmission line. As with electric-field induction, these induced voltages and currents are a potential source of shocks. A fence, irrigation pipe, pipeline, electrical distribution line, or telephone line forms a conducting loop when it is grounded at both ends. The earth forms the other portion of the loop. The magnetic field from a transmission line can induce a current to flow in such a loop if it is oriented parallel to the line. If only one end of the fence is grounded, then an induced voltage appears across the open end of the loop. The possibility for a shock exists if a person closes the loop at the open end by contacting both the ground and the conductor. The magnitude of this potential shock depends on the following factors: the magnitude of the field; the length of the object (the longer the object, the larger the induced voltage); the orientation of the object with respect to the transmission line (parallel as opposed to perpendicular, where no induction would occur); and the amount of electrical resistance in the loop (high resistance limits the current flow).

Magnetically induced currents from power lines have been investigated for many years; calculation methods and mitigating measures are available. A comprehensive study of gas pipelines near transmission lines developed prediction methods and mitigation techniques specifically for induced voltages on pipelines (Dabkowski and Taflove, 1979; Taflove and Dabkowski, 1979). Similar techniques and procedures are available for irrigation pipes and fences. Grounding policies employed by utilities for long fences reduce the potential magnitude of induced voltage.

The magnitude of the coupling with both pipes and fences is very dependent on the electrical unbalance (unequal currents) among the three phases of the line. Thus, a distribution line where a phase outage may go unnoticed for long periods of time can represent a larger source of induced currents than a transmission line where the loads are well-balanced (Jaffa and Stewart, 1981).

Knowledge of the phenomenon, grounding practices, and the availability of mitigation measures mean that magnetic-induction effects from the proposed transmission line would be minimal.

Magnetic fields from transmission and distribution facilities can interfere with certain electronic equipment. Magnetic fields can cause distortion of the image on older style VDTs and computer monitors

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that employ cathode-ray tubes. This can occur in fields as low as 10 mG, depending on the type and size of the monitor (Baishiki et al., 1990; Banfai et al., 2000). Generally, the problem arose when computer monitors were in use near electrical distribution facilities in large office buildings. Display devices using flat-panel technologies, such as liquid-crystal or plasma displays are not affected.

Interference from magnetic fields can be eliminated by shielding the affected device or moving it to an area with lower fields. Interference from 60-Hz fields with computers and control circuits in vehicles and other equipment is not anticipated at the field levels found under and near the proposed 230-kV transmission line.

The magnetic fields from the proposed line will be comparable to those from existing 230-kV lines in the area of the proposed line and elsewhere in Oregon.

6.0 Regulations

Regulations that apply to transmission-line electric and magnetic fields fall into two categories. Safety standards or codes are intended to limit or eliminate electric shocks that could seriously injure or kill persons. Field limits or guidelines are intended to limit electric- and magnetic-field exposures that can cause nuisance shocks or that might cause health effects. In no case has a limit or standard been established because of a known or demonstrated health effect.

The proposed line would be designed to meet the NESC (IEEE, 2002), which specifies how far transmission-line conductors must be from the ground and other objects. The clearances specified in the code provide safe distances that prevent harmful shocks to workers and the public. In addition, people who live and work near transmission lines must be aware of safety precautions to avoid electrical (which is not necessarily physical) contact with the conductors. For example, farmers should not up-end irrigation pipes under a transmission or other electrical line or direct the water stream from an irrigation system into or near the conductors. In addition, as a matter of safety, the NESC specifies that electric-field-induced currents from transmission lines must be below the 5 mA (“let go”) threshold deemed a lower limit for primary shock. Safety practices to protect against shock hazards near power lines are described in a brochure available from the Bonneville Power Administration (USDOE, 2001).

Field limits or guidelines have been adopted in several states and countries and by national and international organizations (Maddock, 1992). Electric-field limits have generally been based on minimizing nuisance shocks or field perception. The intent of magnetic-field limits has been to limit exposures to existing levels, given the uncertainty of their potential for health effects.

General guidelines for EMF exposure have been established for occupational and public exposure by national and international organizations. Three sets of such guidelines are described in Table 4.

The American Conference of Governmental Industrial Hygienists (ACGIH) sets guidelines (Threshold Limit Values or TLV) for occupational exposures to environmental agents (ACGIH, 2008). In general, a TLV represents the level below which it is believed that nearly all workers may be exposed repeatedly without adverse health effects. For EMF, the TLVs represent ceiling levels. For 60-Hz electric fields, occupational exposures should not exceed the TLV of 25 kV/m. However, the ACGIH also recognizes the potential for startle reactions from spark discharges and short-circuit currents in fields greater than 5-7 kV/m, and recommends implementing grounding practices. They recommend the use of conductive clothing for work in fields exceeding 15 kV/m. The TLV for occupational exposure to 60-Hz magnetic

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fields is a ceiling level of 10 G (10,000 mG) (ACGIH, 2008). These ACGIH occupational levels are all above the electric fields that would be present on the right-of-way.

The International Committee on Non-ionizing Radiation Protection (ICNIRP), working in cooperation with the World Health Organization (WHO) has developed guidelines for occupational and public exposures to EMF (ICNIRP, 1998). For occupational exposures at 60 Hz, the recommended limits to exposure are 8.3 kV/m for electric fields and 4.2 G (4,200 mG) for magnetic fields. The electric-field level can be exceeded, provided precautions are taken to prevent spark discharge and induced current shocks. For the general public, the ICNIRP guidelines recommend exposure limits of 4.2 kV/m for electric fields and 0.83 G (830 mG) for magnetic fields (ICNIRP, 1998).

More recently the International Committee on Electromagnetic Safety (ICES) under the auspices of the IEEE has established exposure guidelines for 60-Hz electric and magnetic fields (ICES, 2002). The ICES recommended limits for occupational exposures are 20 kV/m for electric fields and 27,100 mG for magnetic fields. The recommended limits for the general public are lower: 5 kV/m for the general public to electric fields, except on power line rights-of-way where the limit is 10 kV/m; and 9,040 mG for magnetic fields.

Electric and magnetic fields from various sources (including automobile ignitions, appliances and, possibly, transmission lines) can interfere with implanted cardiac pacemakers. In light of this potential problem, manufacturers design devices to be immune from such interference. However, research has shown that these efforts have not been completely successful and that a few models of older pacemakers still in use could be affected by 60-Hz fields from transmission lines. There were also numerous models of pacemakers that were not affected by fields larger than those found under transmission lines. Because of the known potential for interference with pacemakers by 60-Hz fields, field limits for pacemaker wearers have been established by the ACGIH. They recommend that, lacking additional information about their pacemaker, wearers of pacemakers and similar medical-assist devices limit their exposure to electric fields of 1 kV/m or less and to magnetic fields to 1 G (1,000 mG) or less (ACGIH, 2008). Additional discussion of interference with implanted devices is given in the accompanying technical report on health effects (Exponent 2009).

There are currently no national standards in the United States for 60-Hz electric and magnetic fields. Oregon's formal rule in its transmission-line-siting procedures specifically addresses field limits. The Oregon limit of 9 kV/m for electric fields is applied to areas accessible to the public (Oregon, State of, 1980). The Oregon rule also addresses grounding practices, audible noise, and radio interference. Oregon does not have a limit for magnetic fields from transmission lines.

Besides Oregon, several states have been active in establishing mandatory or suggested limits on 60-Hz electric and (in two cases) magnetic fields. Five other states have specific electric-field limits that apply to transmission lines: Florida, Minnesota, Montana, New Jersey, and New York. Florida and New York have established regulations for magnetic fields. These regulations are summarized in Table 5.

Government agencies and utilities operating transmission systems have established design criteria that include EMF levels. BPA has maximum allowable electric fields of 9 and 5 kV/m on and at the edge of the right-of-way, respectively (USDOE, 1996). BPA also has maximum-allowable electric-field strengths of 5 kV/m, 3.5 kV/m, and 2.5 kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively. These levels are based on limiting the maximum short-circuit currents from anticipated vehicles to less than 1 mA in shopping center lots and to less than 2 mA in commercial parking lots.

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The electric fields from the proposed transmission line would meet the ACGIH, ICNIRP, and IEEE standards, provided wearers of pacemakers and similar medical-assist devices are discouraged from unshielded right-of-way use. (A passenger in an automobile under the line would be shielded from the electric field.) The magnetic fields from the proposed line would be below the ACGIH occupational limits, and well as below those of ICNIRP and IEEE for occupational and public exposures. The electric fields present on the right-of-way could induce currents in ungrounded vehicles that exceeded the ICNIRP and IEEE levels of 0.5 mA.

The estimated peak electric fields on the right-of-way of the proposed transmission line would meet the limits of all states and the BPA electric field criteria (see Table 5). The edge-of-right-of-way electric fields from the proposed line would be below the edge-of-right-of-way limits set by all states. The magnetic field at the edge of the right-of-way from the proposed line would be below the regulatory levels of states where such regulations exist.

7.0 Audible Noise

7.1 Basic Concepts

Audible noise (AN), as defined here, represents an unwanted sound, as from a transmission line, transformer, airport, or vehicle traffic. Sound is a pressure wave caused by a sound source vibrating or displacing air. The ear converts the pressure fluctuations into auditory sensations. AN from a source is superimposed on the background or ambient noise that is present before the source is introduced.

The amplitude of a sound wave is the incremental pressure resulting from sound above atmospheric pressure. The sound-pressure level is the fundamental measure of AN; it is generally measured on a logarithmic scale with respect to a reference pressure. The sound-pressure level (SPL) in decibels (dB) is given by:

$$\text{SPL} = 20 \log (P/P_0)\text{dB}$$

where P is the effective rms (root-mean-square) sound pressure, P_0 is the reference pressure, and the logarithm (log) is to the base 10. The reference pressure for measurements concerned with hearing is usually taken as 20 micropascals (Pa), which is the approximate threshold of hearing for the human ear. A logarithmic scale is used to encompass the wide range of sound levels present in the environment. The range of human hearing is from 0 dB up to about 140 dB, a ratio of 10 million in pressure (EPA, 1978).

Logarithmic scales, such as the decibel scale, are not directly additive: to combine decibel levels, the dB values must be converted back to their respective equivalent pressure values, the total rms pressure level found, and the dB value of the total recalculated. For example, adding two sounds of equal level on the dB scale results in a 3 dB increase in sound level. Such an increase in sound pressure level of 3 dB, which corresponds to a doubling of the energy in the sound wave, is barely discernible by the human ear. It requires an increase of about 10 dB in SPL to produce a subjective doubling of sound level for humans. The upper range of hearing for humans (140 dB) corresponds to a sharply painful response (EPA, 1978).

Humans respond to sounds in the frequency range of 16 to 20,000 Hz. The human response depends on frequency, with the most sensitive range roughly between 2000 and 4000 Hz. The frequency-dependent sensitivity is reflected in various weighting scales for measuring audible noise. The A-weighted scale weights the various frequency components of a noise in approximately the same way that the human ear responds. This scale is generally used to measure and describe levels of environmental sounds such as

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those from vehicles or occupational sources. The A-weighted scale is also used to characterize transmission-line noise. Sound levels measured on the A-scale are expressed in units of dB(A) or dBA.

AN levels and, in particular, corona-generated audible noise (see below) vary in time. In order to account for fluctuating sound levels, statistical descriptors have been developed for environmental noise. Exceedance levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of the time. Thus, the L_5 level refers to the noise level that is exceeded only 5% of the time. L_{50} refers to the sound level exceeded 50% of the time. Sound-level measurements and predictions for transmission lines are often expressed in terms of exceedance levels, with the L_5 level representing the maximum level and the L_{50} level representing a median level.

Table 6 shows AN levels from various common sources. Clearly, there is wide variation. Noise exposure depends on how much time an individual spends in different locations. Outdoor noise generally does not contribute to indoor levels (EPA, 1974). Activities in a building or residence generally dominate interior AN levels.

BPA has established a transmission-line design criterion for corona-generated audible noise (L_{50} , foul weather) of 50 dBA at the edge of the right-of-way (USDOE, 2006). This criterion applies to new line construction and is under typical conditions of foul weather, altitude, and system voltage for the line. It is generally only of concern for 500-kV lines.

The EPA has established a guideline of 55 dBA for the annual average day-night level (L_{dn}) in outdoor areas (EPA, 1978). In computing this value, a 10 dB correction (penalty) is added to night-time noise between the hours of 10 p.m. and 7 a.m.

7.2 Transmission-line Audible Noise

Corona is the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that, under certain conditions, is accompanied by a 120-Hz hum. Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345 kV and higher during foul weather. However, the proposed line will produce some noise under foul weather conditions.

The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, protrusions on the conductor surface—particularly water droplets on or dripping off the conductors—cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Based on hourly precipitation records near the route of the proposed transmission line, such conditions are expected to occur about 7% of the time during the year in the North Steens area.

For a few months after line construction, residual grease or oil on the conductors can cause water to bead up on the surface. This results in more corona sources and slightly higher levels of audible noise and electromagnetic interference if the line is energized. However, the new conductors "age" in a few months, and the level of corona activity decreases to the predicted equilibrium value. During fair weather, insects and dust on the conductor can also serve as sources of corona.

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7.3 Predicted Audible Noise Levels

Corona-generated audible-noise levels are calculated for average voltage and average conductor heights for fair- and foul-weather conditions. The predicted levels of audible noise for the proposed line operated at a voltage of 241.5 kV are given in Table 7 and plotted in Figure 4 for Phases II and III, which have the only noise levels that will be noticeable.

The calculated median level (L_{50}) during foul weather at the edge of the proposed North Steens line right-of-way (75 ft. from centerline) is 47 dBA for Phase III operation and 44 dBA for Phase II. The calculated maximum level (L_5) during foul weather at the edge of the right-of-way for Phase III is 50 dBA. During fair-weather conditions, which occur about 93% of the time in the North Steens area, audible noise levels at the edge of the right-of-way would be about 20 dBA (if corona were present). The predicted foul and fair weather levels from Phase I (115-kV) are below 20 dBA. These lower levels could be masked by ambient noise on and off the right-of-way and would only be perceptible on rare occasions very near the line. .

7.4 Discussion

The calculated foul-weather corona noise levels for the proposed line would be comparable to, or less than, those from existing 230-kV lines in Oregon. During fair weather, noise from the 230-kV conductors might be perceivable on the right-of-way; however, beyond the right-of-way it would very likely be masked or so low as not to be perceived. During foul weather, when ambient noise is higher, it is also likely that corona-generated noise off the right-of-way would be masked to some extent.

On and off the right-of-way, the levels of audible noise from the proposed line during foul weather would be well below the 55-dBA level that can produce interference with speech outdoors. Also the predicted L_{50} foul weather value is below 50 dBA and occurs very infrequently. Therefore the estimated L_{dn} at the edge of the right-of-way of the proposed line would be well below the EPA annual guideline for L_{dn} of 55 dBA.

If the North Route is selected only five residence would be within 1300 feet of the line, with the nearest residence at 75 feet. The other four houses would be 200 feet or greater from the line. At the 75-foot distance, audible noise would be as reported above for the edge of the right-of-way, with a median level, L_{50} , during foul weather of 47 dBA. A possible alternative to the North Route would increase the distance to the nearest residences to about 200 feet (61 m), where the median foul weather audible noise would be about 43 dBA.

If the West Route is selected, only two residences would be closer than 1300 feet (395 m) with the nearest at 550 feet (165 m), where the L_{50} foul weather value would be about 38 dBA.

Thus, only a few residences would be impacted and at all residences the audible noise from the transmission line would be within guidelines established by the EPA, the State of Oregon, and BPA. At all locations ambient noise would be increased during foul weather due to wind and rain hitting foliage or buildings. At the larger distances this increase could be sufficient to mask the noise from the transmission line.

There would be no transformers or reactors at the interconnection stations adjacent to the existing 115-or 230-kV lines. Therefore the audible noise at these locations will be due to noise from the transmission line conductors. As noted above this noise will be barely perceptible, if at all, during fair weather, and would be below established noise limits during fair weather.

7.5 Conclusion

Along the proposed line route there could be increases in the perceived noise above ambient levels during foul weather at the edges of the proposed right-of-way. The corona-generated noise during foul weather would be masked to some extent by naturally occurring sounds such as wind and rain on foliage. During fair weather, the noise off the right-of-way from the proposed line would probably not be detectable above ambient levels. The noise levels from the proposed line would be below levels identified as causing interference with speech or sleep. The audible noise from the transmission line would be below EPA guideline levels and would meet the BPA design criterion that complies with state noise regulations. The new connection station are not anticipated to increase noise levels above those due to the nearby transmission lines.

8.0 Electromagnetic Interference

8.1 Basic Concepts

Corona on transmission-line conductors can also generate electromagnetic noise in the frequency bands used for radio and television broadcast signals. The noise can cause radio and television interference (RI and TVI). In certain circumstances, corona-generated electromagnetic interference (EMI) can also affect communications systems and other sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345 kV or higher. This is especially true of interference with television signals. The single 1.545-in diameter conductor used in the design of the proposed line would mitigate corona generation and keep radio and television interference levels at acceptable levels and below those of many existing 230-kV lines with smaller conductors.

Spark gaps on distribution lines and on low-voltage wood-pole transmission lines are a more common source of RI/TVI than is corona from high-voltage electrical systems. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires. The proposed transmission line would be constructed with modern hardware that eliminates such problems and therefore minimizes gap noise. Consequently, this source of EMI is not anticipated for the proposed line.

No state has limits for either RI or TVI. In the United States, electromagnetic interference from power transmission systems is governed by the Federal Communications Commission (FCC) Rules and Regulations presently in existence (FCC, 1988). A power transmission system falls into the FCC category of "incidental radiation device," which is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." For purposes of these regulations, harmful interference is defined as: "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (FCC, 1988: Vol II, part 15. 47CFR, Ch. 1).

Electric power companies have been able to work quite well under the present FCC rule because harmful interference can generally be eliminated. It has been estimated that more than 95 percent of power-line sources that cause interference are due to gap-type discharges. These can be found and completely eliminated, when required to prevent interference (USDOE, 1980). Complaints related to corona-

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generated interference occur infrequently. This is especially true with the advent of cable television and satellite television, which are not subject to corona-generated interference. Mitigation of corona-generated interference with conventional broadcast radio and television receivers can be accomplished in several ways, such as use of a directional antenna or relocation of an existing antenna (USDOE, 1977; USDOE, 1980; Loftness et al., 1981).

8.2 Radio Interference (RI)

Radio reception in the AM broadcast band (535 to 1605 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near to transmission lines can be affected by RI. The IEEE Radio Noise Design Guide identifies an acceptable limit of fair-weather RI as expressed in decibels above 1 microvolt per meter (dB μ V/m) of about 40 dB μ V/m at 100 ft. (30 m) from the outside conductor (IEEE Committee Report, 1971). As a general rule, average levels during foul weather (when the conductors are wet) are 16 to 22 dB μ V/m higher than average fair-weather levels.

8.3 Predicted RI Levels

The predicted median (L_{50}) fair-weather RI levels at 100 ft. (30 m) from the outside conductor for the proposed Phase III line operating at 241.5 kV is 34 dB μ V/m. This level is well below the IEEE 40 dB μ V/m criterion for fair weather levels at distances greater than about 100 ft. (30 m) from the outside conductor. Predicted fair-weather L_{50} levels are comparable to, or lower than, those for existing 230-kV lines in Oregon. The RI levels from the Phase I and II lines would be lower than those from Phase III.

8.4 Television Interference (TVI)

Corona-caused TVI occurs during foul weather and is generally of concern for transmission lines with voltages of 345 kV or above, and only for conventional receivers within about 600 ft. (183 m) of such a line. As is the case for RI, gap sources on distribution and low-voltage transmission lines are the principal observed sources of TVI. The use of modern hardware and construction practices for the proposed line would minimize such sources. TVI levels are expressed in dB μ V/m at 75 MHz.

8.5 Predicted TVI Levels

The foul weather TVI level predicted at 100 ft. (30 m) from the outside conductor of the proposed line Phase III 230-kV line is 18 dB μ V/m with the line operating at 241.5 kV. This is considerably below foul-weather TVI levels from existing 500-kV lines (24-27 dB μ V/m), where TVI can be a problem.

Other forms of TVI from transmission lines are signal reflection (ghosting) and signal blocking caused by the relative locations of the transmission structure and the receiving antenna with respect to the incoming television signal. The steel pole towers proposed for use in the design of the proposed line are less effective in causing this type of interference than are lattice steel towers.

The distances between the proposed line route and all houses, except the single nearby residence adjacent to the edge of the North Route right-of-way, make any type of broadcast television interference very unlikely. Since other residences are 200 feet (60 m) or more from the line, corona-generated TVI, signal reflection or signal blocking are not anticipated to occur due to the proposed line. If interference with

broadcast signals should occur at the nearest residence, there are mitigation techniques available to eliminate it, as described previously.

Television systems that operate at higher frequencies, such as satellite receivers, are not affected by corona-generated TVI. Cable television systems are similarly unaffected.

8.6 Interference with Other Devices

Corona-generated interference can conceivably cause disruption on other communications bands such as the citizen's (CB) and mobile bands. However, mobile-radio communications are not susceptible to transmission-line interference because they are generally frequency modulated (FM). Similarly, cellular telephones operate at a frequency of 900 MHz or higher, which is above the frequency where corona-generated interference is prevalent. In the unlikely event that interference occurs with these or other communications, mitigation can be achieved with the same techniques used for television and AM radio interference. As digital signal processing has been integrated into communications the potential impact of corona-generated EMI has decreased substantially.

8.7 Conclusion

Predicted EMI levels for the proposed transmission line are comparable to, or lower, than those that already exist near 230-kV lines and no impacts of corona-generated interference on radio, television, or other receptors are anticipated. Furthermore, if interference should occur, there are various methods for correcting it.

9.0 Other Corona Effects

Intense corona is visible as a bluish glow or as bluish plumes on higher voltage lines. On the proposed 230-kV line, corona levels would be relatively low, so it is very unlikely that it could be observed. Any corona on the conductors would be observable only under the darkest conditions and only with the aid of binoculars, if at all. Without a period of adaptation for the eyes and without intentional looking for the corona, it would not be noticeable.

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. Ozone is approximately 90% of the oxidants, while the remaining 10% is composed principally of nitrogen oxides. The corona level predicted for the proposed line is much lower than that from 500-kV lines. The levels from 500-kV lines are significantly below natural levels and fluctuations in natural levels. Consequently, any production of ozone from the proposed 230-kV line would be essentially undetectable at ground level.

10.0 Summary

Electric and magnetic fields from the proposed transmission line have been characterized using well-known techniques accepted within the scientific and engineering community. The expected electric-field levels from the proposed line at minimum design clearance would be comparable to those from existing 115-kV and 230-kV lines in Oregon, and elsewhere. The expected magnetic-field levels from the proposed line would be comparable to those from other 115-kV and 230-kV lines in Oregon, and elsewhere.

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When the proposed line is operated at 115-kV, the peak electric field expected on the right-of-way would be 1.3 kV/m and the maximum value at the edge of the right-of-way would be about 0.3 kV/m. When operated at 230-kV, the maximum field values would be 2.1 kV/m on the right-of-way and 0.1 kV/m at the edge. The same maximum field values apply to road crossings for the two operating voltages.

For the single circuit Phase I 115-kV operation the peak magnetic field on the right-of-way would be a maximum of 52 mG and an average value of 14 mG. At the edge of the right-of-way during Phase I, the largest fields would occur at the west edge with a maximum of 15 mG and an average value of 5 mG. For double circuit operation with maximum current the peak fields on the right-of-way would be 93 mG for Phase II and 97 mG for Phase III. On average the peak magnetic field would be about one fourth the maximum value. During double circuit operation the largest fields would occur at the east edge of the right-of-way, where the maximum would be 21 mG during Phase II and 25 mG during Phase III. Average values at the edge of the right-of-way during double-circuit operation would be about one third of the maximum values.

The electric fields from the proposed line would meet regulatory limits for public exposure in Oregon and all other states that have limits and would meet the regulatory limits or guidelines for peak fields established by national and international guideline setting organizations. The magnetic fields from the proposed line would be within the regulatory limits of the two states that have established them and within guidelines for public exposure established by ICNIRP and IEEE. The state of Oregon does not have limits for magnetic fields from transmission lines.

Short-term effects from transmission-line fields are well understood and can be mitigated. Nuisance shocks arising from electric-field induced currents and voltages could be perceivable on the right-of-way of the proposed line. Such occurrences are anticipated to be rare. It is common practice to ground permanent conducting objects during and after construction to mitigate against such occurrences.

Corona-generated audible noise from the proposed line could be perceivable during foul weather at the edge of the right-of-way. The levels would be comparable with, or less than, those near existing 230-kV transmission lines in Oregon, would be in compliance with noise regulations in Oregon, and would be below levels specified in EPA guidelines.

Corona-generated electromagnetic interference from the proposed line would be comparable to or less than that from existing 230-kV lines in Oregon. Radio interference levels would be below limits identified as acceptable. Television interference, a foul-weather phenomenon usually associated with higher voltage lines, is not anticipated to occur from the proposed line.

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Table 1: Physical and electrical characteristics of the proposed North Steens double-circuit transmission-line. See Figure 1 for drawing of tower.

Phase	I		II		III	
	West	East	West	East	West	East
Voltage¹, kV	121.7	–	121.7	241.5	241.5	241.5
Current, A Maximum/average	500/175	–	500/175	1000/350	261/91	1000/350
Electric phasing	A B C	–	A B C	C B A	A B C	C B A
Clearance, ft. Minimum/Average²	32.25/38.4		32.25/38.4		32.25/38.4	
Tower configuration	Vertical Single Circuit		Vertical Double Circuit		Vertical Double Circuit	
Phase spacing, ft.³	16V		24H, 16 V		24H, 16 V	
Conductor diameter, in	1.545		1.545		1.545	

- ¹ Maximum and average voltage assumed to be the same.
- ² Average voltage and average clearance used for corona calculations.
- ³ H = horizontal spacing, feet; V = vertical spacing, feet

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Table 2: Calculated peak and edge of right-of-way (ROW) electric fields for the proposed North Steens transmission line operated at maximum voltage.

Phase	Electric Field, kV/m					
	I		II		III	
Field ¹	Maximum	Average	Maximum	Average	Maximum	Average
Peak on ROW	1.3	1.0	2.1	1.5	1.8	1.2
At Edge of ROW²	0.02, 0.04	0.3, 0.02	0.05, 0.04	0.05, 0.08	0.05	0.09

- ¹ Maximum = Maximum voltage and minimum clearance; Average = Maximum voltage and average clearance.
² Fields at west edge of right-of-way adjacent to the Phase I circuit are given first.

Table 3: Calculated peak and edge of right-of-way (ROW) magnetic fields for the proposed North Steens transmission line.

Phase	Magnetic Field, mG					
	I		II		III	
Field ¹	Maximum	Average	Maximum	Average	Maximum	Average
Peak on ROW	52	14	93	23	97	25
At Edge of ROW²	15, 9	5, 3	7, 21	2, 7	12, 25	4, 8

- ¹ Maximum = Maximum current and minimum clearance; Average = Average current and average clearance.
² Fields at west edge of right-of-way adjacent to the Phase I circuit are given first.

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Table 4: Electric- and magnetic-field exposure guidelines.

ORGANIZATION	TYPE OF EXPOSURE	ELECTRIC FIELD, kV/m	MAGNETIC FIELD, mG
ACGIH	Occupational	25 ¹	10,000
ICNIRP	Occupational	8.3 ²	4,200
	General Public	4.2	833
IEEE	Occupational	20	27,100
	General Public	5 ³	9,040

¹ Grounding is recommended above 5 –7 kV/m and conductive clothing is recommended above 15 kV/m.

² Increased to 16.7 kV/m if nuisance shocks are eliminated.

³ Within power line rights-of-way, the guideline is 10 kV/m.

Sources: ACGIH, 2008; ICNIRP, 1998; ICES, 2002

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Table 5: States with transmission-line field limits.

STATE AGENCY	WITHIN RIGHT-OF- WAY	AT EDGE OF RIGHT-OF- WAY	COMMENTS
a. 60-Hz ELECTRIC-FIELD LIMIT, kV/m			
Florida Department of Environmental Regulation	8 (230 kV) 10 (500 kV)	2	Codified regulation, adopted after a public rulemaking hearing in 1989.
Minnesota Environmental Quality Board	8	–	12-kV/m limit on the high voltage direct current (HVDC) nominal electric field.
Montana Board of Natural Resources and Conservation	7 ¹	1 ²	Codified regulation, adopted after a public rulemaking hearing in 1984.
New Jersey Department of Environmental Protection	–	3	Used only as a guideline for evaluating complaints.
New York State Public Service Commission	11.8 (7,11) ³	1.6	Explicitly implemented in terms of a specified right-of-way width.
Oregon Facility Siting Council	9	–	Codified regulation, adopted after a public rulemaking hearing in 1980.
b. 60-Hz MAGNETIC-FIELD LIMIT, mG			
Florida Department of Environmental Regulation	–	150 (230 kV) 200 (500 kV)	Codified regulations, adopted after a public rulemaking hearing in 1989.
New York State Public Service Commission	–	200	Adopted August 29, 1990.

¹ At road crossings
² Landowner may waive limit
³ At highway and private road crossings, respectively

Source: USDOE, 1996

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Table 6: Common noise levels.

Sound Level, dBA	Noise Source or Effect
128	Threshold of pain
110	Rock-and-roll band
80	Truck at 50 ft.
70	Gas lawnmower at 100 ft.
60	Normal conversation indoors
50	Moderate rainfall on foliage
47	L ₅₀ at edge of right-of-way during rain for Phase III
40	Refrigerator
25	Bedroom at night
0	Hearing threshold

Adapted from: USDOE, 1996.

Table 7: Predicted foul-weather and fair-weather audible noise (AN) levels at edge of right-of-way (ROW) for the proposed North Steens transmission line. AN levels expressed in decibels on the A-weighted scale (dBA).

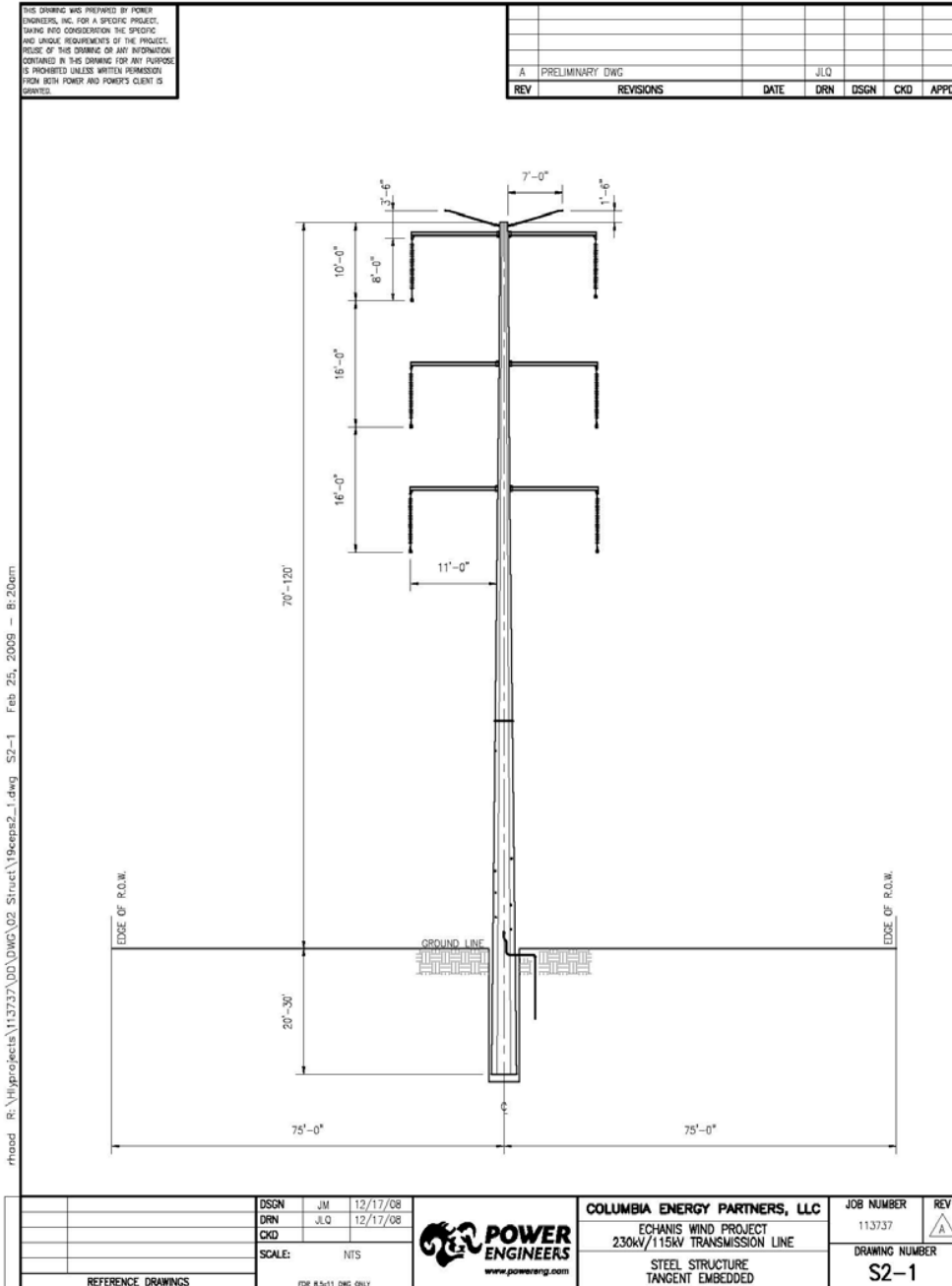
Phase	Audible Noise at Edge of ROW, dBA					
	I		II		III	
	L ₅₀ , dBA	L ₅ , dBA	L ₅₀ , dBA	L ₅ , dBA	L ₅₀ , dBA	L ₅ , dBA
<u>Descriptor</u> ¹						
Foul Weather ²	8, 6	11, 10	43, 44	46, 47	47	50
Fair Weather ²	–	–	18, 19	21, 22	22	25

¹ L₅₀ and L₅ denote the levels exceeded 50 and 5 percent of the time, respectively.

² Fields at west edge of right-of-way adjacent to the Phase I circuit are given first.

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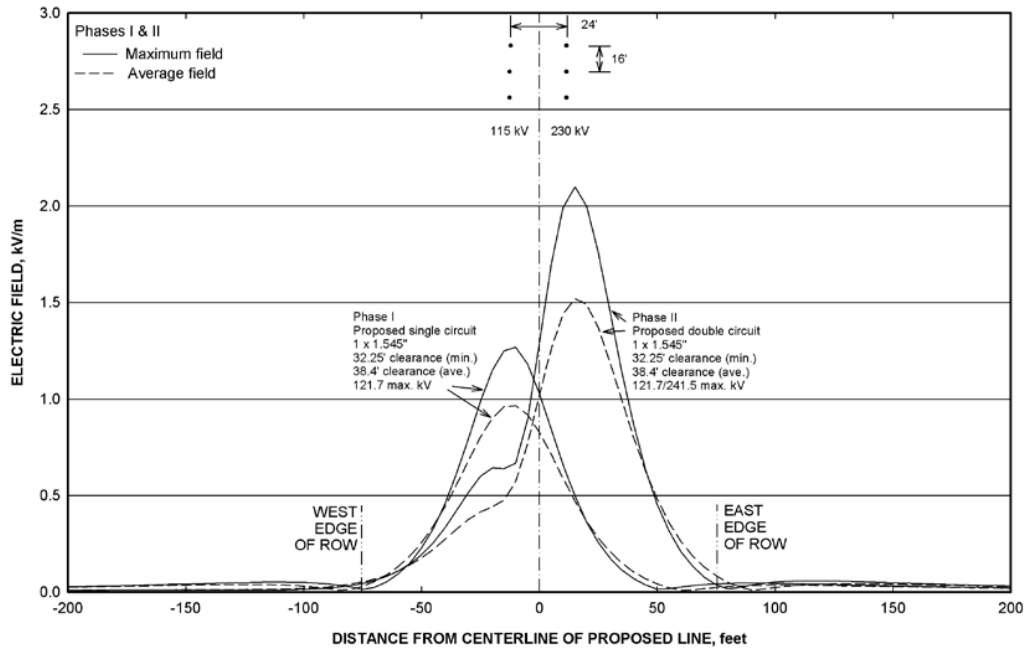
Figure 1: Double circuit tower for the proposed North Steens transmission line. Line configurations for Phases I, II and III are described in Table 1.



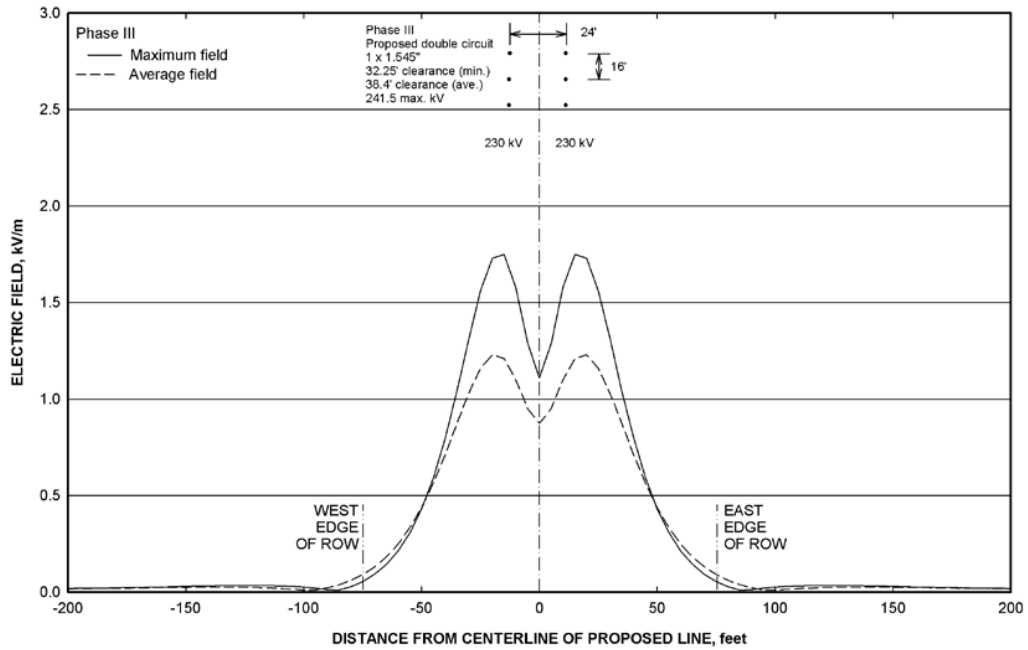
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Figure 2: Calculated maximum and average electric-field profiles for the proposed North Steens transmission line: a) Phases I and II; b) Phase III. Line configurations are described in Table 1.

a) Phases I and II



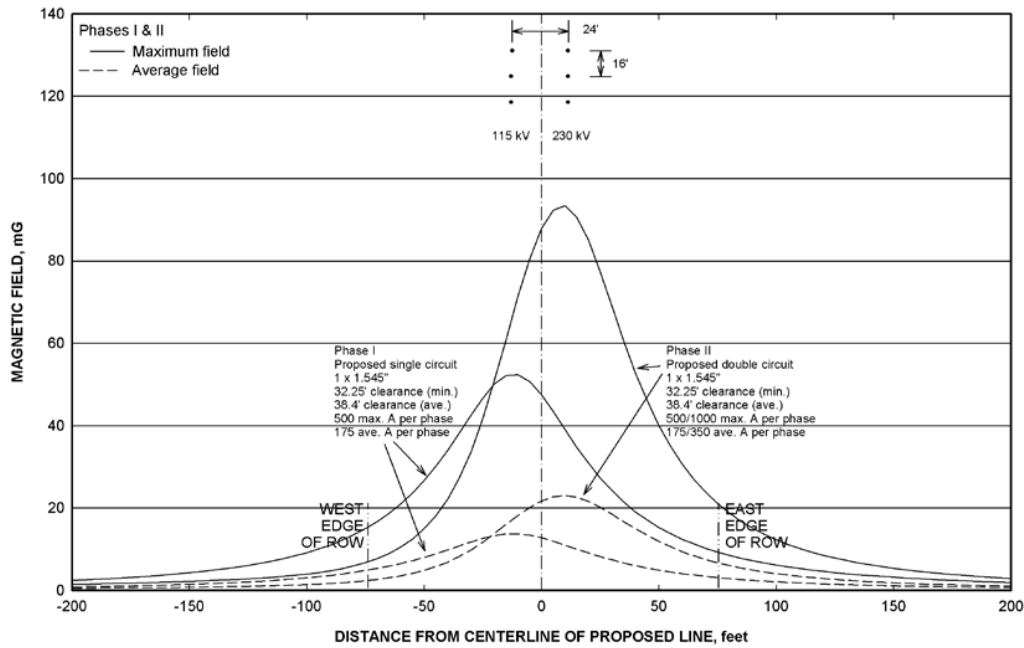
b) Phase III



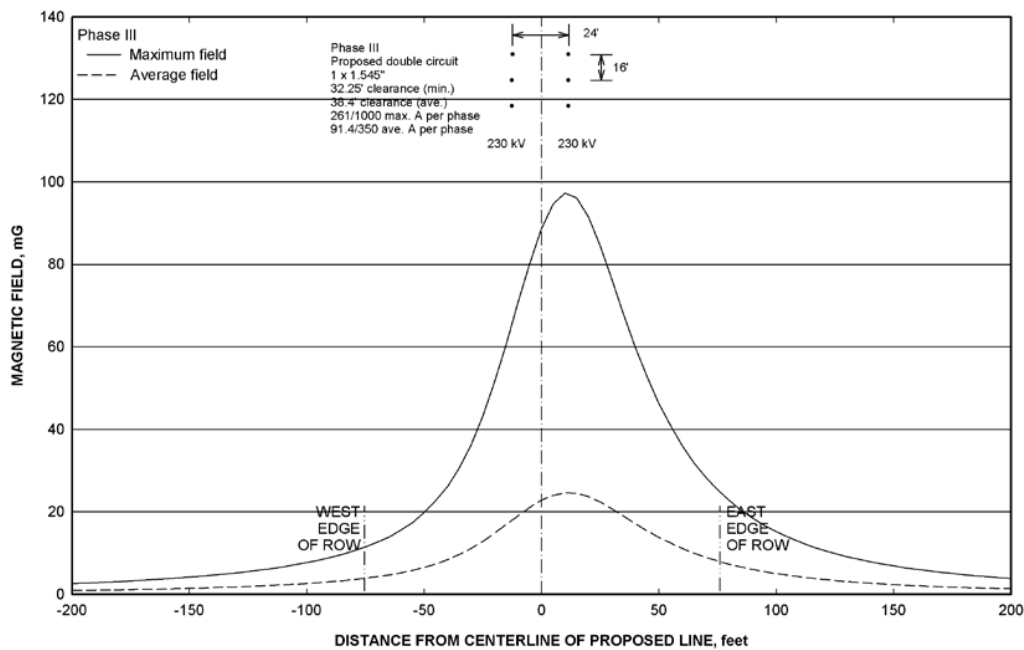
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Figure 3: Calculated maximum and average magnetic-field profiles for the proposed North Steens transmission line: a) Phases I and II; b) Phase III. Line configurations are described in Table 1.

a) Phases I and II

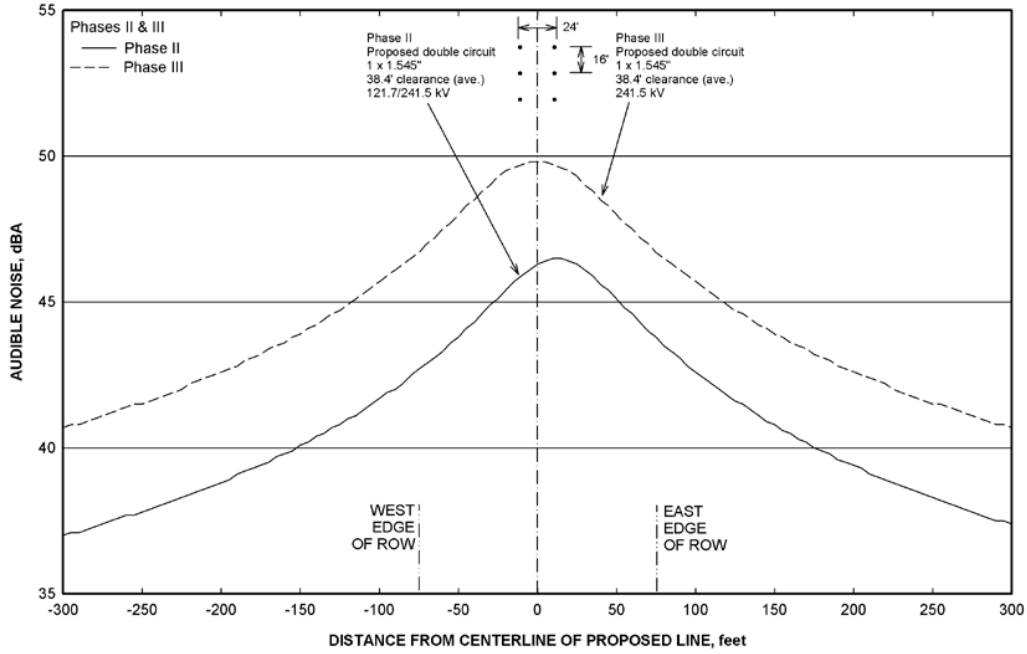


b) Phase III



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Figure 4: Predicted foul-weather L₅₀ audible noise levels for Phases II and III of the proposed North Steens transmission line. Line configurations are described in Table 1.



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**Big Eddy-Knight 500-kV
Project, Final EIS, Appendix E
(July 2011)**

Appendix E
**Electric Fields, Magnetic Fields,
Noise, and Radio Interference**

BIG EDDY – KNIGHT
500-kV TRANSMISSION PROJECT

APPENDIX E
ELECTRICAL EFFECTS

March 2010

Prepared by
T. Dan Bracken, Inc.

for

Bonneville Power Administration

*Bonneville Power Administration/Big Eddy – Knight 500-kV Transmission Project
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ELECTRICAL EFFECTS FROM THE PROPOSED BIG EDDY – KNIGHT 500-kV TRANSMISSION LINE PROJECT

1.0 Introduction

The Bonneville Power Administration (BPA) is proposing to build an approximately 28-mile 500-kilovolt (kV) transmission line from the existing BPA Big Eddy Substation in Wasco County, Oregon to the proposed BPA Knight Substation near Goldendale in Klickitat, County, Washington. The proposed line is designated the Big Eddy – Knight transmission line. The proposed transmission line will traverse mostly arid pasture and agricultural land that is sparsely populated. However, there are scattered structures throughout the project area. Three alternative routes – West, Middle and East - are under consideration for the proposed transmission line as shown in Figure 1.

The purpose of this report is to describe and quantify the electrical effects of the proposed Big Eddy – Knight 500-kV transmission line along the alternative routes. These effects include the following:

- the levels of 60-hertz (Hz; cycles per second) electric and magnetic fields (EMF) at 3.28 feet (ft.) or 1 meter (m) above the ground,
- the effects associated with those fields,
- the levels of audible noise produced by the line, and
- electromagnetic interference associated with the line.

Electrical effects occur near all transmission lines, including those 500-kV lines already present in the area of the proposed route for the Big Eddy – Knight line. Therefore, the levels of these quantities for the proposed line are computed and compared with those from the existing lines in Oregon, Washington and elsewhere.

The proposed line would be built on new and existing right-of-way, paralleling existing lower voltage lines along portions of the route. The length of the sections with parallel line depends on the alternative route. Electrical effects were analyzed for all segments with or without parallel lines that had constant physical and electrical characteristics for over more than one mile. Shorter segments (< 1 mile) could occur where the line changes direction, crosses a roadway or enters a substation. The electrical effects associated with these short line segments would be very similar to those for the analyzed segments. The proposed project has 13 different line configurations (physical and electrical changes that could affect the field levels) with line segments greater than one mile in length. The 13 line configurations are described in Table 1.

The voltage on the conductors of transmission lines generates an electric field in the space between the conductors and the ground. The electric field is calculated or measured in units of volts-per-meter (V/m) or kilovolts-per-meter (kV/m) at a height of 3.28 feet (ft.) (1 meter [m]) above the ground. The current flowing in the conductors of the transmission line generates a magnetic field in the air and earth near the transmission line; current is expressed in units of amperes (A). The magnetic field is expressed in milligauss (mG), and is usually measured or calculated at a height of 3.28 ft. (1 m) above the ground. The electric field at the surface of the conductors causes the phenomenon of corona. Corona is the electrical breakdown or ionization of air in very strong electric fields, and is the source of audible noise, electromagnetic radiation, and visible light.

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To quantify EMF levels along the route, the electric and magnetic fields from the proposed and existing lines were calculated using the BPA Corona and Field Effects Program (USDOE, undated). In this program, the calculation of 60-Hz fields uses standard superposition techniques for vector fields from several line sources: in this case, the line sources are transmission-line conductors. (Vector fields have both magnitude and direction: these must be taken into account when combining fields from different sources.) Important input parameters to the computer program are voltage, current, and geometric configuration of the line. The transmission-line conductors are assumed to be straight, parallel to each other, and located above and parallel to an infinite flat ground plane. Although such conditions do not occur under real lines because of conductor sag and variable terrain, the validity and limitations of calculations using these assumptions have been well verified by comparisons with measurements. This approach was used to estimate fields for the proposed Big Eddy -Knight line, where minimum clearances were assumed to provide worst-case (highest) estimates for the fields.

Electric fields are calculated using an imaging method. Fields from the conductors and their images in the ground plane are superimposed with the proper magnitude and phase to produce the total field at a selected location.

The total magnetic field is calculated from the vector summation of the fields from currents in all the transmission-line conductors. Balanced currents are assumed for each three-phase circuit and the contribution of induced image currents in the conductive earth is not included. Peak current and power flow direction for the proposed line were provided by BPA and are based on the projected system normal annual peak power loads in 2013.

Electric and magnetic fields for the proposed line were calculated at the standard height (3.28 ft. or 1 m) above the ground (IEEE, 1987). Calculations were performed out to 300 ft. (91 m) from the centerline of the existing corridor. The validity and limitations of such calculations have been well verified by measurements. Because maximum voltage, maximum current, and minimum conductor height above-ground are used, ***the calculated values given here represent worst-case conditions:*** i.e., the calculated fields are higher than they would be in practice. Such worst-case conditions would seldom occur.

The corona performance of the proposed line was also predicted using the BPA Corona and Field Effects Program (USDOE, undated). Corona performance is calculated using empirical equations that have been developed over several years from the results of measurements on numerous high-voltage lines (Chartier and Stearns, 1981; Chartier, 1983). The validity of this approach for corona-generated audible noise has been demonstrated through comparisons with measurements on other lines all over the United States (IEEE Committee Report, 1982). The accuracy of this method for predicting corona-generated radio and television interference from transmission lines has also been established (Olsen et al., 1992). Important input parameters to the computer program are voltage, current, conductor size, and geometric configuration of the line.

Corona is a highly variable phenomenon that depends on conditions along a length of line. Predictions of the levels of corona effects are reported in statistical terms to account for this variability. Calculations of audible noise and electromagnetic interference levels were made under conditions of an estimated average operating voltage (536 kV for the proposed line) and with the average line height over a span of 47 ft. (14.3 m).

Levels of audible noise, radio interference, and television interference are predicted for both fair and foul weather; however, corona is basically a foul-weather phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Along the route of the proposed Big Eddy -Knight transmission line, such conditions are expected to occur about 1 percent of the time during a year, based on hourly precipitation records during years with complete records for Moro, Oregon (2000-2003) and Kennewick,

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WA (2006-2008).(NOAA, 2010) Corona activity also increases with altitude. For purposes of evaluating corona effects from the proposed line, an altitude that corresponded to the average where each line configuration would be constructed was assumed for that configuration. Assumed altitudes ranged from 350 to 1650 ft. (100 to 500 m).

2.0 Physical Description

2.1 Proposed Line

The proposed 500-kV transmission line would be a three-phase, single-circuit line. Each phase is carried on a separate set of conductors (wires). For the 500-kV line, each phase actually is carried on a bundle of three conductors (wires) and there are three bundles per circuit as shown in Figure 2.

The voltage and current waves on each phase are displaced by 120° in time (one-third of a cycle) from the waves on the other phases. The proposed line would be placed either on single-circuit towers with the phases arranged in a delta (triangular) configuration (Figure 2) or on double-circuit towers with three of six phase conductors or bundles arranged vertically on either side of the tower (Figure 8). The double-circuit towers would support both the proposed line and an existing parallel lower voltage line or just the proposed line with the proposed line located on the west side of the double-circuit tower. For some configurations, the proposed line would be operated as a split-phase line. In this case, each phase is split between two bundles, one on either side of the double-circuit tower. A total of 13 configurations were identified for the project based on parallel lines, tower type and conductors.

BPA provided the physical and operating characteristics of the proposed and existing lines. The electrical characteristics and physical dimensions for the configurations of the proposed line are shown in Table 2 and the configurations are shown in Figures 2 to 12.

The maximum phase-to-phase voltage for the proposed line would be 550 kV and the average voltage would be 536 kV. The maximum electrical current on the line would be 970 amperes (A) per phase, based on the BPA projected system annual peak load in 2013 as the base year. The load factor for this line will be about 0.50 (average load = peak load x load factor), resulting in an average current of 485 A.

For most of the configurations each bundle of the proposed 500-kV line will have three 1.300-inch diameter conductors arranged in an inverted triangle bundle configuration with approximately 17-in. (43.3 cm) spacing between conductors. Some portions of the line could have slightly larger conductors to meet a BPA design criterion for audible noise performance. In this case, the conductor bundles would be comprised of three 1.600-inch diameter conductors arranged in an inverted triangle with approximately 19-in. (48.9 cm) spacing.

For the double-circuit tower configurations the east circuit on the tower would be strung with a 1x1.300-in conductor for configurations with an existing 115-kV circuit on that side. For the two configurations where an existing 230- or 345-kV line would be placed on the double-circuit tower, then a 3x1.300-in bundle would be used. The three-conductor bundle would also be used if the proposed 500-kV line was split between the two sides of the tower.

For the single-circuit tower with the phases arranged in a triangle or delta configuration, the horizontal spacing between phases in the lower conductor positions would be 46 ft. (14 m). The vertical spacing between the conductor positions would be 31.5 ft. (9.6 m).

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For the double-circuit tower the horizontal spacing between the top and bottom pairs of conductor bundles would be 36.5 ft. (11.1 m) and the spacing between the middle pair of conductor bundles would be 56.5 ft. (17.2 m). The vertical spacing between the bundles would be 36 ft. (11.0 m).

Minimum conductor-to-ground clearance would be 35 or 36 ft. (10.7 or 11.0 m) at a conductor temperature of 122°F (50°C). This temperature represents heavy operating conditions and high ambient air temperatures; clearances above ground would be greater under normal operating temperatures. The larger 36-foot clearance would be employed to ensure that the BPA criterion for maximum electric field at ground level (9 kV/m) is met along the entire route. The 35-foot clearance would be used for the single circuit towers except for Configuration 3 where it could be raised to 36 feet, depending on the relative phases of the proposed and adjacent 345-kV line. The 36-foot clearance would also be used for the double-circuit tower configurations (Configurations 7-12). The average clearance above ground along a span will be approximately 47 ft. (14.3 m); this value was used for corona calculations and to estimate average electric and magnetic fields along the line.

The minimum clearance of 35 ft (10.7-m) or greater provided by BPA exceeds the minimum distance of the conductors above ground required to meet the National Electric Safety Code (NESC) (IEEE, 2002). At road crossings, the ground clearance would be at least 50 ft. (15.2 m).

New right-of-way for the proposed line will be 150 ft. (46 m) wide. When placed on existing right-of-way the centerline of the proposed line will be at least 75 ft. (23 m) from the edge.

2.2 Existing Lines

The proposed Big Eddy – Knight 500-kV line would parallel existing transmission lines along parts of all three alternative routes. In all, there are five existing lines that could be paralleled: the Harvalum - Big Eddy 230-kV line, the McNary – Ross 345-kV line, the Chenowick – Goldendale 115-kV line, the Spearfish Tap 115-kV line and the Big Eddy – Spring Creek 230-kV line. The lines to be paralleled and lengths of their parallel segments are dependent on the route. Descriptions of the three routes and five existing lines and their associated routes are given in Tables 1 and 2.

3.0 Electric Field

3.1 Basic Concepts

An electric field is said to exist in a region of space if an electrical charge, at rest in that space, experiences a force of electrical origin (i.e., electric fields cause free charges to move). Electric field is a vector quantity: that is, it has both magnitude and direction. The direction corresponds to the direction that a positive charge would move in the field. Sources of electric fields are unbalanced electrical charges (positive or negative) and time-varying magnetic fields. Transmission lines, distribution lines, house wiring, and appliances generate electric fields in their vicinity because of the unbalanced electrical charges associated with voltage on the conductors. On the power system in North America, the voltage and charge on the energized conductors are cyclic (plus to minus to plus) at a rate of 60 times per second. This changing voltage results in electric fields near sources that are also time-varying at a frequency of 60 hertz (Hz; a frequency unit equivalent to cycles per second).

As noted earlier, electric fields are expressed in units of volts per meter (V/m) or kilovolts (thousands of volts) per meter (kV/m). Electric- and magnetic-field magnitudes in this report are expressed in root-

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mean-square (rms) units. For sinusoidal waves, the rms amplitude is given as the peak amplitude divided by the square root of two.

The spatial uniformity of an electric field depends on the source of the field and the distance from that source. On the ground, under a transmission line, the electric field is nearly constant in magnitude and direction over distances of several feet (1 meter). However, close to transmission- or distribution-line conductors, the field decreases rapidly with distance from the conductors. Similarly, near small sources such as appliances, the field is not uniform and falls off even more rapidly with distance from the device. If an energized conductor (source) is inside a grounded conducting enclosure, then the electric field outside the enclosure is zero, and the source is said to be shielded.

Electric fields interact with the charges in all matter, including living systems. When a conducting object, such as a vehicle or person, is located in a time-varying electric field near a transmission line, the external electric field exerts forces on the charges in the object, and electric fields and currents are induced in the object. If the object is grounded, then the total current induced in the body (the "short-circuit current") flows to earth. The distribution of the currents within, say, the human body, depends on the electrical conductivities of various parts of the body: for example, muscle and blood have higher conductivity than bone and would therefore experience higher currents.

At the boundary surface between air and the conducting object, the field in the air is perpendicular to the conductor surface and is much, much larger than the field in the conductor itself. For example, the average surface field on a human standing in a 10 kV/m field is 27 kV/m; the internal fields in the body are much smaller: approximately 0.008 V/m in the torso and 0.45 V/m in the ankles.

3.2 Transmission-line Electric Fields

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, towers, vegetation, buildings, vehicles, and people. The calculated strength of the electric field at a height of 3.28 ft. (1 m) above an unvegetated, flat earth is frequently used to describe the electric field under straight parallel transmission lines. The most important transmission-line parameters that determine the electric field at a 1-m height are conductor height above ground and line voltage.

Calculations of electric fields from transmission lines are performed with computer programs based on well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values under these conditions represent an ideal situation. When practical conditions approach this ideal model, measurements and calculations agree. Often, however, conditions are far from ideal because of variable terrain and vegetation. In these cases, fields are calculated for ideal conditions, with the lowest conductor clearances to provide upper bounds on the electric field under the transmission lines. With the use of more complex models or empirical results, it is also possible to account accurately for variations in conductor height, topography, and changes in line direction. Because the fields from different sources add vectorially, it is possible to compute the fields from several different lines if the electrical and geometrical properties of the lines are known. However, in general, electric fields near transmission lines with vegetation below are highly complex and cannot be calculated. Measured fields in such situations are highly variable.

For evaluation of EMF from transmission lines, the fields must be calculated for a specific line condition. The NESC states the condition for evaluating electric-field-induced short-circuit current for lines with voltage above 98 kV, line-to-ground, as follows: conductors are at a minimum clearance from ground corresponding to a conductor temperature of 120°F (50°C), and at a maximum voltage (IEEE, 2002). BPA has supplied the needed information for calculating electric and magnetic fields from the proposed

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transmission lines: the maximum operating voltage, the estimated peak current in 2013, and the minimum conductor clearances.

There are standard techniques for measuring transmission-line electric fields (IEEE, 1987). Provided that the conditions at a measurement site closely approximate those of the ideal situation assumed for calculations, measurements of electric fields agree well with the calculated values. If the ideal conditions are not approximated, the measured field can differ substantially from calculated values. Usually the actual electric field at ground level is reduced from the calculated values by various common objects that act as shields.

Maximum or peak field values occur over a small area at midspan, where conductors are closest to the ground (minimum clearance). As the location of an electric-field profile approaches a tower, the conductor clearance increases, and the peak field decreases. A grounded tower will reduce the electric field considerably by shielding.

For traditional transmission lines, such as the proposed line, where the right-of-way extends laterally well beyond the conductors, electric fields at the edge of the right-of-way are not as sensitive as the peak field to conductor height. Computed values at the edge of the right-of-way for any line height are fairly representative of what can be expected all along the transmission-line corridor. However, the presence of vegetation on and at the edge of the right-of-way will reduce actual electric-field levels below calculated values.

3.3 Calculated Values of Electric Fields

Table 3 shows the calculated values of electric field at 3.28 ft. (1 m) above ground for the proposed Big Eddy - Knight 500-kV transmission-line configurations. The maximum value on the right-of-way and the value at the edge of the right-of-way are given for the proposed configurations at minimum conductor clearance and at the estimated average clearance along a span. Both the maximum and average fields were computed with the line operating at the maximum voltage of 550 kV. Lateral profiles of the electric fields for the 13 configurations are shown in Figures 13 – 24.

The calculated maximum electric fields expected on the right-of-way of the proposed line range from 7.4 to 8.8 kV/m, depending on the configuration. For average clearance, the peak field ranges from 4.2 to 5.8 kV/m. As shown in Figures 13 to 24, the peak values would be present only at locations directly under the line, near mid-span, where the conductors are at the minimum clearance. The conditions of minimum conductor clearance at maximum current and maximum voltage occur very infrequently. The calculated peak levels are rarely reached under real-life conditions, because the actual line height is generally above the minimum value used in the computer model, because the actual voltage is below the maximum value used in the model, and because vegetation within and near the edge of the right-of-way tends to shield the field at ground level.

The average values expected at the edge of the right-of-way of the proposed line range from 2.4 to less than 0.1 kV/m. The largest field values at the edge of the right-of-way occur for configurations where the centerline of the proposed single-circuit delta tower is located 75 ft from the edge.

For comparison the electric fields along the existing corridors for the No-action alternative are also shown in Table 3. For the existing lines the maximum fields range from 0 to 4.5 kV/m and the average peak field ranges from 0 to 2.6 kV/m. Average fields at the edge of the right-of-way vary from 0 to 1.3 kV/m for the No-action alternative. The principal reason for the lower fields in the No-action alternative is the absence of a 500-kV line among the existing lines.

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3.4 Environmental Electric Fields

The electric fields associated with the proposed Big Eddy - Knight transmission line can be compared with those found in other environments. Sources of 60-Hz electric (and magnetic) fields exist everywhere electricity is used; levels of these fields in the modern environment vary over a wide range. Electric-field levels associated with the use of electrical energy are orders of magnitude greater than the naturally occurring 60-Hz fields of about 0.0001 V/m, which stem from atmospheric and extraterrestrial sources.

Electric fields in outdoor, publicly accessible places range from less than 1 V/m to 12 kV/m; the large fields exist close to high-voltage transmission lines of 500 kV or higher. In remote areas without electrical service, 60-Hz field levels can be much lower than 1 V/m. Electric fields in home and work environments generally are not spatially uniform like those of transmission lines; therefore, care must be taken when making comparisons between fields from different sources such as appliances and electric lines. In addition, fields from all sources can be strongly modified by the presence of conducting objects. However, it is helpful to know the levels of electric fields generated in domestic and office environments in order to compare commonly experienced field levels with those near transmission lines.

Numerous measurements of residential electric fields have been reported for various parts of the United States, Canada, and Europe. Although there have been no large studies of residential electric fields, sufficient data are available to indicate field levels and characteristics. Measurements of domestic 60-Hz electric fields indicate that levels are highly variable and source-dependent. Electric-field levels are not easily predicted because walls and other objects act as shields, because conducting objects perturb the field, and because homes contain numerous localized sources. Internal sources (wiring, fixtures, and appliances) seem to predominate in producing electric fields inside houses. Average measured electric fields in residences are generally in the range of 5 to 20 V/m. In a large occupational exposure monitoring project that included electric-field measurements at homes, average exposures for all groups away from work were generally less than 10 V/m (Bracken, 1990).

Electric fields from household appliances are localized and decrease rapidly with distance from the source. Local electric fields measured at 1 ft. (0.3 m) from small household appliances are typically in the range of 30 to 60 V/m. In a survey, reported by Deno and Zaffanella (1982), field measurements at a 1-ft. (0.3-m) distance from common domestic and workshop sources were found to range from 3 to 70 V/m. The localized fields from appliances are not uniform, and care should be taken in comparing them with transmission-line fields.

Electric blankets can generate higher localized electric fields. Sheppard and Eisenbud (1977) reported fields of 250 V/m at a distance of approximately 1 ft. (0.3 m). Florig et al. (1987) carried out extensive empirical and theoretical analysis of electric-field exposure from electric blankets and presented results in terms of uniform equivalent fields such as those near transmission lines. Depending on what parameter was chosen to represent intensity of exposure and the grounding status of the subject, the equivalent vertical 60-Hz electric-field exposure ranged from 20 to over 3500 V/m. The largest equivalent field corresponds to the measured field on the chest with the blanket-user grounded. The average field on the chest of an ungrounded blanket-user yields an equivalent vertical field of 960 V/m. As manufacturers have become aware of the controversy surrounding EMF exposures, electric blankets have been redesigned to reduce magnetic fields. However, electric fields from these "low field" blankets are still comparable with those from older designs (Bassen et al., 1991).

Generally, people in occupations not directly related to high-voltage equipment are exposed to electric fields comparable with those of residential exposures. For example, the average electric field measured in 14 commercial and retail locations in rural Wisconsin and Michigan was 4.8 V/m (IIT Research Institute, 1984). Median electric field was about 3.4 V/m. These values are about one-third the values in

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residences reported in the same study. Electric-field levels in public buildings such as shops, offices, and malls appear to be comparable with levels in residences.

In a survey of 1,882 volunteers from utilities, electric-field exposures were measured for 2,082 work days and 657 non-work days (Bracken, 1990). Electric-field exposures for occupations other than those directly related to high-voltage equipment were equivalent to those for non-work exposure.

Thus, except for the relatively few occupations where high-voltage sources are prevalent, electric fields encountered in the workplace are probably similar to those of residential exposures. Even in electric utility occupations where high field sources are present, exposures to high fields are limited on average to minutes per day.

Electric fields found in publicly accessible areas near high-voltage transmission lines can typically range up to 3 kV/m for 230-kV lines, to 10 kV/m for 500-kV lines, and to 12 kV/m for 765-kV lines. Although these peak levels are considerably higher than the levels found in other public areas, they are present only in limited areas on rights-of-way.

The calculated electric fields for the proposed Big Eddy – Knight 500-kV transmission line are consistent with the levels reported for other 500-kV transmission lines in Washington, Oregon and elsewhere. The calculated electric fields on the right-of-way of the proposed transmission line would be much higher than levels normally encountered in residences and offices.

4.0 Magnetic Field

4.1 Basic Concepts

Magnetic fields can be characterized by the force they exert on a moving charge or on an electrical current. As with the electric field, the magnetic field is a vector quantity characterized by both magnitude and direction. Electrical currents generate magnetic fields. In the case of transmission lines, distribution lines, house wiring, and appliances, the 60-Hz electric current flowing in the conductors generates a time-varying, 60-Hz magnetic field in the vicinity of these sources. The strength of a magnetic field is measured in terms of magnetic lines of force per unit area, or magnetic flux density. The term “magnetic field,” as used here, is synonymous with magnetic flux density and is expressed in units of gauss (G) or milligauss (mG). (The tesla (T) is the unit of magnetic flux density preferred in scientific publications, where 1.0 gauss equals one ten-thousandth of a tesla (0.1 mT) and 1.0 mG equals 0.1 microtesla [μ T]).

The uniformity of a magnetic field depends on the nature and proximity of the source, just as the uniformity of an electric field does. Transmission-line-generated magnetic fields are quite uniform over horizontal and vertical distances of several feet near the ground. However, for small sources such as appliances, the magnetic field decreases rapidly over distances comparable with the size of the device.

The interaction of a time-varying magnetic field with conducting objects results in induced electric fields and currents in the object. A changing magnetic field through an area generates a voltage around any conducting loop enclosing the area (Faraday's law). This is the physical basis for the operation of an electrical transformer. For a time-varying sinusoidal magnetic field, the magnitude of the induced voltage around the loop is proportional to the area of the loop, the frequency of the field, and the magnitude of the field. The induced voltage around the loop results in an induced electric field and current flow in the loop material. The induced current that flows in the loop depends on the conductivity of the loop as well as its area.

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4.2 Transmission-line Magnetic Fields

The magnetic field generated by currents on transmission-line conductors extends from the conductors through the air and into the ground. The magnitude of the field at a height of 3.28 ft. (1 m) is frequently used to describe the magnetic field under transmission lines. Because the magnetic field is not affected by non-ferrous materials, the field is not influenced by normal objects on the ground under the line. The direction of the maximum field varies with location. (The electric field, by contrast, is essentially vertical near the ground.) The most important transmission-line parameters that determine the magnetic field at 3.28 ft. (1 m) height are conductor height above ground and magnitude of the currents flowing in the conductors. As distance from the transmission-line conductors increases, the magnetic field decreases.

Calculations of magnetic fields from transmission lines are performed using well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values usually represent the ideal straight parallel-conductor configuration. For simplicity, a flat earth is usually assumed. Balanced currents (currents of the same magnitude for each phase) are also assumed. This is usually valid for transmission lines, where loads on all three phases are maintained in balance during operation. Induced image currents in the earth are usually ignored for calculations of magnetic field under or near the right-of-way. The resulting error is negligible. Only at distances greater than 300 ft. (91 m) from a line do such contributions become significant (Deno and Zaffanella, 1982). The clearance for magnetic-field calculations for the proposed line was the same as that used for electric-field evaluations.

Standard techniques for measuring magnetic fields near transmission lines are described in ANSI IEEE Standard No. 644-1994 (1994). Measured magnetic fields agree well with calculated values, provided the currents and line heights that go into the calculation correspond to the actual values for the line. To realize such agreement, it is necessary to get accurate current readings during field measurements (because currents on transmission lines can vary considerably over short periods of time) and also to account for all field sources in the vicinity of the measurements.

As with electric fields, the maximum or peak magnetic fields occur in areas near the centerline and at midspan where the conductors are the lowest. The magnetic field at the edge of the right-of-way is not very dependent on line height. If more than one line is present, the peak field will depend on the relative electrical phasing of the conductors and the relative direction of power flow in the lines.

4.3 Calculated Values for Magnetic Fields

Table 4 gives the calculated values of the magnetic field at 3.28 ft. (1 m) height for the proposed 500-kV transmission-line configurations. Field values on the right-of-way and at the edge of the right-of-way are given for projected maximum currents and minimum clearance during system annual peak load in 2013. Field levels at the same locations for average current and average conductor clearance are also given. The projected maximum currents are 970 A on each of the three phases of the proposed line. For double-circuit configurations where the phases are split between two sets of conductors, the maximum current on each set of conductors would be 485 A. Average currents over the year would be about 50 percent of the maximum values.

Figures 25 to 38 show lateral profiles of magnetic fields under these same current and clearance conditions for the proposed 500-kV transmission line and the existing adjacent lines. The levels for maximum current and minimum clearance shown in the figures represent the highest magnetic fields under the proposed Big Eddy – Knight 500-kV line except under extreme temperature conditions. The actual day-to-day magnetic-field levels would be lower. They would vary as currents change daily and seasonally and as clearances change with ambient temperature. As shown in the figures, the average

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fields along the line over a year would be considerably reduced from the maximum values, as a result of increased clearances and reduced current.

The maximum calculated 60-Hz magnetic fields expected at 3.28 ft. (1 m) above ground for the proposed line range from 219mG to 60 mG for the 13 configurations of the proposed line. The highest fields would occur for single and double circuit towers that are adjacent to the existing Harvalum - Big Eddy 230-kV line (Configurations 2, 3 and 9). The lowest maximum fields would occur for the double-circuit tower configurations with split-phasing (Configurations 7 and 12). Maximum fields on the existing rights-of-way would range from 176 to 0 mG should the proposed line not be built – the No-action alternative. The maximum fields in this case would occur under the existing Big Eddy – Spring Creek and Harvalum - Big Eddy 230-kV lines.

The estimated average peak fields on the right-of-way for the proposed line would range from 65 to 17 mG. The average peak field on the existing rights-of-way would range from 48 to 0 mG for the No-action alternative.

At the edge of the right-of-way of the proposed line (on new right-of-way with no adjacent lines), estimated maximum fields would be 42 mG for the single-circuit tower (Configuration 1), 14 mG for the double-circuit tower with split phasing (Configurations 7) and 52 mG for the double-circuit tower with a single circuit on one side (Configurations 7A and 10). The peak average fields at the edge of the right-of-way for these configurations would be 18, 6, and 21 mG, respectively.

On existing rights-of-way with parallel adjacent lines, the calculated levels at the edge of the right-of-way obviously depend on the width of the right-of-way and the current on the existing line. Consequently, on existing rights-of-way, the maximum magnetic field at the edge of the right-of-way for maximum current conditions would range from 67 to less than 1 mG, while the average field at the edge would range from 23 to less than 1 mG. The maximum edge of right-of-way values for the No-action alternative would range from 67 to 0 mG, while the average values range from 23 to 0 mG. The highest edge of right-of-way levels for the No-action alternative occur adjacent to the Harvalum - Big Eddy and Big Eddy - Spring Creek 230-kV lines.

The magnetic field falls off rapidly as distance from the line increases. At a distance of 200 ft. (61 m) from the centerline of the proposed single-circuit tower line with maximum current, the field would be 6.4 mG and the average field would be about 3 mG. At the same current and distance from the double-circuit tower with the split phase configuration, the maximum and average fields would be less than 2 mG. For the double-circuit tower with only a single-circuit on one side, the maximum and average fields at 200 feet would be about 10 and 3 mG, respectively. The largest maximum and average fields at 200 feet from the existing lines for the No-action alternative would be 6-7 mG and 2-4 mG, respectively. These largest values for existing lines would occur adjacent to the Harvalum - Big Eddy 230-kV line, the Big Eddy – Spring Creek 230-kV line, and the McNary – Ross 345-kV line.

There would 2 to 5 houses within 300 feet of the proposed centerline and 10 to 12 houses within 500 ft, depending on which route and line designs are selected (Table 5). The average magnetic fields at these houses would range from 0.5 to 22.3 mG for the single-circuit configuration routes and from 0.1 to 3.5 mG for the double circuit routes. The range of maximum fields would be from 1.1 to 45 mG for the single-circuit routes and from 0.2 to 7 mG for the double circuit routes. (Note: A single house at 71 ft from the centerline of the proposed single-circuit configuration contributes the high upper ranges of average and maximum fields for the East and Middle alternatives shown in Table 5.)

In general, magnetic fields at houses would be higher for the East and Middle alternatives than for the West alternative when single circuit configurations are used. The opposite would be true if double-circuit

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configurations were used: in this case, magnetic fields would be higher at houses along the West alternative than along the other two routes.

4.4 Environmental Magnetic Fields

Transmission lines are not the only source of magnetic fields; as with 60-Hz electric fields, 60-Hz magnetic fields are present throughout the environment of a society that relies on electricity as a principal energy source. The magnetic fields associated with the proposed Big Eddy - Knight 500 kV line can be compared with fields from other sources. The range of 60-Hz magnetic-field exposures in publicly accessible locations such as open spaces, transmission-line rights-of-way, streets, pedestrian walkways, parks, shopping malls, parking lots, shops, hotels, public transportation, and so on range from less than 0.1 mG to about 1 G, with the highest values occurring near small appliances with electric motors. In occupational settings in electric utilities, where high currents are present, magnetic-field exposures for workers can be above 1 G. At 60 Hz, the magnitude of the natural magnetic field is approximately 0.0005 mG.

Several investigations of residential fields have been conducted. In a large study to identify and quantify significant sources of 60-Hz magnetic fields in residences, measurements were made in 996 houses, randomly selected throughout the country (Zaffanella, 1993). The most common sources of residential fields were power lines, the grounding system of residences, and appliances. Field levels were characterized by both point-in-time (spot) measurements and 24-hour measurements. Spot measurements averaged over all rooms in a house exceeded 0.6 mG in 50 percent of the houses and 2.9 mG in 5 percent of houses. Power lines generally produced the largest average fields in a house over a 24-hour period. On the other hand, grounding system currents proved to be a more significant source of the highest fields in a house. Appliances were found to produce the highest local fields; however, fields fell off rapidly with increased distance. For example, the median field near microwave ovens was 36.9 mG at a distance of 10.5 in (0.27 m) and 2.1 mG at 46 in (1.17 m). Across the entire sample of 996 houses, higher magnetic fields were found in, among others, urban areas (vs. rural); multi-unit dwellings (vs. single-family); old houses (vs. new); and houses with grounding to a municipal water system.

In an extensive measurement project to characterize the magnetic-field exposure of the general population, over 1000 randomly selected persons in the United States wore a personal exposure meter for 24 hours and recorded their location in a simple diary (Zaffanella and Kalton, 1998). Based on the measurements of 853 persons, the estimated 24-hour average exposure for the general population is 1.24 mG and the estimated median exposure is 0.88 mG. The average field “at home, not in bed” is 1.27 mG and “at home, in bed” is 1.11 mG. Average personal exposures were found to be largest “at work” (mean of 1.79 mG and median of 1.01 mG) and lowest “at home, in bed” (mean of 1.11 mG and median of 0.49 mG). Average fields in school were also low (mean of 0.88 mG and median of 0.69 mG). Factors associated with higher exposures at home were smaller residences, duplexes and apartments, metallic rather than plastic water pipes, and nearby overhead distribution lines.

As noted above, magnetic fields from appliances are localized and decrease rapidly with distance from the source. Localized 60-Hz magnetic fields have been measured near about 100 household appliances such as ranges, refrigerators, electric drills, food mixers, and shavers (Gauger, 1985). At a distance of 1 ft. (0.3 m), the maximum magnetic field ranged from 0.3 to 270 mG, with 95 percent of the measurements below 100 mG. Ninety-five percent of the levels at a distance of 4.9 ft. (1.5 m) were less than 1 mG. Devices that use light-weight, high-torque motors with little magnetic shielding exhibited the largest fields. These included vacuum cleaners and small hand-held appliances and tools. Microwave ovens with large power transformers also exhibited relatively large fields. Electric blankets have been a much-studied source of magnetic-field exposure because of the length of time they are used and because of the close proximity to the body. Florig and Hoburg (1988) estimated that the average magnetic field in

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a person using an electric blanket was 15 mG, and that the maximum field could be 100 mG. New "low-field" blankets have magnetic fields at least 10 times lower than those from conventional blankets (Bassen et al., 1991).

In a domestic magnetic-field survey, Silva et al. (1989) measured fields near different appliances at locations typifying normal use (e.g., sitting at a typewriter or standing at a stove). Specific appliances with relatively large fields included can openers (n = 9), with typical fields ranging from 30 to 225 mG and a maximum value up to 2.7 G; shavers (n = 4), with typical fields from 50 to 300 mG and maximum fields up to 6.9 G; and electric drills (n = 2), with typical fields from 56 to 190 mG and maximum fields up to 1.5 G. The fields from such appliances fall off very rapidly with distance and are only present for short periods. Thus, although instantaneous magnetic-field levels close to small hand-held appliances can be quite large, they do not contribute to average area levels in residences. The technology of newer energy-efficient appliances is likely to reduce fields from appliances further.

Although studies of residential magnetic fields have not all considered the same independent parameters, the following consistent characterization of residential magnetic fields emerges from the data:

- (1) External sources play a large role in determining residential magnetic-field levels. Transmission lines, when nearby, are an important external source. Unbalanced ground currents on neutral conductors and other conductors, such as water pipes in and near a house, can represent a significant source of magnetic field. Distribution lines per se, unless they are quite close to a residence, do not appear to be a traditional distance-dependent source.
- (2) Homes with overhead electrical service appear to have higher average fields than those with underground service.
- (3) Appliances represent a localized source of magnetic fields that can be much higher than average or area fields. However, fields from appliances approach area levels at distances greater than 3 ft. (1 m) from the device.

Although important variables in determining residential magnetic fields have been identified, quantification and modeling of their influence on fields at specific locations is not yet possible. However, a general characterization of residential magnetic-field level is possible: average levels in the United States are in the range of 0.5 to 1.0 mG, with the average field in a small number of homes exceeding this range by as much as a factor of 10 or more. Average personal exposure levels are slightly higher, possibly due to use of appliances and varying distances to other sources. Maximum fields can be much higher.

Magnetic fields in commercial and retail locations are comparable with those in residences. As with appliances, certain equipment or machines can be a local source of higher magnetic fields. Utility workers who work close to transformers, generators, cables, transmission lines, and distribution systems clearly experience high-level fields. Other sources of fields in the workplace include motors, welding machines, computers, and office equipment. In publicly accessible indoor areas, such as offices and stores, field levels are generally comparable with residential levels, unless a high-current source is nearby.

Because high-current sources of magnetic field are more prevalent than high-voltage sources, occupational environments with relatively high magnetic fields encompass a more diverse set of occupations than do those with high electric fields. For example, in occupational magnetic-field measurements reported by Bowman et al. (1988), the geometric mean field from 105 measurements of magnetic field in "electrical worker" job locations was 5.0 mG. "Electrical worker" environments showed the following elevated magnetic-field levels (geometric mean greater than 20 mG): industrial power supplies, alternating current (ac) welding machines, and sputtering systems for electronic assembly.

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Measurements of personal exposure to magnetic fields were made for 1,882 volunteer utility workers for a total of 4,411 workdays (Bracken, 1990). Median workday mean exposures ranged from 0.5 mG for clerical workers without computers to 7.2 mG for substation operators. Occupations not specifically associated with transmission and distribution facilities had median workday exposures less than 1.5 mG, while those associated with such facilities had median exposures above 2.3 mG. Magnetic-field exposures measured in homes during this study were comparable with those recorded in offices.

Magnetic fields in publicly accessible outdoor areas seem to be, as expected, directly related to proximity to electric-power transmission and distribution facilities. Near such facilities, magnetic fields are generally higher than indoors (residential). Higher-voltage facilities tend to have higher fields. Typical maximum magnetic fields in publicly accessible areas near transmission facilities can range from less than a few milligauss up to 300 mG or more, near heavily loaded lines operated at 230 to 765 kV. The levels depend on the line load, conductor height, and location on the right-of-way. Because magnetic fields near high-voltage transmission lines depend on the current in the line, they can vary daily and seasonally.

Fields near distribution lines and equipment are generally lower than those near transmission lines. Measurements in Montreal indicated that typical fields directly above underground distribution systems were 5 to 19 mG (Heroux, 1987). Beneath overhead distribution lines, typical fields were 1.5 to 5 mG on the primary side of the transformer, and 4 to 10 mG on the secondary side. Near ground-based transformers used in residential areas, fields were 80 to 1000 mG at the surface and 10 to 100 mG at a distance of 1 ft. (0.3 m).

The magnetic fields from the proposed line would be comparable to or less than those from existing 500-kV lines in Washington and elsewhere. On and near the right-of-way of the proposed line, magnetic fields would be well above average residential levels. However, the fields from the line would decrease rapidly and approach common ambient levels at distances greater than a few hundred feet from the line. Furthermore, the fields at the edge of the right-of-way would not be above those encountered during normal activities near common sources such as hand-held appliances.

5.0 Electric and Magnetic Field (EMF) Effects

Possible effects associated with the interaction of EMF from transmission lines with people on and near a right-of-way fall into two categories: short-term effects that can be perceived and may represent a nuisance, and possible long-term health effects. Only short-term effects are discussed here. The issue of whether there are long-term health effects associated with transmission-line fields is controversial. In recent years, considerable research on possible biological effects of EMF has been conducted. A review of these studies and their implications for health-related effects is provided in a separate technical report for the environmental assessment for the proposed Big Eddy – Knight 500-kV transmission line (Exponent, 2009).

5.1 Electric Fields: Short-term Effects

Short-term effects from transmission-line electric fields are associated with perception of induced currents and voltages or perception of the field. Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. These effects could occur infrequently under the proposed Big Eddy - Knight 500-kV line.

Steady-state currents are those that flow continuously after a person contacts an object and provides a path to ground for the induced current. The amplitude of the steady-state current depends on the induced

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current to the object in question and on the grounding path. The magnitude of the induced current to vehicles and objects under the proposed line will depend on the electric-field strength and the size and shape of the object. When an object is electrically grounded, the voltage on the object is reduced to zero, and it is not a source of current or voltage shocks. If the object is poorly grounded or not grounded at all, then it acquires some voltage relative to earth and is a possible source of current or voltage shocks.

The responses of persons to steady-state current shocks have been extensively studied, and levels of response documented (Keeseey and Letcher, 1969; IEEE, 1978). Primary shocks are those that can result in direct physiological harm. Such shocks will not be possible from induced currents under the existing or proposed lines, because clearances above ground required by the NESC preclude such shocks from large vehicles and grounding practices eliminate large stationary objects as sources of such shocks.

Secondary shocks are defined as those that could cause an involuntary and potentially harmful movement, but no direct physiological harm. Secondary shocks could occur under the proposed 500-kV line when making contact with ungrounded conducting objects such as vehicles or equipment. However, such occurrences are anticipated to be very infrequent. Shocks, when they occur under the 500-kV line, are most likely to be below the nuisance level. Induced currents are extremely unlikely to be perceived off the right-of-way of the proposed line.

Induced currents are always present in electric fields under transmission lines and will be present near the proposed line. However, during initial construction, BPA routinely grounds metal objects that are located on or near the right-of-way. The grounding eliminates these objects as sources of induced current and voltage shocks. Multiple grounding points are used to provide redundant paths for induced current flow. After construction, BPA would respond to any complaints and install or repair grounding to mitigate nuisance shocks.

Unlike fences or buildings, mobile objects such as vehicles and farm machinery cannot be grounded permanently. Limiting the possibility of induced currents from such objects to persons is accomplished in several ways. First, required clearances for above-ground conductors tend to limit field strengths to levels that do not represent a hazard or nuisance. The NESC (2002) requires that, for lines with voltage exceeding 98 kV line-to-ground (170 kV line-to-line), sufficient conductor clearance be maintained to limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 milliamperes (mA) or less. This can be accomplished by limiting access or by increasing conductor clearances in areas where large vehicles could be present. BPA and other utilities design and operate lines to be in compliance with the NESC.

For the proposed line, conductor clearances at 50°C conductor temperature would be increased to at least 50 ft. (15.2 m) over road crossings along the route to meet the BPA requirement that electric fields be less than 5.0 kV/m at road crossings. The actual clearance to meet the criterion would depend on the configuration and parallel lines. For example, in order for Configuration 3 to meet the 5.0 kV/m criterion at a clearance of 50 feet, adjacent phases of the proposed Big Eddy – Knight 500-kV line and the existing McNary – Ross 345-kV line could not be the same; for Configurations 7A and 10 clearance would have to be increased to 54 feet to meet the 5.0 kV/m criterion. In any case, the conductor clearance at each road crossing would be checked during the line design stage to ensure that the BPA 5-kV/m and NESC 5-mA criteria are met. Line clearances would also be increased in accordance with the NESC, such as over railroads and water areas suitable for sailboating.

The largest truck allowed on roads in Oregon and Washington without a special permit is 14 feet high by 8.5 feet wide by 75 feet long (4.3 x 2.6 x 22.9 m). The induced currents to such a vehicle oriented perpendicular to the line in a maximum field of 5 kV/m (at 3.28-foot height) would be 4.5 mA (Reilly, 1979). For smaller trucks, the maximum induced currents for perpendicular orientation to the proposed

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line would be less than this value. (Larger special-permitted trucks, such as triple trailers, can be up to 105 feet in length, but are not expected on the roads crossed by the proposed line. However, because they average the field over such a long distance, the maximum induced current to a 105-foot vehicle oriented perpendicular to the 500-kV line at a road crossing would be less than 4.5 mA.) Thus, the NESC 5-mA criterion would be met for perpendicular road crossings of the proposed line. These large vehicles are not anticipated to be off highways or oriented parallel and on the right-of-way of the proposed line. As discussed below, these are worst-case estimates of induced currents at road crossings; conditions for their occurrence are rare.

Several factors tend to reduce the levels of induced current shocks from vehicles:

- (1) Activities are distributed over the whole right-of-way, and only a small percentage of time is spent in areas where the field is at or close to the maximum value.
- (2) At road crossings, vehicles are aligned perpendicular to the conductors, resulting in a substantial reduction in induced current.
- (3) The conductor clearance at road crossings may not be at minimum values because of lower conductor temperatures and/or location of the road crossing away from midspan.
- (4) The largest vehicles are permitted only on certain highways.
- (5) Off-road vehicles are in contact with soil or vegetation, which reduces shock currents substantially.

Induced voltages occur on objects, such as vehicles, in an electric field where there is an inadequate electrical ground. If the voltage is sufficiently high, then a spark discharge shock can occur as contact is made with the object. Such shocks are similar to "carpet" shocks that occur, for example, when a person touches a doorknob after walking across a carpet on a dry day. The number and severity of spark discharge shocks depend on electric-field strength. Based on the low frequency of complaints reported by Glasgow and Carstensen (1981) for 500-kV ac transmission lines (one complaint per year for each 1,500 mi. or 2400 km of 500-kV line), nuisance shocks, which are primarily spark discharges, do not appear to be a serious impediment to allowed activities under 500-kV lines. Recommended safety practices and restricted activities on BPA transmission line rights-of-way are described in the BPA booklet "Living and Working Safely Around High-Voltage Transmission Lines" (USDOE, 2007).

In electric fields higher than will occur under the proposed line, it is theoretically possible for a spark discharge from the induced voltage on a large vehicle to ignite gasoline vapor during refueling. The probability for exactly the right conditions to occur for ignition is extremely remote. The additional clearance of conductors provided at road crossings reduces the electric field in areas where vehicles are prevalent and reduces the chances for such events. Even so, BPA recommends that vehicles should not be refueled under the proposed line unless specific precautions are taken to ground the vehicle and the fueling source (USDOE, 2007).

Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. The median field for perception in this manner was 7 kV/m for 136 persons; only about 12 percent could perceive fields of 2 kV/m or less (Deno and Zaffanella, 1982). In areas under the conductors at midspan, the fields at ground level would exceed the levels where field perception normally occurs. In these instances, field perception could occur on the right-of-way of the proposed line. It is unlikely that the field would be perceived beyond the edge of the right-of-way. Where vegetation provides shielding, the field would not be perceived.

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Conductive shielding reduces both the electric field and induced effects such as shocks. Persons inside a vehicle cab or canopy are shielded from the electric field. Similarly, a row of trees or a lower-voltage distribution line reduces the field on the ground in the vicinity. Metal pipes, wiring, and other conductors in a residence or building shield the interior from the transmission-line electric field.

The electric fields from the proposed 500-kV line would be comparable to those from existing 500-kV lines in the project area and elsewhere. Potential impacts of electric fields can be mitigated through grounding policies, adherence to the NESC, and increased clearances above the minimums specified by the NESC. Worst-case levels are used for safety analyses but, in practice, induced currents and voltages are reduced considerably by unintentional grounding. Shielding by conducting objects, such as vehicles and vegetation, also reduces the potential for electric-field effects.

5.2 Magnetic Field: Short-term Effects

Magnetic fields associated with transmission and distribution systems can induce voltage and current in long conducting objects that are parallel to the transmission line. As with electric-field induction, these induced voltages and currents are a potential source of shocks. A fence, irrigation pipe, pipeline, electrical distribution line, or telephone line forms a conducting loop when it is grounded at both ends. The earth forms the other portion of the loop. The magnetic field from a transmission line can induce a current to flow in such a loop if it is oriented parallel to the line. If only one end of the fence is grounded, then an induced voltage appears across the open end of the loop. The possibility for a shock exists if a person closes the loop at the open end by contacting both the ground and the conductor. The magnitude of this potential shock depends on the following factors: the magnitude of the field; the length of the object (the longer the object, the larger the induced voltage); the orientation of the object with respect to the transmission line (parallel as opposed to perpendicular, where no induction would occur); and the amount of electrical resistance in the loop (high resistance limits the current flow).

Magnetically induced currents from power lines have been investigated for many years; calculation methods and mitigating measures are available. A comprehensive study of gas pipelines near transmission lines developed prediction methods and mitigation techniques specifically for induced voltages on pipelines (Dabkowski and Taflove, 1979; Taflove and Dabkowski, 1979). Similar techniques and procedures are available for irrigation pipes and fences. Grounding policies employed by utilities for long fences reduce the potential magnitude of induced voltage.

The magnitude of the coupling with both pipes and fences is very dependent on the electrical unbalance (unequal currents) among the three phases of the line. Thus, a distribution line where a phase outage may go unnoticed for long periods of time can represent a larger source of induced currents than a transmission line where the loads are well-balanced (Jaffa and Stewart, 1981).

Knowledge of the phenomenon, grounding practices, and the availability of mitigation measures mean that magnetic-induction effects from the proposed 500-kV transmission line will be minimal.

Magnetic fields from transmission and distribution facilities can interfere with certain electronic equipment. Magnetic fields have been observed to cause distortion of the image on older VDTs and computer monitors that employ cathode ray tubes. This can occur in fields as low as 10 mG, depending on the type and size of the monitor (Baishiki et al., 1990; Banfai et al., 2000). Generally, the problem arose when computer monitors were in use near electrical distribution facilities in large office buildings. Contemporary display devices using flat-panel technologies, such as liquid-crystal or plasma displays are not affected.

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Interference from magnetic fields can be eliminated by shielding the affected device or moving it to an area with lower fields. Interference from 60-Hz fields with computers and control circuits in vehicles and other equipment is not anticipated at the field levels found under and near the proposed 500-kV transmission line.

The magnetic fields from the proposed line will be comparable to those from existing 500-kV lines in the area of the proposed line.

6.0 Regulations

Regulations that apply to transmission-line electric and magnetic fields fall into two categories. Safety standards or codes are intended to limit or eliminate electric shocks that could seriously injure or kill persons. Field limits or guidelines are intended to limit electric- and magnetic-field exposures that can cause nuisance shocks or might cause health effects. In no case has a limit or standard been established because of a known or demonstrated health effect.

The proposed line would be designed to meet the NESC (IEEE, 2002), which specifies how far transmission-line conductors must be from the ground and other objects. The clearances specified in the code provide safe distances that prevent harmful shocks to workers and the public. In addition, people who live and work near transmission lines must be aware of safety precautions to avoid electrical (which is not necessarily physical) contact with the conductors. For example, farmers should not up-end irrigation pipes under a transmission or other electrical line. In addition, as a matter of safety, the NESC specifies that electric-field-induced currents from transmission lines to vehicles must be below the 5 mA (“let go”) threshold deemed a lower limit for primary shock. BPA publishes and distributes a booklet that describes safe practices to protect against shock hazards around power lines (USDOE, 2007).

Field limits or guidelines have been adopted in several states and countries and by national and international organizations (Maddock, 1992). Electric-field limits have generally been based on minimizing nuisance shocks or field perception. The intent of magnetic-field limits has been to limit exposures to existing levels, given the uncertainty of their potential for health effects.

General guidelines for EMF exposure have been established for occupational and public exposure by national and international organizations. The limits established by three such guidelines are described in Table 5.

The American Conference of Governmental Industrial Hygienists (ACGIH) sets guidelines (Threshold Limit Values or TLVs) for occupational exposures to environmental agents (ACGIH, 2008). In general, a TLV represents the level below which it is believed that nearly all workers may be exposed repeatedly without adverse health effects. For EMF, the TLVs represent ceiling levels. For 60-Hz electric fields, occupational exposures should not exceed the TLV of 25 kV/m. However, the ACGIH also recognizes the potential for startle reactions from spark discharges and short-circuit currents in fields greater than 5-7 kV/m, and recommends implementing grounding practices. They recommend the use of conductive clothing for work in fields exceeding 15 kV/m. The TLV for occupational exposure to 60-Hz magnetic fields is a ceiling level of 10 G (10,000 mG) (ACGIH, 2008).

The International Committee on Non-ionizing Radiation Protection (ICNIRP), working in cooperation with the World Health Organization (WHO) has developed guidelines for occupational and public exposures to EMF (ICNIRP, 1998). For occupational exposures at 60 Hz, the recommended limits to exposure are 8.3 kV/m for electric fields and 4.2 G (4,200 mG) for magnetic fields. The electric-field level can be exceeded, provided precautions are taken to prevent spark discharge and induced current

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shocks. For the general public, the ICNIRP guidelines recommend exposure limits of 4.2 kV/m for electric fields and 0.83 G (830 mG) for magnetic fields (ICNIRP, 1998).

More recently the International Committee on Electromagnetic Safety (ICES) under the auspices of the IEEE has established exposure guidelines for 60-Hz electric and magnetic fields (ICES, 2002). The ICES recommended limits for occupational exposures are 20 kV/m for electric fields and 27,100 mG for magnetic fields. The recommended limits for the general public are lower: 5 kV/m for the general public, except on power line rights-of-way where the limit is 10 kV/m; and 9,040 mG for magnetic fields.

Electric and magnetic fields from various sources (including automobile ignitions, appliances and, possibly, transmission lines) can interfere with implanted cardiac pacemakers. In light of this potential problem, manufacturers design devices to be immune from such interference. However, research has shown that these efforts have not been completely successful and that a few models of older pacemakers still in use could be affected by 60-Hz fields from transmission lines. There were also numerous models of pacemakers that were not affected by fields larger than those found under transmission lines. Because of the known potential for interference with pacemakers by 60-Hz fields, field limits for pacemaker wearers have been established by the ACGIH. They recommend that, lacking additional information about their pacemaker, wearers of pacemakers and similar medical-assist devices limit their exposure to electric fields of 1 kV/m or less and to magnetic fields to 1 G (1,000 mG) or less (ACGIH, 2008). Additional discussion of interference with implanted devices is given in the accompanying technical report on health effects (Exponent, 2009).

There are currently no national standards in the United States for 60-Hz electric and magnetic fields. The state of Washington does not have guidelines for electric or magnetic fields from transmission lines. However, several states have been active in establishing mandatory or suggested limits on 60-Hz electric and (in two cases) magnetic fields. Six states have specific electric-field limits that apply to transmission lines: Florida, Minnesota, Montana, New Jersey, New York, and Oregon. Florida and New York have established regulations for magnetic fields. These regulations are summarized in Table 6.

Government agencies and utilities operating transmission systems have established design criteria that include EMF levels. BPA has maximum allowable electric fields of 9 and 5 kV/m on and at the edge of the right-of-way, respectively (USDOE, 1996). BPA also has maximum-allowable electric field strengths of 5 kV/m, 3.5 kV/m, and 2.5 kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively. The latter levels are based on limiting the maximum short-circuit currents from anticipated vehicles to less than 1 mA in shopping center lots and to less than 2 mA in commercial parking lots.

The electric fields from the proposed 500-kV line would meet the ACGIH standards, provided wearers of pacemakers and similar medical-assist devices are discouraged from unshielded right-of-way use. (A passenger in an automobile under the line would be shielded from the electric field.) The electric fields in limited areas on the right-of-way would exceed the ICNIRP guideline for public exposure, but would be below IEEE guideline limits. The magnetic fields from the proposed line would be below the ACGIH, ICNIRP, and IEEE limits.

The estimated peak electric fields on the right-of-way of the proposed transmission line would meet limits set in Florida, New York and Oregon, but not those of Minnesota and Montana (see Table 6). The BPA maximum allowable electric field limit would be met for all configurations of the proposed line. The edge of right-of-way electric fields from the proposed line would be below limits set in Florida and New Jersey, but above those in Montana and New York.

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The magnetic field at the edge of the right-of-way from the proposed line would be below the regulatory levels of states where such regulations exist.

7.0 Audible Noise

7.1 Basic Concepts

Audible noise (AN), as defined here, represents an unwanted sound, as from a transmission line, transformer, airport, or vehicle traffic. Sound is a pressure wave caused by a sound source vibrating or displacing air. The ear converts the pressure fluctuations into auditory sensations. AN from a source is superimposed on the background or ambient noise that is present before the source is introduced.

The amplitude of a sound wave is the incremental pressure resulting from sound above atmospheric pressure. The sound-pressure level is the fundamental measure of AN; it is generally measured on a logarithmic scale with respect to a reference pressure. The sound-pressure level (SPL) in decibels (dB) is given by:

$$\text{SPL} = 20 \log (P/P_0)\text{dB}$$

where P is the effective rms (root-mean-square) sound pressure, P_0 is the reference pressure, and the logarithm (log) is to the base 10. The reference pressure for measurements concerned with hearing is usually taken as 20 micropascals (Pa), which is the approximate threshold of hearing for the human ear. A logarithmic scale is used to encompass the wide range of sound levels present in the environment. The range of human hearing is from 0 dB up to about 140 dB, a ratio of 10 million in pressure (EPA, 1978).

Logarithmic scales, such as the decibel scale, are not directly additive: to combine decibel levels, the dB values must be converted back to their respective equivalent pressure values, the total rms pressure level found, and the dB value of the total recalculated. For example, adding two sounds of equal level on the dB scale results in a 3 dB increase in sound level. Such an increase in sound pressure level of 3 dB, which corresponds to a doubling of the energy in the sound wave, is barely discernible by the human ear. It requires an increase of about 10 dB in SPL to produce a subjective doubling of sound level for humans. The upper range of hearing for humans (140 dB) corresponds to a sharply painful response (EPA, 1978).

Humans respond to sounds in the frequency range of 16 to 20,000 Hz. The human response depends on frequency, with the most sensitive range roughly between 2000 and 4000 Hz. The frequency-dependent sensitivity is reflected in various weighting scales for measuring audible noise. The A-weighted scale weights the various frequency components of a noise in approximately the same way that the human ear responds. This scale is generally used to measure and describe levels of environmental sounds such as those from vehicles or occupational sources. The A-weighted scale is also used to characterize transmission-line noise. Sound levels measured on the A-scale are expressed in units of dB(A) or dBA.

AN levels and, in particular, corona-generated audible noise (see below) vary in time. In order to account for fluctuating sound levels, statistical descriptors have been developed for environmental noise. Exceedence levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of the time. Thus, the L_5 level refers to the noise level that is exceeded only 5 percent of the time. L_{50} refers to the sound level exceeded 50 percent of the time. Sound-level measurements and predictions for transmission lines are often expressed in terms of exceedence levels, with the L_5 level representing the maximum level and the L_{50} level representing a median level.

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Table 7 shows AN levels from various common sources. Clearly, there is wide variation. Noise exposure depends on how much time an individual spends in different locations. Outdoor noise generally does not contribute to indoor levels (EPA, 1974). Activities in a building or residence generally dominate interior AN levels.

BPA has established a transmission-line design criterion for corona-generated audible noise (L_{50} , foul weather) of 50 dBA at the edge of the right-of-way (USDOE, 2006). This criterion applies to new line construction and is under typical conditions of foul weather, altitude, and system voltage for the line. It is generally only of concern for 500-kV lines. This criterion has been interpreted by the state and BPA to meet Oregon Noise Control Regulations (Perry, 1982).

The Washington Administrative Code provides noise limitations by class of property, residential, commercial or industrial (Washington State, 1975). Transmission lines are classified as industrial and may cause a maximum permissible noise level of 60 dBA to intrude into residential property. During nighttime hours (10:00 pm to 7:00 am), the maximum permissible limit for noise from industrial to residential areas is reduced to 50 dBA. This latter level applies to transmission lines that operate continuously. The state of Washington Department of Ecology accepts the 50 dBA level at the edge of the right-of-way for transmission lines, but encouraged BPA to design lines with lower audible noise levels (WDOE, 1981).

Audible noise from substations is generated predominantly by equipment such as transformers, reactors and other wire-wound equipment. It is characterized by a 120 Hz hum that is associated with magnetic-field caused vibrations in the equipment. Noise from such equipment varies by voltage and other operating conditions. The BPA design level for substation noise is 50 dBA at the substation property line for new construction (USDOE, 2006). The design level is met by obtaining equipment that meets specified noise limits and, for new substations, by securing a no-built buffer beyond the substation perimeter fence.

In industrial, business, commercial, or mixed use zones the AN level from substations may exceed 50 dBA but must still meet any state or local AN requirements. The design criteria also allows the 50 dBA design level to be exceeded in remote areas where development of noise sensitive properties is highly unlikely.

The EPA has established a guideline of 55 dBA for the annual average day-night level (L_{dn}) in outdoor areas [EPA, 1978]. In computing this value, a 10 dB correction (penalty) is added to night-time noise between the hours of 10 p.m. and 7 a.m.

7.2 Transmission-line Audible Noise

Corona is the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that, under certain conditions, is accompanied by a 120-Hz hum. Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345 kV and higher during foul weather. The proposed 500-kV line will produce some noise under foul weather conditions.

The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, protrusions on the conductor surface—particularly water droplets on or dripping off the conductors—cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor)

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phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Based on hourly meteorologic records over several years from Kennewick, WA and Moro, OR, such conditions are expected to occur about 1 percent of the time during the year in the vicinity of the proposed line.

For a few months after line construction, residual grease or oil on the conductors can cause water to bead up on the surface. This results in more corona sources and slightly higher levels of audible noise and electromagnetic interference if the line is energized. However, the new conductors "age" in a few months, and the level of corona activity decreases to the predicted equilibrium value. During fair weather, insects and dust on the conductor can also serve as sources of corona.

All except Configuration 7 would use three 1.30-inch diameter conductors per phase to yield acceptable corona levels. However, Configuration 7 with split-phase 500-kV circuits on either side of the double circuit tower would employ three 1.60-inch diameter conductors per phase to achieve the required 50 dBA or less at the edge of the right-of-way.

7.3 Predicted Audible Noise Levels

Audible noise levels are calculated for average voltage of 536 kV and average conductor heights for fair- and foul-weather conditions. The predicted levels of corona-generated audible noise at the edge of the right-of-way for the proposed line configurations are given in Table 8. The L_{50} foul-weather levels for the proposed configurations range from 40 to 49 dBA. The highest levels would generally occur when the new 500-kV circuit is at the minimum distance of 75 feet from the edge of the right-of-way. This occurs for Configurations 1, 4, 6, 7, and 10. Predicted profiles of the L_{50} foul-weather levels for Configurations 1 and 7 are shown in Figure 37.

The audible noise levels for the No-action alternative are generally lower than the levels at the same locations with the proposed configurations. For the No-action alternative, the levels at the edges of existing rights-of-way range from ambient to 48 dBA. In this case, the existing McNary – Ross 345-kV and parallel Harvalum - Big Eddy 230-kV lines produce the highest noise levels.

During fair-weather conditions, which occur about 99 percent of the time, audible noise levels at the edge of the right-of-way would be about 20 dBA lower (if corona were present). These lower levels could be masked by ambient noise on and off the right-of-way.

7.4 Discussion

Along much of the proposed routes there would be increases in the perceived noise above ambient levels during foul weather at the edges of the right-of-way. This would be especially true in areas where the centerline of the proposed 500-kV line is at 75 feet from the edge of the right-of-way. However, even there, the corona-generated noise during foul weather would be masked to some extent by naturally occurring sounds such as wind and rain on foliage. The calculated foul-weather corona noise levels for the proposed line would be comparable to, or less, than those from existing 500-kV lines in Oregon and Washington. Relatively lower levels would be especially prevalent in line segments with existing wide rights-of-way where the proposed 500-kV line would be placed well away from the edge of the right-of-way.

Off the right-of-way corona-generated noise during fair weather will likely be masked or so low as to not be perceived even in fair weather. During foul-weather ambient noise levels can be high due to rain hitting foliage or buildings and wind. These sounds can mask corona noise both on and off the right-of-way. Furthermore people tend to be inside with windows closed, providing additional attenuation when corona noise is present.

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Off the right-of-way, the foul-weather levels of audible noise from the proposed line would be well below the 55 dBA level that can produce interference with speech outdoors. Residential buildings provide significant sound attenuation (-12 dBA with windows open; -24 dBA with windows closed). Therefore indoor noise levels off the right-of-way would be well below the 45 dBA level where interference with speech indoors can occur and below the 35 dBA level where sleep interference can occur (EPA, 1973; EPA, 1978).

The highest noise level of 49-dBA for the configurations would meet the BPA design criterion and, hence, the statutory limits established in both Oregon and Washington. The computed annual L_{dn} level for transmission lines operating in areas with 1 to 2 percent foul weather is about $L_{dn} = L_{50} - 6$ dB (Bracken, 1987). Therefore, assuming such conditions in the Big Eddy Transmission Line Project area, the estimated worst case L_{dn} at the edge of the right-of-way would be approximately 43 dBA, which is below the EPA L_{dn} guideline of 55 dBA.

No transformers will be installed at the new Knight Substation so that the audible noise at the edge of the substation will be due to the transmission lines entering the substation. Since the proposed transmission line will meet the 50 dBA criterion at the edge of the right-of-way, this criterion as it applies to substations will also be met (USDOE, 2006).

At the existing Big Eddy substation audible noise levels will also be predominantly due to foul weather corona noise from incoming and outgoing transmission lines. Noise levels produced from the new transformers will be lower than that from the existing equipment and unnoticeable when added to the existing noise levels at the edge of the substation property.

Thus all applicable federal, state, and local regulations will be met by the proposed transmission line and substation addition and modification.

8.0 Electromagnetic Interference

8.1 Basic Concepts

Corona on transmission-line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. The noise can cause radio and television interference (RI and TVI). In certain circumstances, corona-generated electromagnetic interference (EMI) can also affect communications systems and other sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345 kV or higher. This is especially true of interference with television signals. The bundle of three 1.3-inch (or 1.6-inch) diameter conductors used in the design of the proposed 500-kV line will mitigate corona generation and thus keep radio and television interference levels at acceptable levels.

Spark gaps on distribution lines and on low-voltage wood-pole transmission lines are a more common source of RI/TVI than is corona from high-voltage electrical systems. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires. The proposed transmission line would be constructed with modern hardware that eliminates such problems and therefore minimizes gap noise. Consequently, this source of EMI is not anticipated for the proposed line.

No state has limits for either RI or TVI. In the United States, electromagnetic interference from power transmission systems is governed by the Federal Communications Commission (FCC) Rules and Regulations presently in existence (Federal Communications Commission, 1988). A power transmission

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system falls into the FCC category of "incidental radiation device," which is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." For purposes of these regulations, harmful interference is defined as: "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (Federal Communications Commission, 1988: Vol II, part 15. 47CFR, Ch. 1).

Electric power companies have been able to work quite well under the present FCC rule because harmful interference can generally be eliminated. It has been estimated that more than 95 percent of power-line sources that caused interference were due to gap-type discharges. These can be found and completely eliminated, when required to prevent interference (USDOE, 1980). Complaints related to corona-generated interference occur infrequently. This is especially true due to increased use of FM radio, cable television and satellite television, which are not subject to corona-generated interference. Mitigation of corona-generated interference with conventional broadcast radio and television receivers can be accomplished in several ways, such as use of a directional antenna or relocation of an existing antenna (USDOE, 1977; USDOE, 1980; Loftness et al., 1981).

8.2 Radio Interference (RI)

Radio reception in the AM broadcast band (535 to 1605 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near to transmission lines can be affected by RI. The IEEE Radio Noise Design Guide identifies an acceptable limit of fair-weather RI as expressed in decibels above 1 microvolt per meter ($\text{dB}\mu\text{V}/\text{m}$) of about $40 \text{ dB}(\mu\text{V}/\text{m})$ at 1 megahertz (MHz) (IEEE Committee Report, 1971). This limit applies at 100 ft. (30 m) from the outside conductor. As a general rule, average levels during foul weather (when the conductors are wet) are 16 to 22 $\text{dB}\mu\text{V}/\text{m}$ higher than average fair-weather levels.

8.3 Predicted RI Levels

The L_{50} fair-weather RI levels were predicted for all configurations at the furthest of 100 ft. (30 m) from the outside conductor or the edge of the right-of-way. The results are shown in Table 9. The L_{50} levels for all configurations are at or below the acceptable limit of about $40 \text{ dB}\mu\text{V}/\text{m}$ and are therefore compliant with the IEEE guideline level. The RI levels for the proposed 500-kV configurations would exceed those from the existing lower voltage lines.

8.4 Television Interference (TVI)

Corona-caused TVI occurs during foul weather and is generally of concern for transmission lines with voltages of 345 kV or above, and only for conventional receivers within about 600 ft. (183 m) of a line. As is the case for RI, gap sources on distribution and low-voltage transmission lines are the principal observed sources of TVI. The use of modern hardware and construction practices for the proposed line would minimize such sources.

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8.5 Predicted TVI Levels

The predicted foul-weather TVI levels at 75MHz from the proposed configurations operating at 536 kV are shown in Table 9. These levels are given for the further of 100 ft. (30 m) from the outside conductor or the edge of the right-of-way. The levels at these points range from 2 to 24 dB μ V/m depending primarily on the distance from of the proposed 500-kV line. These levels are comparable to or lower than those from existing 500-kV lines in Oregon and Washington. As with RI the largest values occur when the proposed 500-kV line is directly adjacent to the edge of the right-of-way.

At the highest predicted levels, there is a potential for interference with television signals at locations very near the proposed line in fringe reception areas. However, several factors reduce the likelihood of occurrence. Corona-generated TVI occurs only in foul weather; consequently, signals will not be interfered with most of the time, which is characterized by fair weather. Because television antennas are directional, the impact of TVI is related to the location and orientation of the antenna relative to the transmission line. If the antenna were pointed away from the line, then TVI from the line would affect reception much less than if the antenna were pointed towards the line. Since the level of TVI falls off with distance, the potential for interference becomes minimal at distances greater than several hundred feet from the centerline.

Other forms of TVI from transmission lines are signal reflection (ghosting) and signal blocking caused by the relative locations of the transmission structure and the receiving antenna with respect to the incoming television signal. Again only houses within several hundred feet of the proposed line would possibly be affected.

Television systems that operate at higher frequencies, such as satellite receivers, are not affected by corona-generated TVI. Cable television systems are also not affected.

Interference with television reception can be corrected by any of several approaches: improving the receiving antenna system; installing a remote antenna; installing an antenna for TV stations less vulnerable to interference; connecting to an existing cable system; or installing a translator (cf. USDOE, 1977). BPA has an active program to identify, investigate, and mitigate legitimate RI and TVI complaints. It is anticipated that any instances of TVI caused by the proposed line could be effectively mitigated.

8.6 Interference with Other Devices

Corona-generated interference can conceivably cause disruption on other communications bands such as the citizen's (CB) and mobile bands. However, mobile-radio communications are not susceptible to transmission-line interference because they are generally frequency modulated (FM). Similarly, cellular telephones operate at a frequency of about 900 MHz or higher, which is above the frequency where corona-generated interference is prevalent. In the unlikely event that interference occurs with these or other communications, mitigation can be achieved with the same techniques used for television and AM radio interference.

8.7 Conclusion

Predicted EMI levels for the proposed 500-kV transmission line are comparable to, or lower, than those that already exist near 500-kV lines and no impacts of corona-generated interference on radio, television, or other reception are anticipated. Based on land use surveys approximately 10 to 12 houses could be within 500 feet of the proposed line (Table 5) and possibly affected by interference. Whether interference

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occurs will depend on which 28-mile route alternative and line designs are selected as well as the type of television or radio receiver. Furthermore, if interference should occur, there are various methods for correcting it; BPA has a program to respond to legitimate complaints.

9.0 Other Corona Effects

Corona is visible as a bluish glow or as bluish plumes. On the proposed 500-kV line, corona levels would be very low, so that corona on the conductors would be observable only under the darkest conditions and only with the aid of binoculars, if at all. Without a period of adaptation for the eyes and without intentional looking for the corona, it would probably not be noticeable.

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. Ozone is approximately 90 percent of the oxidants, while the remaining 10 percent is composed principally of nitrogen oxides. The national primary ambient air quality standard for photochemical oxidants, of which ozone is the principal component, is 235 micrograms/cubic meter) or 120 parts per billion. The maximum incremental ozone levels at ground level produced by corona activity on the proposed transmission line during foul weather would be much less than 1 part per billion. This level is insignificant when compared with natural levels and fluctuations in natural levels.

10.0 Summary

The number of nearby houses/businesses that could be impacted by field or corona effects is small and fairly consistent among the three line route alternatives: ranging from 2 to 5 within 300 feet of centerline and from 10 to 12 within 500 feet.

Electric and magnetic fields from the proposed transmission line have been characterized using well-known techniques accepted within the scientific and engineering community. The expected electric-field levels from the proposed line at minimum design clearance would be comparable to those from existing 500-kV lines in Washington and elsewhere. The expected magnetic-field levels from the proposed line would be comparable to, or less than, those from other 500-kV lines in Washington, Oregon and elsewhere.

The peak electric field expected under the proposed line would be 8.8 kV/m; the maximum value at the edge of the right-of-way would be about 2.4 kV/m. Clearances at road crossings would be increased to reduce the peak electric-field value to 5 kV/m or less.

Under maximum current conditions, the maximum magnetic fields on and at the edge of the right-of-way vary considerably among configurations: ranging from 219 to 60 mG on the right-of-way and from 82 to less than 1 mG at the edge of the right-of-way. Average values of the fields are much reduced and also vary widely between configurations. The average field value at the edge of the right-of-way adjacent to the proposed line ranges from 21 to less than 1 mG depending on right-of-way width and the presence of other lines.

For the No-action alternative, maximum magnetic fields would range from 163 to 0 mG on the right-of-way and from 67 to 0 mG at the edge. For this alternative average fields would be reduced to a maximum of 48 on the right-of-way and 23 at the edge.

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The electric fields from the proposed line would meet regulatory limits for public exposure in some states and guidelines set established by IEEE. However, the electric fields from the line could exceed the regulatory limits or guidelines for peak fields established in some states and by ICNIRP. The magnetic fields from the proposed line would be within the regulatory limits of the two states that have established such limits and below the guidelines for public exposure established by ICNIRP and IEEE. Washington does not have any electric- or magnetic-field regulatory limits or guidelines.

Short-term effects from transmission-line fields are well understood and can be mitigated. Nuisance shocks arising from electric-field induced currents and voltages could be perceivable on the right-of-way of the proposed line. It is common practice to ground permanent conducting objects during and after construction to mitigate against such occurrences.

Corona-generated audible noise from the line would be perceivable during foul weather. The levels would be comparable to or less those near existing 500-kV transmission lines in Oregon and Washington, would be in compliance with noise regulations in Oregon and Washington, and would be below levels specified in EPA guidelines.

Corona-generated electromagnetic interference from the proposed line would be comparable to or less than that from existing 500-kV lines in Washington. Radio interference levels would be at or below limits identified as acceptable. Television interference, a foul-weather phenomenon, is anticipated to be comparable to or less than that from existing 500-kV lines in Washington. The presence of only 10 to 12 residences/businesses closer than 500 feet (183 m) to the line and the rarity of precipitation conditions when TVI occurs (about 1% of time) make it unlikely that television reception will be affected. However, if legitimate complaints arise, BPA has a mitigation program.

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Table 1: Description of line configurations and associated segments along the proposed Big-Eddy– Knight 500-kV transmission line alternative routes.

Configuration		Line segments ²	Segment length, miles	Total configuration length by alternative, miles		
No.	Description ¹			West	Middle	East
1	BE-KN SglCkt	W-1 thru W-3	3.9	9.6	14.0	14.4
		W-5	0.8			
		W-8	4.9			
		M-3	1.9			
		M-5	7.6			
		M-7	4.9			
		E-4	14.0			
2	BE-KN SglCkt & HARV-BE	M-1 and M-2	9.2	-	9.2	9.2
		E-1 and E-2	9.2			
3	BE-KN SglCkt & McN-RO & HARV-BE	E-3	4.8	-	-	4.8
4	BE-KN SglCkt & CHE-GOL	W-6 and W-7	16.4	16.4	2.1	-
		M-6	2.1			
5	BE-KN SglCkt & Spearfish Tap	W-4	1.1	1.1	-	-
6	BE-KN SglCkt & BE-SPR	M-4	1.3	-	1.3	-
7	BE-KN DbICkt split-phase w/ 3x1.6" bundles	W-1 thru W-3	3.9	3.9	-	-
7A	BE-KN DbICkt tower with SglCkt w/ 3x1.3" bundles on one side	W-1 thru W-3	3.9	3.9	-	-
8	BE-KN DbICkt w/ HARV-BE	M-1 and M-2	9.2	-	9.2	9.2
		E-1 and E-2	9.2			
9	BE-KN DbICkt w/ McN-RO & HARV-BE	E-3	4.8	-	-	4.8
10	BE-KN DbICkt w/ CHE-GOL	W-6 and W-7	16.4	16.4	2.1	-
		M-6	2.1			
11	BE-KN DbICkt w/ Spearfish Tap	W-4	1.1	1.1	-	-
12	BE-KN DbICkt split phase & Spearfish Tap	W-4	1.1	1.1	-	-

Notes for Table 1:

- 1 BE-KN = Big Eddy-Knight; HARV-BE = Harvalum-Big Eddy; McN-RO = McNary-Ross; CHE-GOL = Chenoweth-Goldendale; BE-SPR = Big Eddy Spring Creek; SglCkt = Single circuit; DbICkt = Double circuit; || = parallel to.
- 2 Physical locations of alternative routes and segments are shown in Figure 1. Segments are numbered from Big Eddy to Knight by route: W = West alternative, M = Middle alternative; E = East alternative

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Table 2: Physical and electrical characteristics of transmission lines in the Big Eddy – Knight 500-kV Transmission Line Project corridor.

Line Characteristics	Proposed Line		Existing Lines				
	Big Eddy – Knight 500-kV ²		Harvalum-Big Eddy 230-kV	McNary-Ross 345-kV	Chenoweth-Goldendale 115-kV ⁵	Spearfish Tap 115-kV	Big Eddy-Spring Creek 230 kV
Voltage, kV Maximum/Average ¹	550/536		241.5/232	362/350	0/0	121/118	241.5/237
Circuit Configuration ²	Single	Double	Single	Single	Single	Single	Single
Proposed Current, A Peak/Average	970/485	485/243	1075/505	630/380	0/0	35/9	872/244
No-action Current, A Peak/Average	-	-	820/410	520/244	0/0	35/9	950/266
Electric Phasing (looking towards Knight)	B A C	A C B B C A	C B A	C A B	B C A	C B A	B A C
Clearance, ft. Minimum/Average ^{1,3}	35/47	36/47	32.5/45.4	33.8/47.6	25.9/34.4	25.9/29.5	33.8/46.7
Tower configuration	Delta	DC-Vert	Flat	Flat	Flat	Flat	Flat
Phase spacing, ft.	46H, 31.5V	36.5, 56.5H 36V	27	32	12	12	27
Conductor: #/Diameter, in.	3/1.3	3/1.3 or 3x1.6 ²	1/1.382	1/1.602	1/0.563	1/0.642	1/1.382
Centerline distance to edge of ROW, ft. ⁴	75	75	187.5/62.5	312.5/187.5	50	425/50	62.5
Centerline distance to proposed line, ft.	-	-	125	125	125	125	125
Average altitude, ft.	1500	1500	600	600	1600	350	1650

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Notes for Table 2:

- 1 Average voltage and average clearance used for corona calculations.
- 2 When the proposed Big Eddy – Knight 500-kV line is energized on all six 3x1.6” phase bundles on a double circuit tower (Configuration 7), the three phases of the line will be split between six conductor bundles with each carrying one half of the single-circuit current. When the proposed Big Eddy – Knight 500-kV line is energized with only three 3x1.3” phase bundles on the double circuit tower (Configuration 7A), the non-energized phases will be left ungrounded. In Configuration 7A the energized circuit of the proposed line could be on either the west or east side of the tower. When the proposed Big-Eddy – Knight 500-kV line is on a double circuit tower with one of the existing parallel lines, the respective circuits will have the same voltages and currents as the individual single-circuit lines. When the existing Harvalum - Big Eddy or McNary – Ross line is the parallel line, they will have a 3x1.3” bundle (Configurations 8 and 9). The Chenoweth – Goldendale and Spearfish Tap lines would have a single 1.3” conductor when placed on the double circuit tower (Configurations 10 and 11).
- 3 To meet the BPA 9 kV/m limit for peak electric field and use consistent design clearances, the minimum clearance for all proposed double-circuit tower configurations was increased to 36 feet.
- 4 The distance to the west and east) edges of the right-of-way depends on the configuration as shown in Figures 2 – 10.
- 5 The Chenoweth – Goldendale 115-kV line is normally open at both ends with no current.

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Table 3: Calculated maximum and average electric fields for the proposed Big Eddy – Knight 500-kV line operated at maximum voltage by configuration. Configurations are described in Tables 1 and 2. [Note: all 1.3” bundles except Config. 7]

No.	Configuration Location Field Description	Electric Field, kV/m Proposed Alternative				Electric Field, kV/m No-action Alternative			
		Peak on ROW		At Edge of ROW ²		Peak on ROW		At Edge of ROW ²	
		Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average
1	BE-KN SglCkt	8.6	5.4	2.4, 2.4	2.3, 2.3	-	-	-	-
2	BE-KN SglCkt & HARV-BE	8.6	5.4	2.4, 1.5	2.4, 1.2	2.9	1.7	0.1, 1.3	0.1, 1.1
3	BE-KN SglCkt & McN-RO & HARV-BE ³ Use CAB phasing	8.8	5.8	0.2, 1.3	0.2, 1.1	4.5	2.6	<0.1, 1.3	<0.1, 1.1
4	BE-KN SglCkt & CHE-GOL	8.6	5.4	2.4, 0.3	2.3, 0.3	0.0	0.0	0.0	0.0
5	BE-KN SglCkt & Spearfish Tap	8.6	5.4	0.1, 0.2	0.1, 0.2	1.2	1.0	0.1, 0.4	0.2, 0.4
6	BE-KN SglCkt & BE-SPR	8.6	5.4	2.4, 1.4	2.3, 1.2	2.7	1.6	1.3, 1.3	1.1, 1.1
7	BE-KN DblCkt w/ 3x1.6” bundles ³	7.3	4.3	1.3, 1.3	1.3, 1.3	-	-	-	-
7A	BE-KN DblCkt w/ only 1 circuit ³	8.8	5.8	1.3, 0.1	1.4, 0.3	-	-	-	-
8	BE-KN DblCkt w/ HARV-BE ³	7.9	4.9	0.3, 0.5	0.2, 0.4	2.9	1.7	1.3, 0.1	1.1, 0.1
9	BE-KN DblCkt w/ McN-RO & HARV-BE ³	7.6	4.6	0.1, 1.3	0.1, 1.1	4.5	2.6	<0.1, 1.3	<0.1, 1.1
10	BE-KN DblCkt w/ CHE-GOL ³	8.7	5.7	1.3, 0.1	1.4, 0.2	0.0	0.0	0.0	0.0
11	BE-KN DblCkt w/ Spearfish Tap ³	8.5	5.6	0.1, 0.2	0.1, <0.1	1.2	1.0	0.0, 0.4	0.2, 0.4
12	BE-KN DblCkt & Spearfish Tap ³	7.0	4.2	0.1, 0.3	0.1, 0.3	1.2	1.0	0.0, 0.4	0.2, 0.4

Notes for Table 3:

- 1 BE-KN = Big Eddy-Knight; HARV-BE = Harvalum- Big Eddy; McN-RO = McNary-Ross; CHE-GOL = Chenoweth-Goldendale; BE-SPR = Big Eddy Spring Creek; SngCkt = Single circuit; DblCkt = Double circuit
- 2 Field at west (north) edge of ROW shown first.
- 3 To meet the BPA 9 kV/m limit for peak electric field and use consistent design clearances, the minimum clearance for all proposed double-circuit tower configurations was increased to 36 feet.

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Table 4: Calculated maximum and average magnetic fields for the proposed Big Eddy – Knight 500-kV line operated at maximum current/minimum clearance and average current/average clearance. Configurations are described in Tables 1 and 2.

Configuration ¹		Magnetic Field, mG Proposed Alternative				Magnetic Field, mG No-action Alternative			
No.	Location Field Description	Peak on ROW		At Edge of ROW ²		Peak on ROW		At Edge of ROW ²	
		Maximum	Average	Maximum	Average	Maximum	Average	Maximum	Average
1	BE-KN SglCkt	159	50	42, 42	18, 18	-	-	-	-
2	BE-KN SglCkt & HARV-BE	219	65	49, 82	21, 31	163	48	7, 60	3, 22
3	BE-KN SglCkt & McN-RO & HARV-BE	214	62	7, 78	3, 29	161	46	3, 61	2, 23
4	BE-KN SglCkt & CHE-GOL	159	50	42, 8	18, 4	0	0	0	0
5	BE-KN SglCkt & Spearfish Tap	160	50	3, 8	1, 4	7	2	0, 2	0, <1
6	BE-KN SglCkt & BE-SPR	155	49	43, 64	18, 14	176	31	67, 67	15, 15
7	BE-KN DblCkt w/ 3x1.6" bundles	60	17	14, 14	6, 6	-	-	-	-
7A	BE-KN DblCkt w/ only 3 bundles	118	38	52, 29	21, 13	-	-	-	-
8	BE-KN DblCkt w/ HARV-BE	128	35	3, 33	2, 12	163	48	7, 60	3, 22
9	BE-KN DblCkt w/ McN-RO & HARV-BE	212	61	3, 79	1, 29	161	46	3, 61	2, 23
10	BE-KN DblCkt w/ CHE-GOL 36'	117	38	52, 29	21, 13	0	0	0	0
11	BE-KN DblCkt w/ Spearfish Tap 36'	116	38	3, 27	1, 13	7	2	0, 2	0, <1
12	BE-KN DblCkt & Spearfish Tap	60	17	<1, 3	<1, 1	7	2	0, 2	0, <1

Notes for Table 4:

- 1 BE-KN = Big Eddy-Knight; HARV-BE = Harvalum- Big Eddy; McN-RO = McNary-Ross; CHE-GOL = Chenoweth-Goldendale; BE-SPR = Big Eddy Spring Creek; SngCkt = Single circuit; DblCkt = Double circuit
- 2 Field at west (north) edge of ROW shown first.
- 3 To meet the BPA 9 kV/m limit for peak electric field and use consistent design clearances, the minimum clearance for all proposed double-circuit tower configurations was increased to 36 feet.

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Table 5: Locations and ranges of average and maximum magnetic fields at residences and businesses near proposed line by primary circuit configuration and line route.

Primary Configuration	Single Circuit			Double Circuit+		
	East*	Middle*	West	East	Middle	West
Houses < 300 ft	3	2	4	5	4	4
Houses < 500 ft	12	11	10	10	10	10
Range of Distances from Centerline, ft	71 - 484	71 - 425	203 - 486	191 - 484	191 - 495	203 - 486
Range of Average Magnetic Field, mG	0.5 - 22.3	0.7 - 22.3	0.5 - 3.1	0.3 - 1.8	0.1 - 1.8	0.1 - 3.5
Range of Maximum Magnetic Field, mG	1.1 - 45	1.4 - 45	1.1 - 6.2	0.7 - 4.6	0.2 - 4.5	0.2 - 7

* A single house at 71 feet from the proposed centerline contributes the high field levels along the East and Middle alternatives.

+ Double circuit configuration counts include houses from single circuit sections E-4 and M-5, where no double circuit is planned.

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Table 6: Electric- and magnetic-field exposure guidelines.

ORGANIZATION	TYPE OF EXPOSURE	ELECTRIC FIELD, kV/m	MAGNETIC FIELD, mG
ACGIH	Occupational	25 ¹	10,000
ICNIRP	Occupational	8.3 ²	4,200
	General Public	4.2	833
IEEE	Occupational	20	27,100
	General Public	5 ³	9,040

- 1 Grounding is recommended above 5 –7 kV/m and conductive clothing is recommended above 15 kV/m.
- 2 Increased to 16.7 kV/m if nuisance shocks are eliminated.
- 3 Within power line rights-of-way, the guideline is 10 kV/m.

Sources: ACGIH, 2008; ICNIRP, 1998; ICES, 2002

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Table 7: States with transmission-line field limits.

STATE AGENCY	WITHIN RIGHT-OF- WAY	AT EDGE OF RIGHT-OF- WAY	COMMENTS
a. 60-Hz ELECTRIC-FIELD LIMIT, kV/m			
Florida Department of Environmental Regulation	8 (230 kV) 10 (500 kV)	2	Codified regulation, adopted after a public rulemaking hearing in 1989.
Minnesota Environmental Quality Board	8	–	12-kV/m limit on the high voltage direct current (HVDC) nominal electric field.
Montana Board of Natural Resources and Conservation	7 ¹	1 ²	Codified regulation, adopted after a public rulemaking hearing in 1984.
New Jersey Department of Environmental Protection	–	3	Used only as a guideline for evaluating complaints.
New York State Public Service Commission	11.8 (7,11) ³	1.6	Explicitly implemented in terms of a specified right-of-way width.
Oregon Facility Siting Council	9	–	Codified regulation, adopted after a public rulemaking hearing in 1980.
b. 60-Hz MAGNETIC-FIELD LIMIT, mG			
Florida Department of Environmental Regulation	–	150 (230 kV) 200 (500 kV)	Codified regulations, adopted after a public rulemaking hearing in 1989.
New York State Public Service Commission	–	200	Adopted August 29, 1990.

Notes for Table 6:

- 1 At road crossings
- 2 Landowner may waive limit
- 3 At highway and private road crossings, respectively

Source: USDOE, 1996

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Table 8: Common noise levels.

Sound Level, dBA	Noise Source or Effect
130	Threshold of pain
110	Rock-and-roll band
80	Truck at 50 ft. (15.2 m)
70	Gas lawnmower at 100 ft. (30 m)
60	Normal conversation indoors
50	Moderate rainfall on foliage
49	Highest foul-weather L ₅₀ at edge of proposed 500-kV right-of-way
40	Refrigerator
25	Bedroom at night
0	Hearing threshold

Adapted from: USDOE, 1985; USDOE, 1996.

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Table 9: Calculated median (L₅₀) foul-weather audible noise levels at the edge of the right-of-way for the proposed Big Eddy – Knight 500-kV line operated at average voltage. Configurations are described in Table 1.

Configuration		Foul weather L50 Audible Noise, dBA	
No.	Description ¹	Proposed Alternative ²	No-action Alternative ²
1	BE-KN SglCkt	49, 49	-
2	BE-KN SglCkt & HARV-BE	48, 45	30, 35
3	BE-KN SglCkt & McN-RO & HARV-BE	48, 49	45, 48
4	BE-KN SglCkt & CHE-GOL	49, 46	-
5	BE-KN SglCkt & Spearfish Tap	42, 45	13, 23
6	BE-KN SglCkt & BE-SPR	49, 46	37, 37
7	BE-KN DblCkt w/ 3x1.6” bundles	49, 49	-
7A	BE-KN DblCkt w/ only SglCkt on west side	48, 46	-
8	BE-KN DblCkt w/ HARV-BE	45, 47	30, 35
9	BE-KN DblCkt w/ McN-RO & HARV-BE	43, 44	45, 48
10	BE-KN DblCkt w/ CHE-GOL	49, 47	-
11	BE-KN DblCkt w/ Spearfish Tap	40, 46	13, 23
12	BE-KN DblCkt & Spearfish Tap	46, 48	13, 23

Notes for Table 8:

- 1 BE-KN = Big Eddy-Knight; HARV-BE = Harvalum-Big Eddy; McN-RO = McNary-Ross; CHE-GOL = Chenoweth-Goldendale; BE-SPR = Big Eddy Spring Creek; SglCkt = Single circuit; DblCkt = Double circuit
- 2 Field at west (north) edge of ROW shown first.

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Table 10 **Calculated median (L₅₀) fair-weather radio interference level and foul weather television level for the proposed Big Eddy – Knight 500-kV line operated at average voltage.** Configurations are described in Table 1.

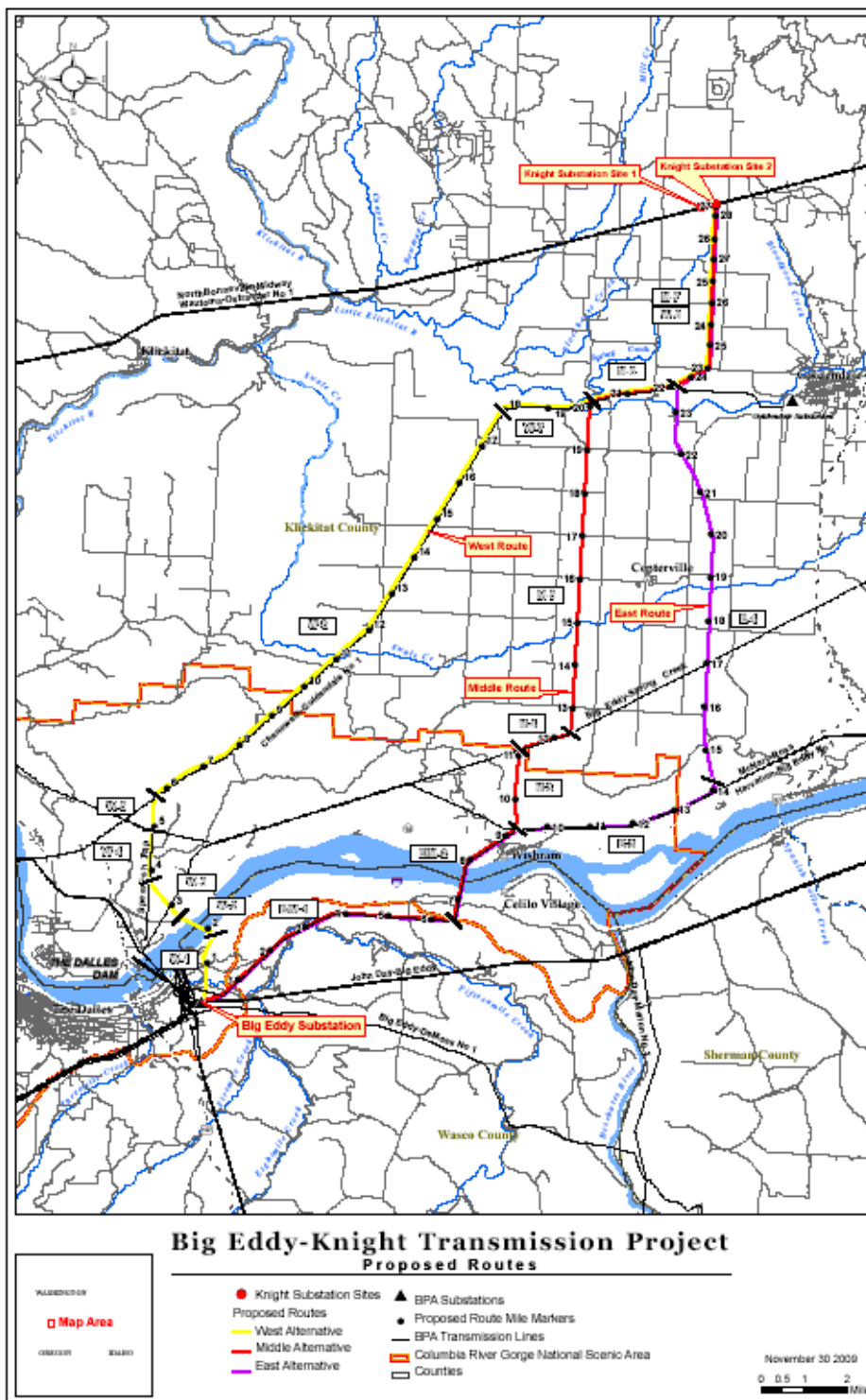
Configuration		L50 Fair-Weather RI Level at 1 MHz, dB(μV/m) ²	Foul-Weather TVI at 75 MHz, dB(μV/m) ²
No.	Description ¹		
1	BE-KN SglCkt	39, 39	24, 24
2	BE-KN SglCkt & HARV-BE	39, 31	23, 10
3	BE-KN SglCkt & McN-RO & HARV-BE	34, 31	16, 13
4	BE-KN SglCkt & CHE-GOL	39, 36	24, 17
5	BE-KN SglCkt & Spearfish Tap	29, 35	6, 16
6	BE-KN SglCkt & BE-SPR	39, 32	24, 11
7	BE-KN DblCkt w/ 3x1.6" bundles	38, 38	21, 21
7A	BE-KN DblCkt w/ only 3 bundles	41, 37	23, 18
8	BE-KN DblCkt w/ HARV-BE	37, 38	17, 18
9	BE-KN DblCkt w/ McN-RO & HARV-BE	33, 33	7, 8
10	BE-KN DblCkt w/ CHE-GOL	41, 37	23, 18
11	BE-KN DblCkt w/ Spearfish Tap	25, 36	2, 17
12	BE-KN DblCkt & Spearfish Tap	34, 36	8, 13

Notes for Table 9:

- 1 BE-KN = Big Eddy-Knight; HARV-BE = Harvalum- Big Eddy; McN-RO = McNary-Ross; CHE-GOL = Chenoweth-Goldendale; BE-SPR = Big Eddy Spring Creek; SglCkt = Single circuit; DblCkt = Double circuit
- 2 Field at west (north) side of ROW shown first. Calculated levels shown at 100 feet (30 m) from the outside conductor or at the edge of the right-of-way, whichever is further from the conductor.

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Figure 1: Alternative Routes and Segments for the Proposed Big Eddy – Knight 500-kV Transmission Line.

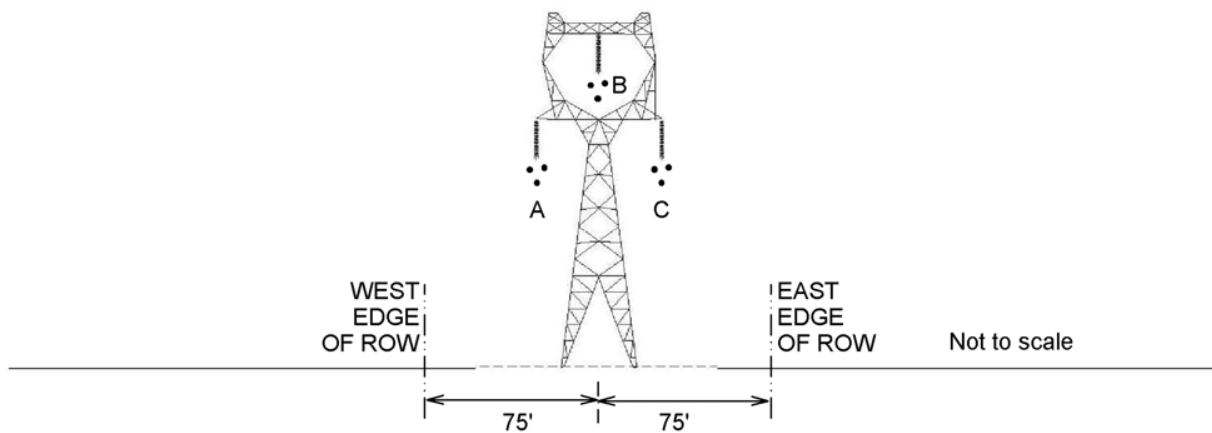


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Figure 2: Single-circuit Configuration 1 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 1

Big Eddy-Knight Proposed Single Circuit
Voltage: 536 kV (ave.), 550 kV (max.)
Current: 485 A (ave.), 970 A (max.)
Conductors: 3 x 1.3 in., 17 in. bundle spacing



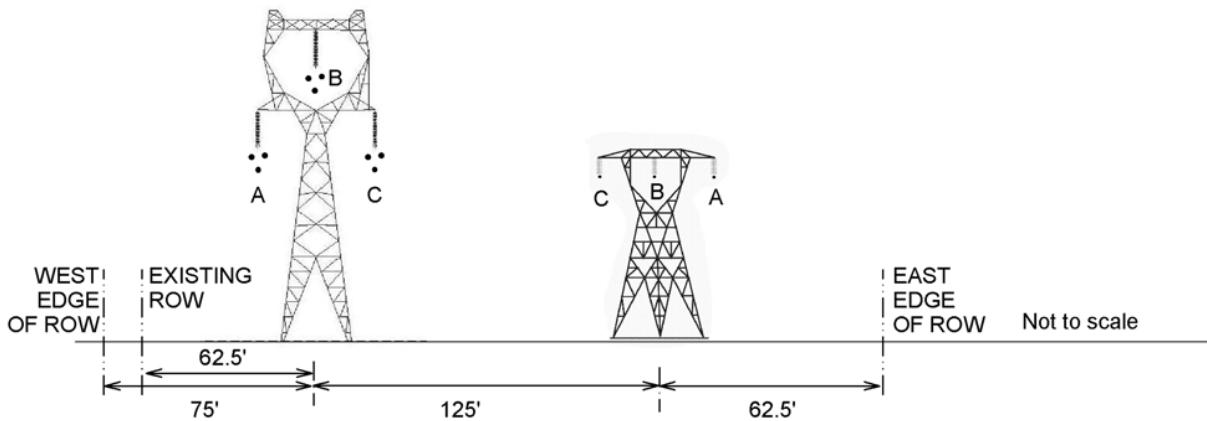
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Figure 3: Single-circuit Configuration 2 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 2

Big Eddy-Knight Proposed Single Circuit
 Voltage: 536 kV (ave.), 550 kV (max.)
 Current: 485 A (ave.), 970 A (max.)
 Conductors: 3 x 1.3 in., 17 in. bundle spacing

Harvalum-Big Eddy Single Circuit
 Voltage: 232 kV (ave.), 241.5 kV (max.)
 Current: 505 A (ave.), 1075 A (max.)
 Conductors: 1 x 1.382 in.



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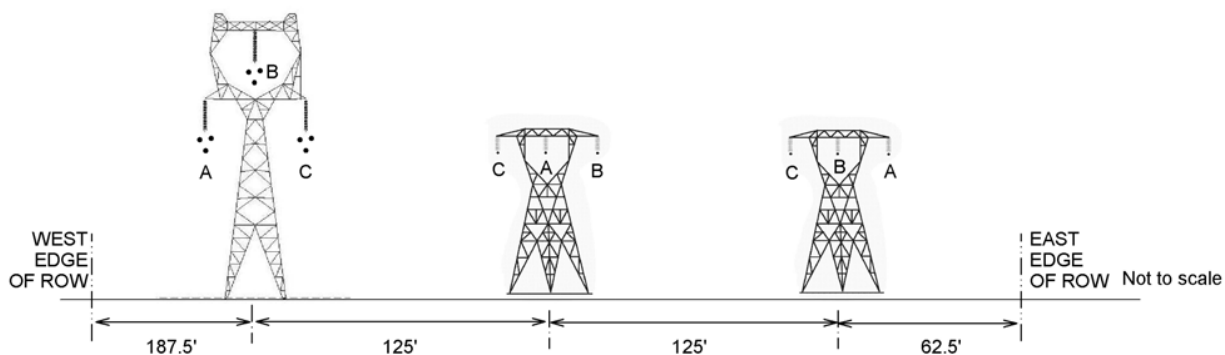
Figure 4: Single-circuit Configuration 3 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 3

Big Eddy-Knight Proposed Single Circuit
See Figure 2.

Harvalum-Big Eddy Single Circuit
See Figure 3.

McNary-Ross Single Circuit
Voltage: 350 kV (ave.), 362 kV (max.)
Current: 380 A (ave.), 630 A (max.)
Conductors: 1 x 1.602 in.



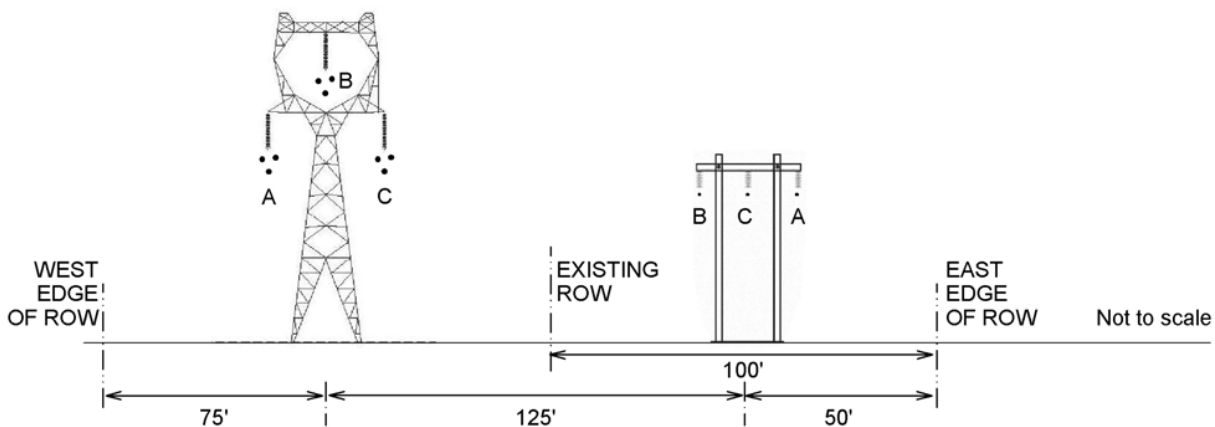
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Figure 5: Single-circuit Configuration 4 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 4

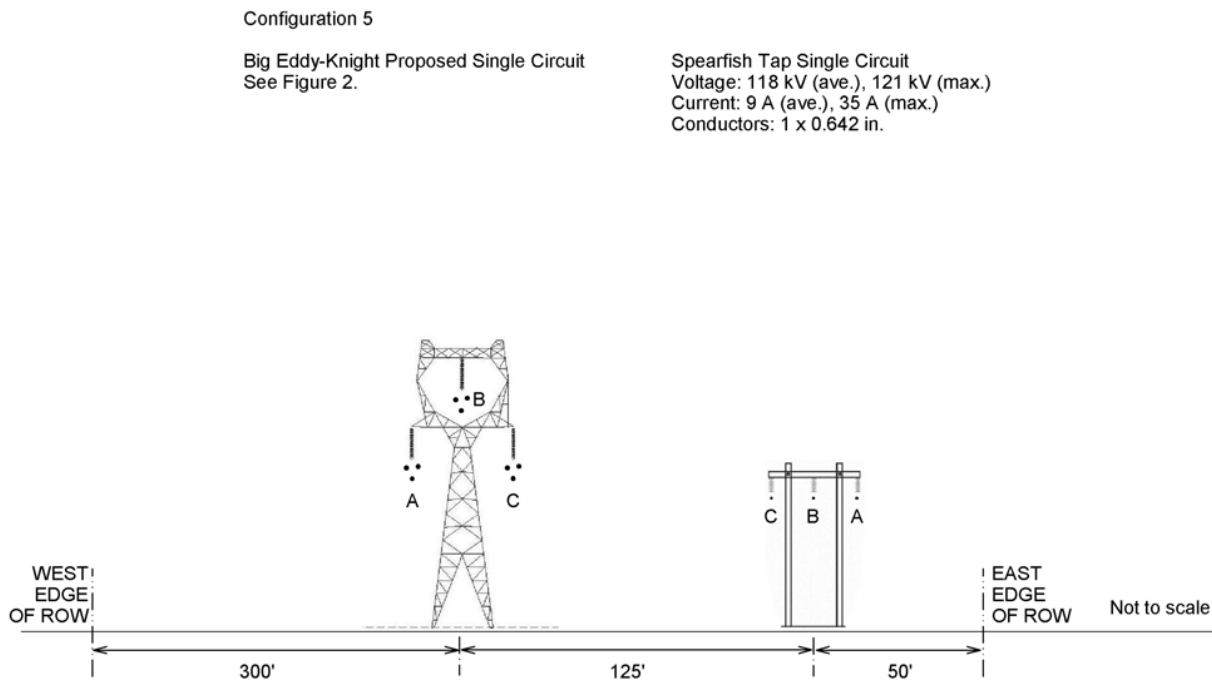
Big Eddy-Knight Proposed Single Circuit
See Figure 2.

Chenoweth-Goldendale Single Circuit
Voltage: 0 kV
Current: 0 A
Conductors: 1 x 0.563 in.



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Figure 6: Single-circuit Configuration 5 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.



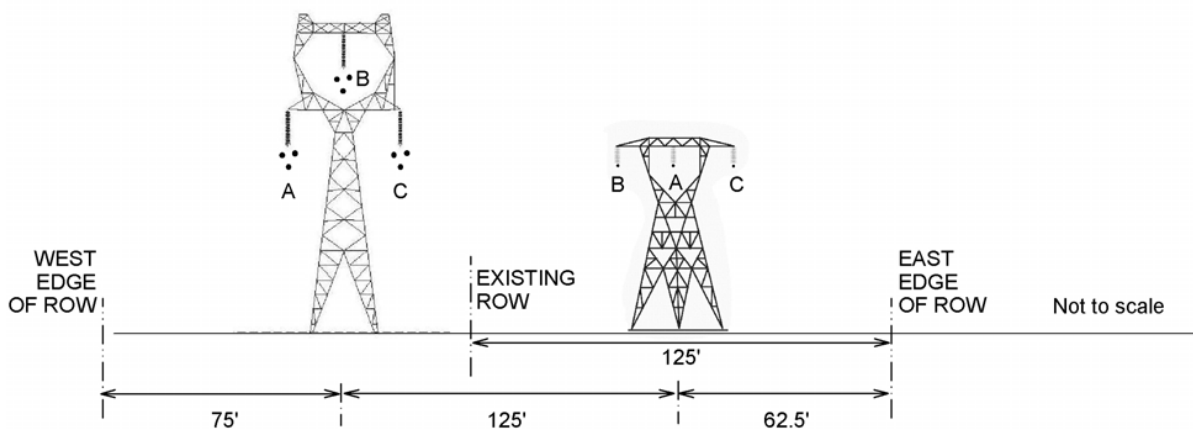
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Figure 7: Single-circuit Configuration 6 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 6

Big Eddy-Knight Proposed Single Circuit
See Figure 2.

Big Eddy-Spring Creek Single Circuit
Voltage: 237 kV (ave.), 241.5 kV (max.)
Current: 244 A (ave.), 872 A (max.)
Conductors: 1 x 1.382 in.

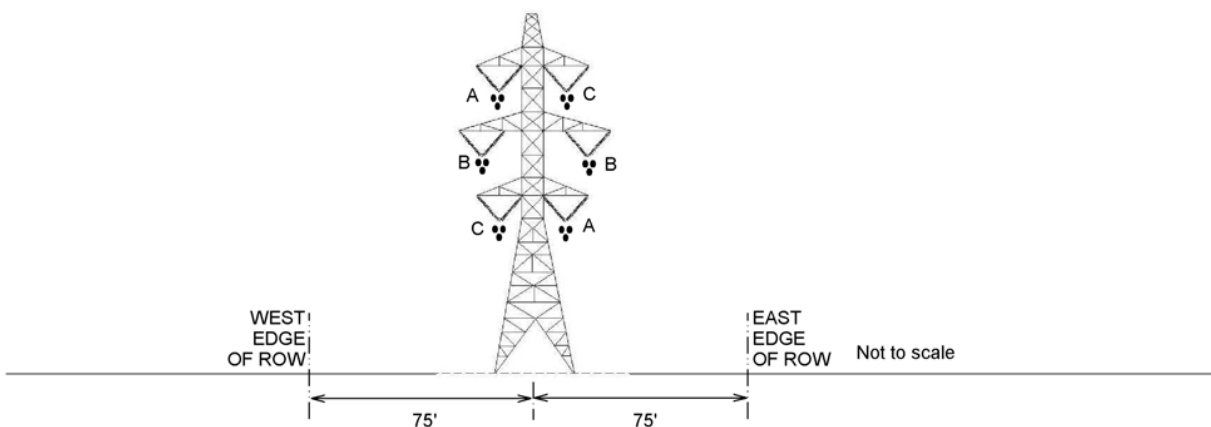


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Figure 8: Double-circuit Configurations 7 and 7A for the proposed Big Eddy – Knight 500-kV line. The current is split between the two circuits in Configuration 7. The current is only on the west circuit in Configuration 7A and the east circuit conductors carry zero current and are not grounded. Configurations are described in Tables 1 and 2.

Configuration 7

Big Eddy-Knight Proposed Double Circuit
Voltage: 536 kV (ave.), 550 kV (max.)
Current: 242.5 A per phase (ave.), 485 A per phase (max.)
Conductors:
3 x 1.6 in., 19 in. bundle spacing (7)
3 x 1.3 in., 17 in. bundle spacing (7A)

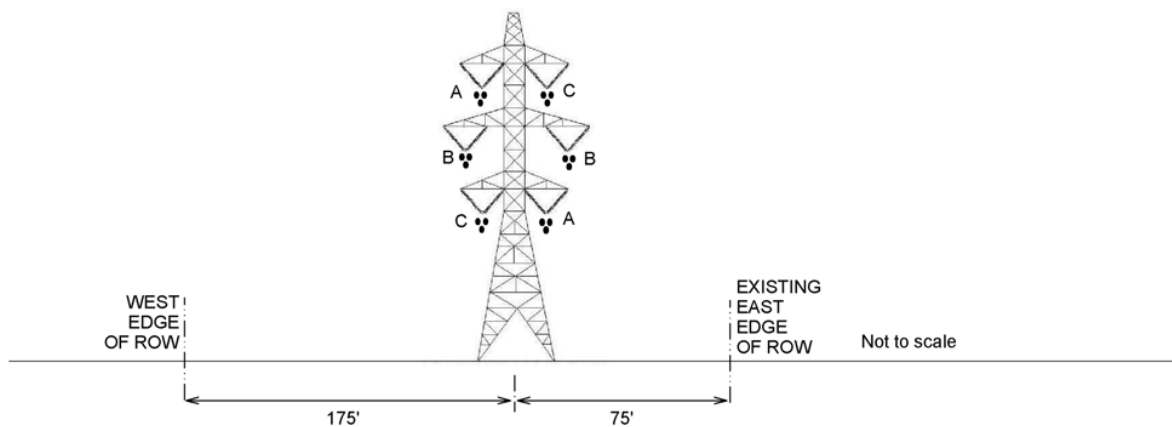


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Figure 9: Double-circuit Configuration 8 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configurations 8

Big Eddy-Knight Proposed Double Circuit	Harvalum-Big Eddy 230 kV
Voltage: 536 kV (ave.), 550 kV (max.)	Voltage: 232 kV (ave.), 241.5 kV (max.)
Current: 485 A (ave.), 970 A (max.)	Current: 505 A (ave.), 1075 A (max.)
Conductors: 3 x 1.3 in., 17 in. bundle spacing	Conductors: 3 x 1.3 in., 17 in. bundle spacing



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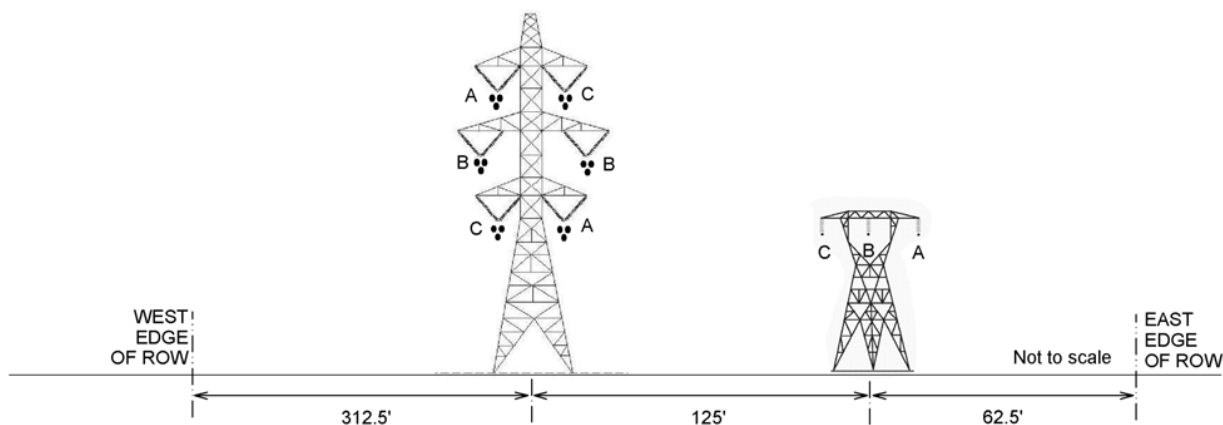
Figure 10: Double-circuit Configuration 9 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.

Configuration 9

Big Eddy-Knight Proposed Double Circuit
 See Figure 9.

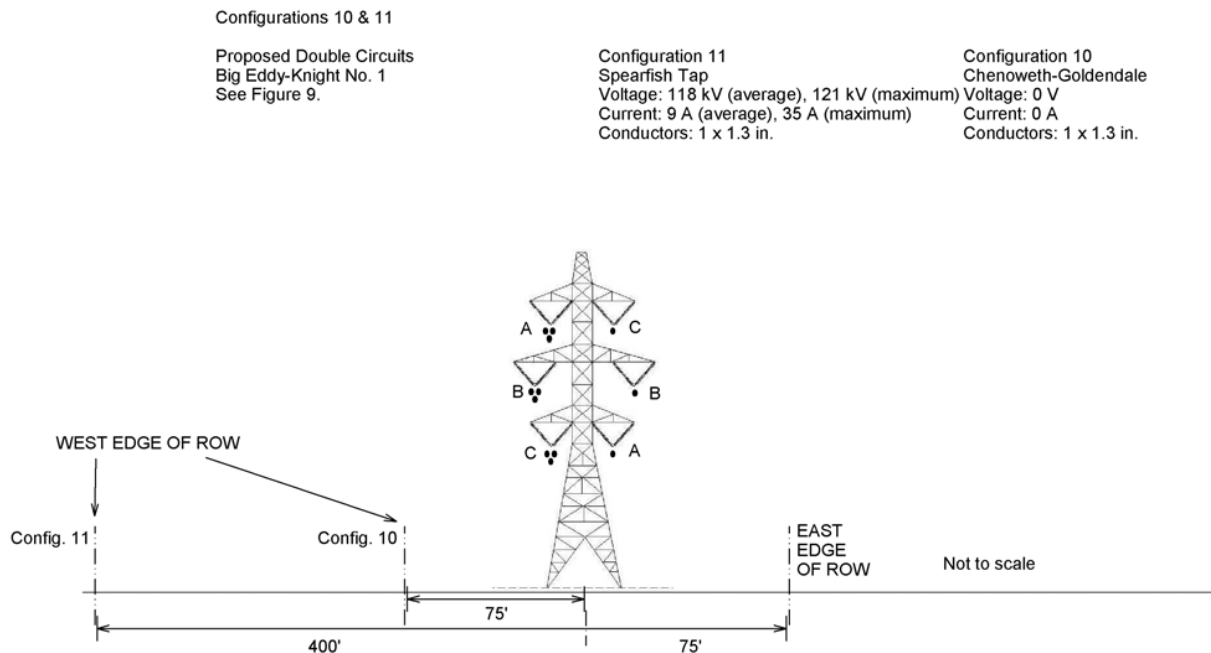
McNary-Ross
 Voltage: 350 kV (ave.), 362 kV (max.)
 Current: 380 A (ave.), 630 A (max.)
 Conductors: 3 x 1.3 in., 17 in. bundle spacing

Harvalum-Big Eddy Single Circuit
 See Figure 3.



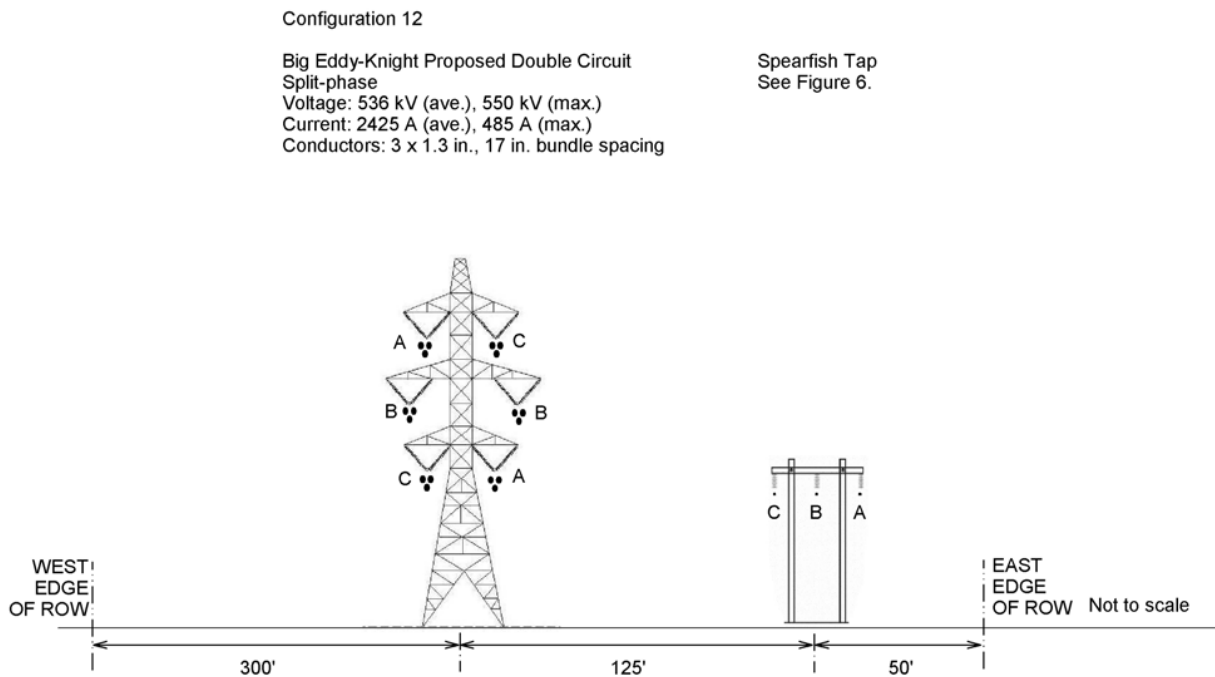
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Figure 11: Double-circuit Configurations 10 and 11 for the proposed Big Eddy – Knight 500-kV line. The west circuit will be the proposed Big Eddy – Knight line and the east circuit will be the existing Chenoweth – Goldendale line (Configuration 10) or the existing Spearfish Tap line (Configuration 11). Configurations are described in Tables 1 and 2.



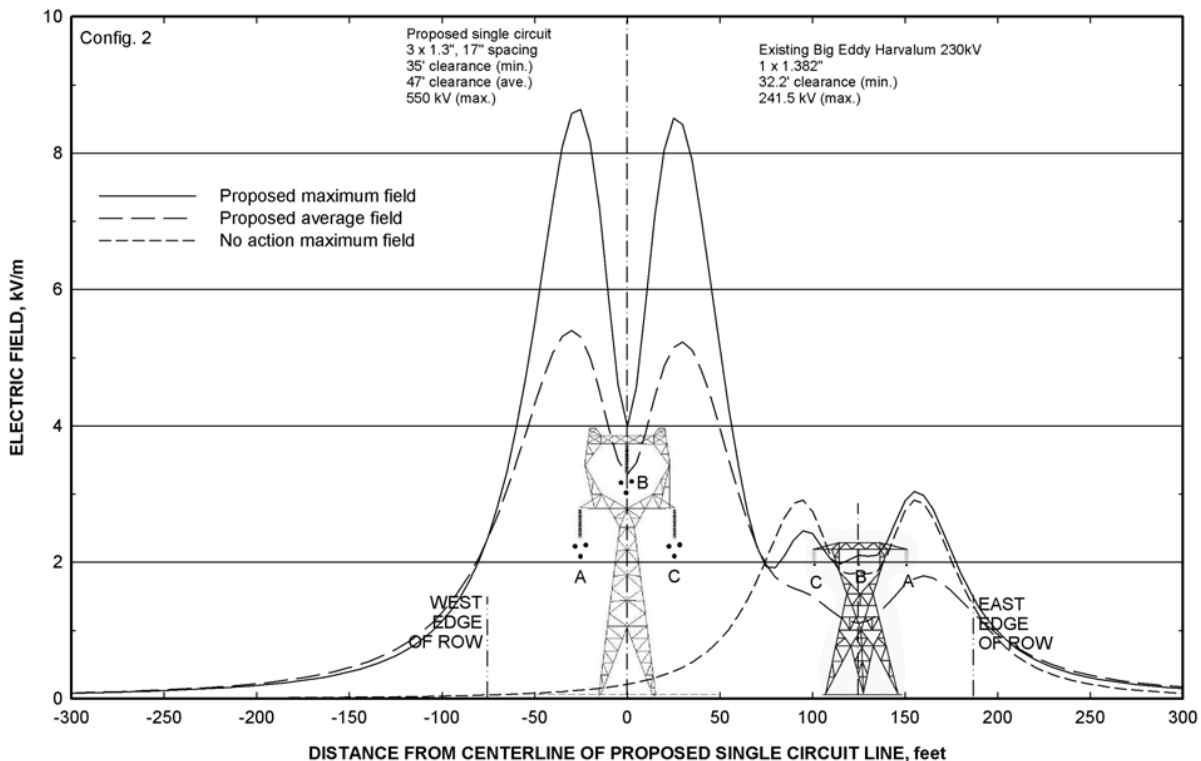
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Figure 12: Double-circuit Configuration 12 for the proposed Big Eddy – Knight 500-kV line. Configurations are described in Tables 1 and 2.



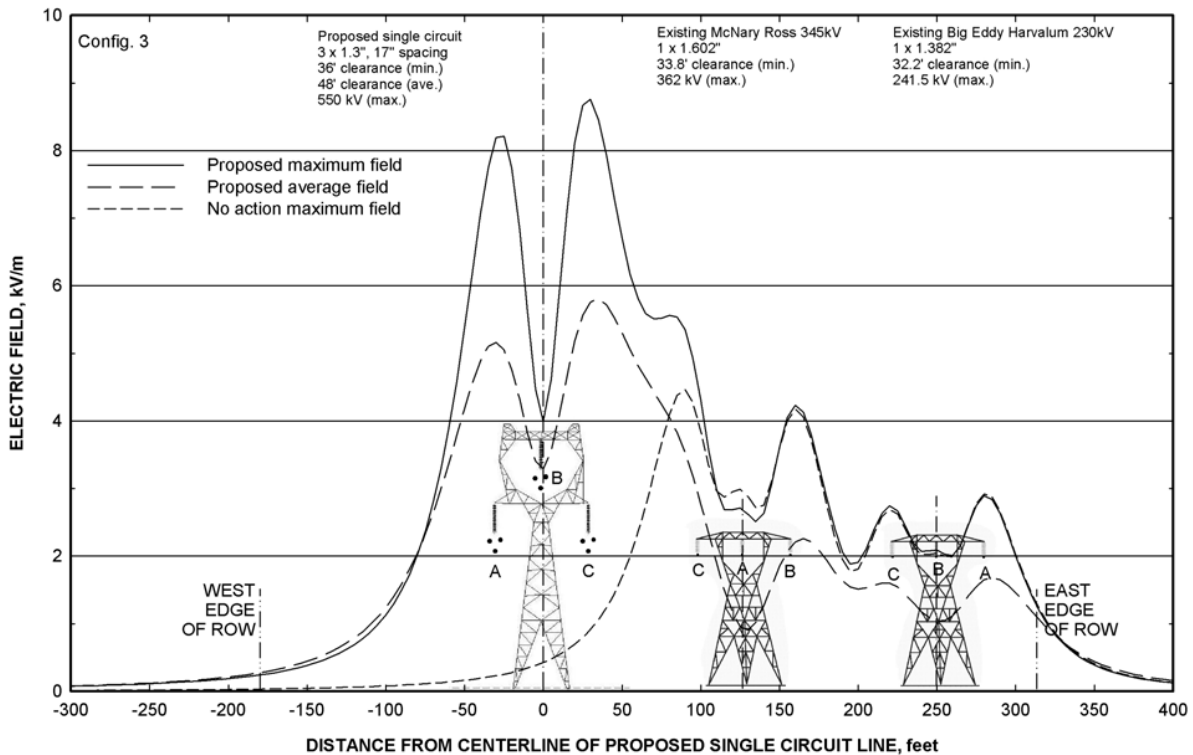
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Figure 14: Electric-field profiles for single-circuit Configuration 2 of the proposed Big Eddy – Knight 500-kV line. Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



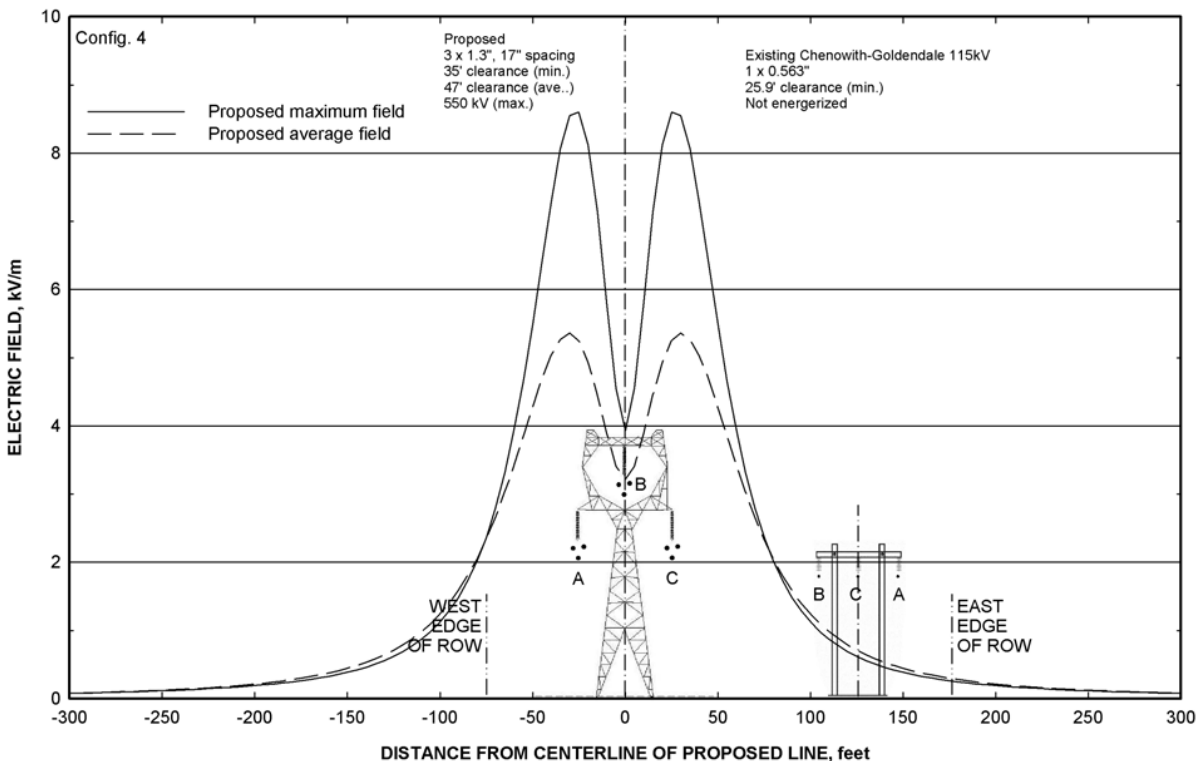
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Figure 15: Electric-field profiles for single-circuit Configuration 3 of the proposed Big Eddy – Knight 500-kV line. Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



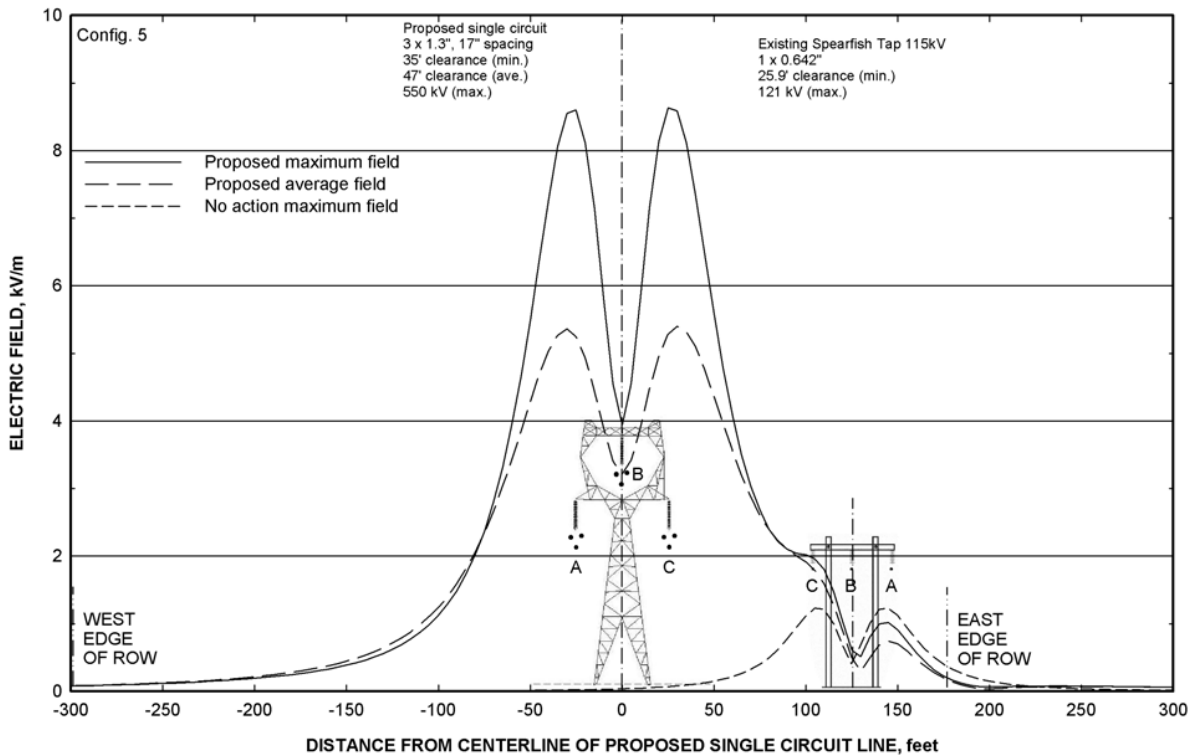
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Figure 16: Electric-field profiles for single-circuit Configuration 4 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



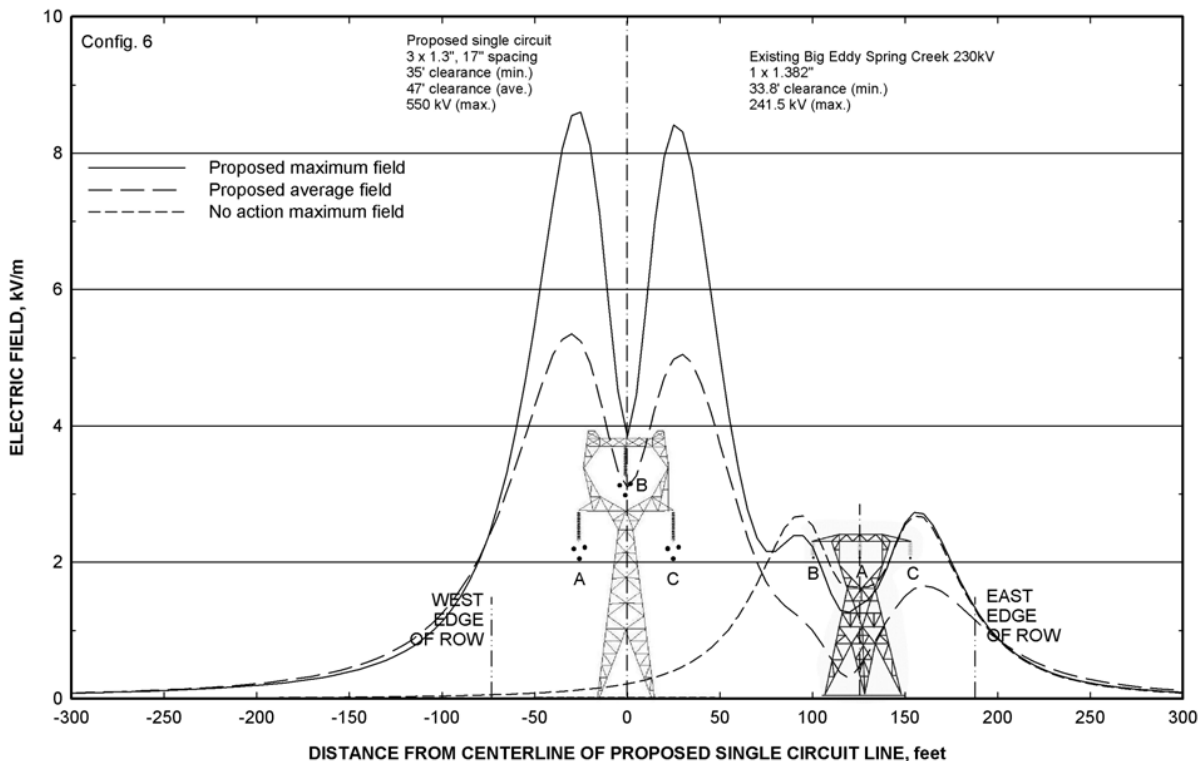
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Figure 17: Electric-field profiles for single-circuit Configuration 5 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



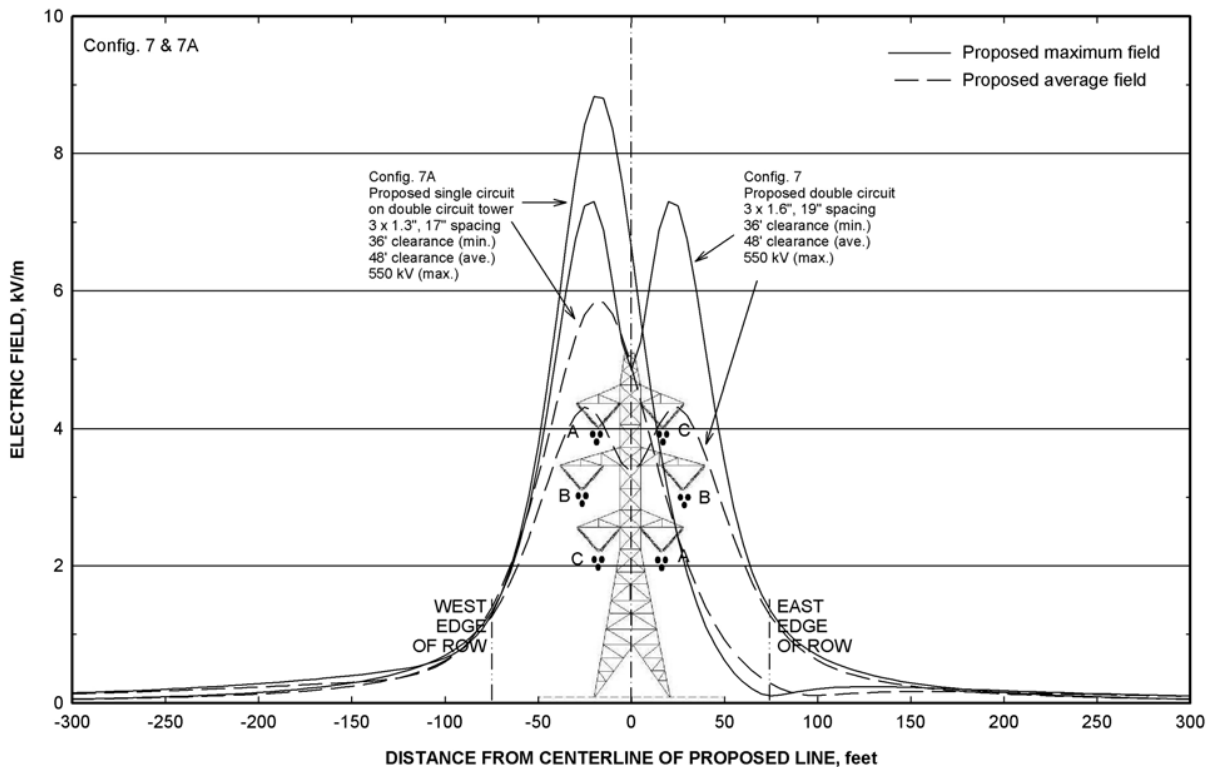
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Figure 18: Electric-field profiles for single-circuit Configuration 6 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



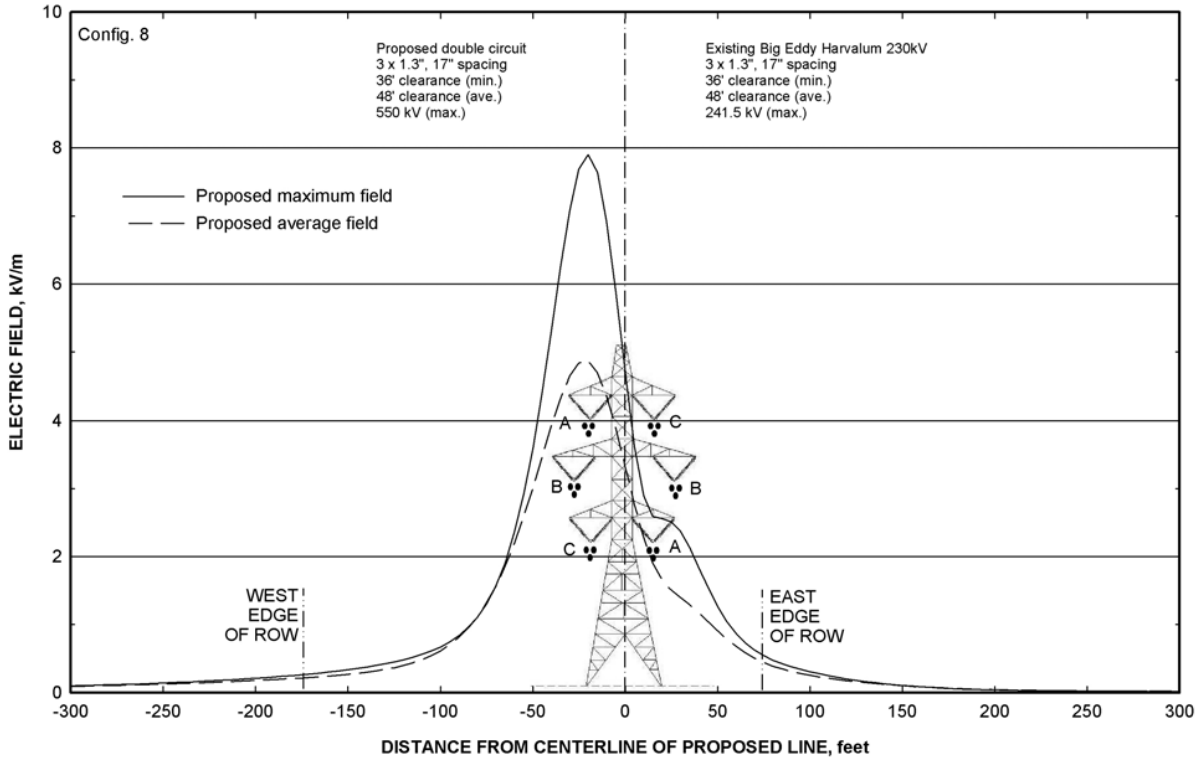
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Figure 19: Electric-field profiles for double-circuit Configurations 7 and 7A of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



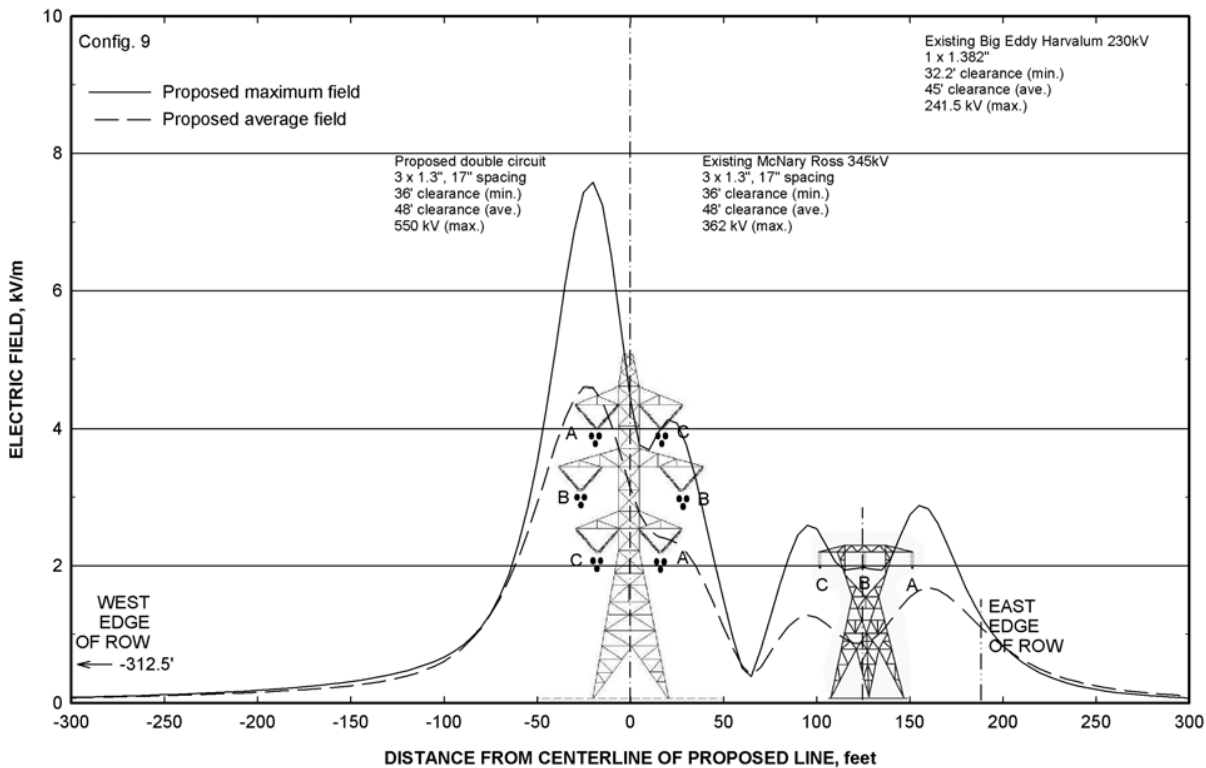
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Figure 20: Electric-field profiles for double-circuit Configuration 8 of the proposed Big Eddy – Knight 500-kV line. Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



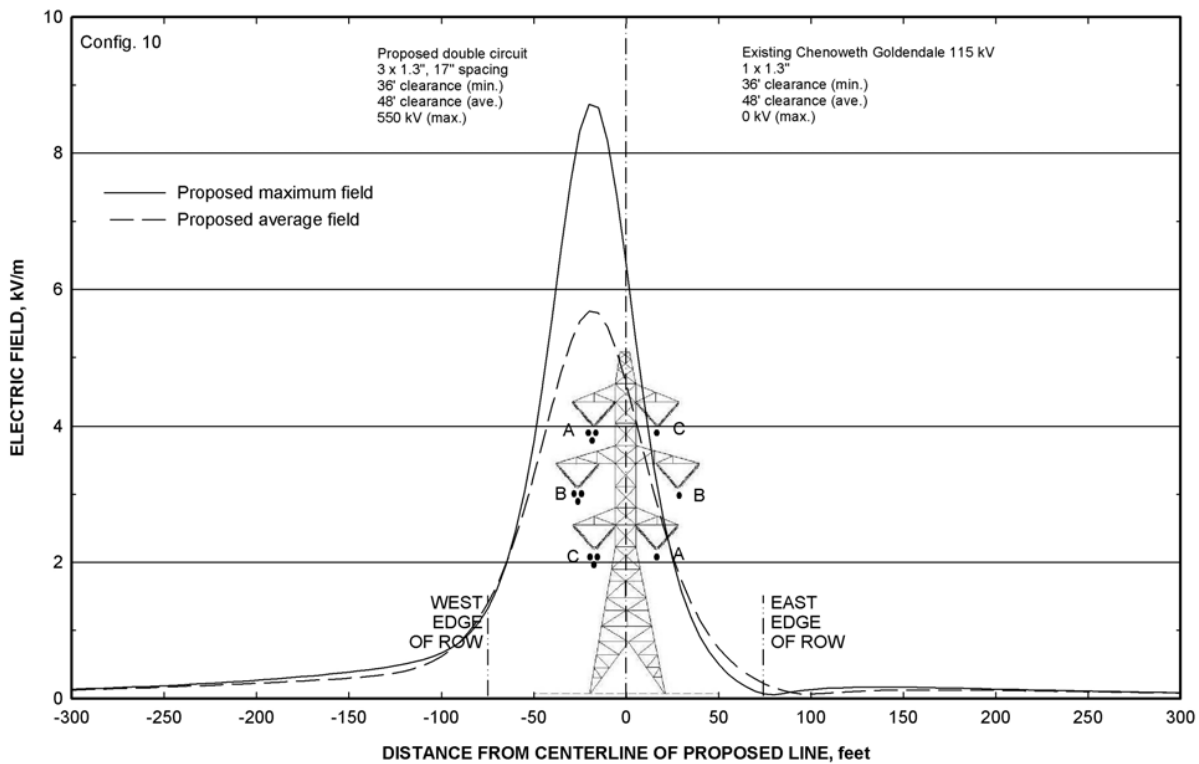
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Figure 21: Electric-field profiles for double-circuit Configuration 9 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



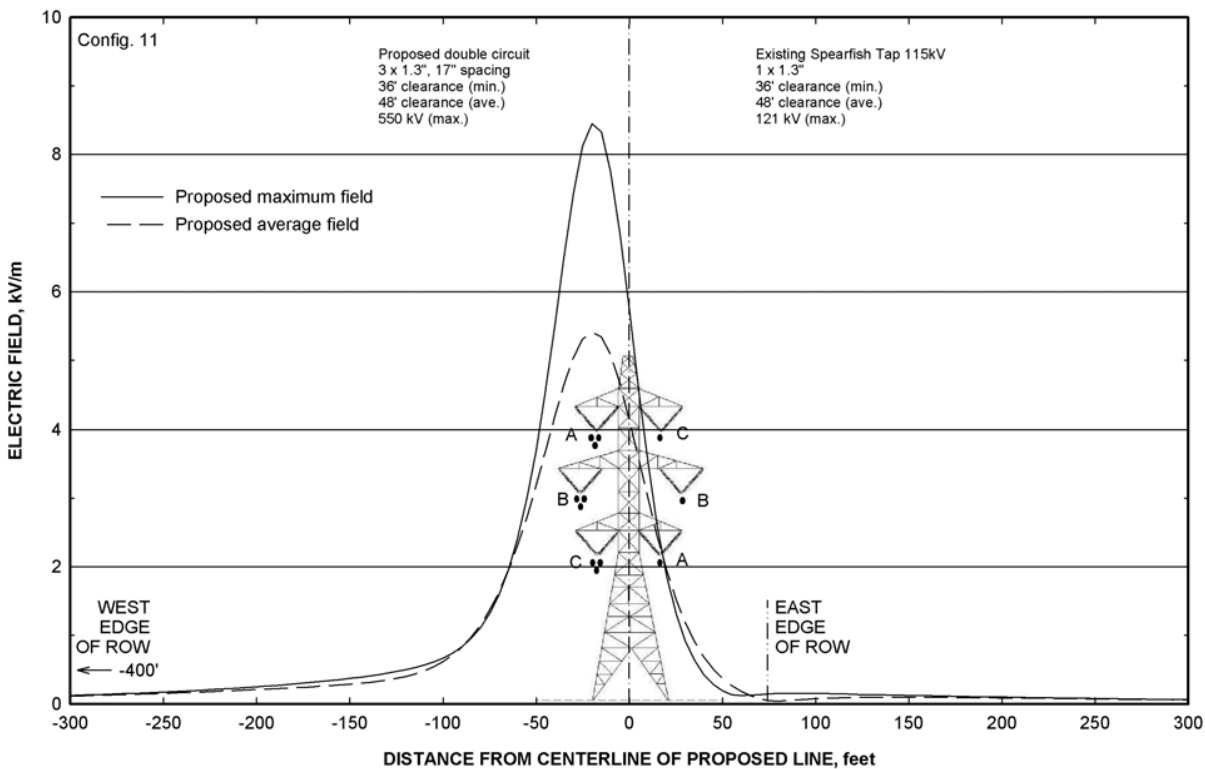
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Figure 22: Electric-field profiles for double-circuit Configuration 10 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



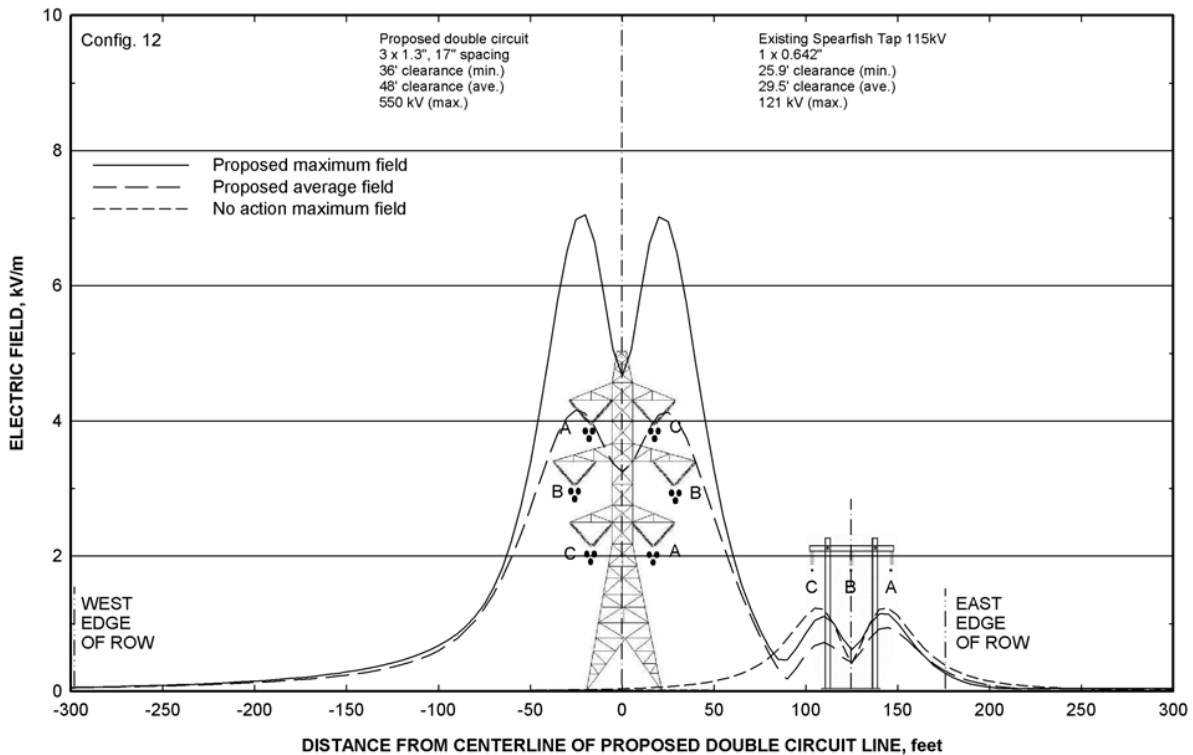
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Figure 23: Electric-field profiles for double-circuit Configuration 11 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



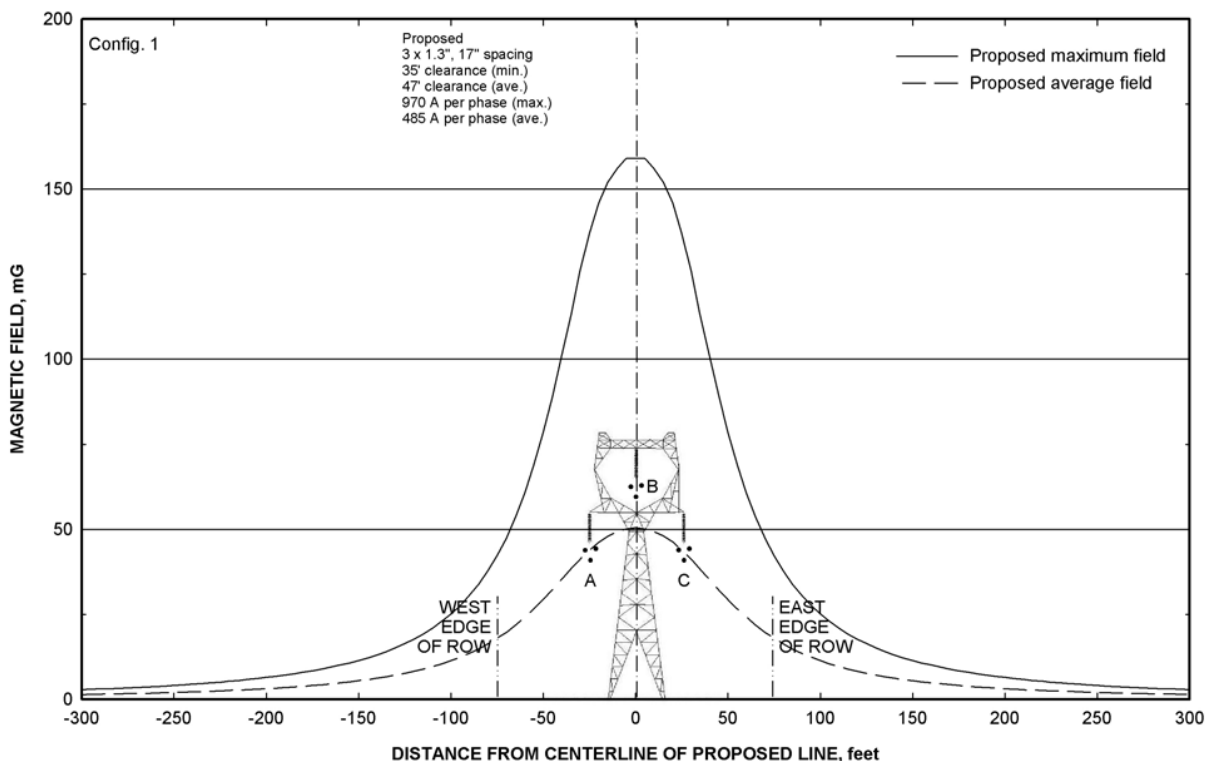
*Bonneville Power Administration/Big Eddy – Knight 500-kV Project
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Figure 24: Electric-field profiles for double-circuit Configuration 12 of the proposed Big Eddy – Knight 500-kV line: Fields for maximum voltage with minimum and average clearances are shown. Configurations are described in Tables 1 and 2.



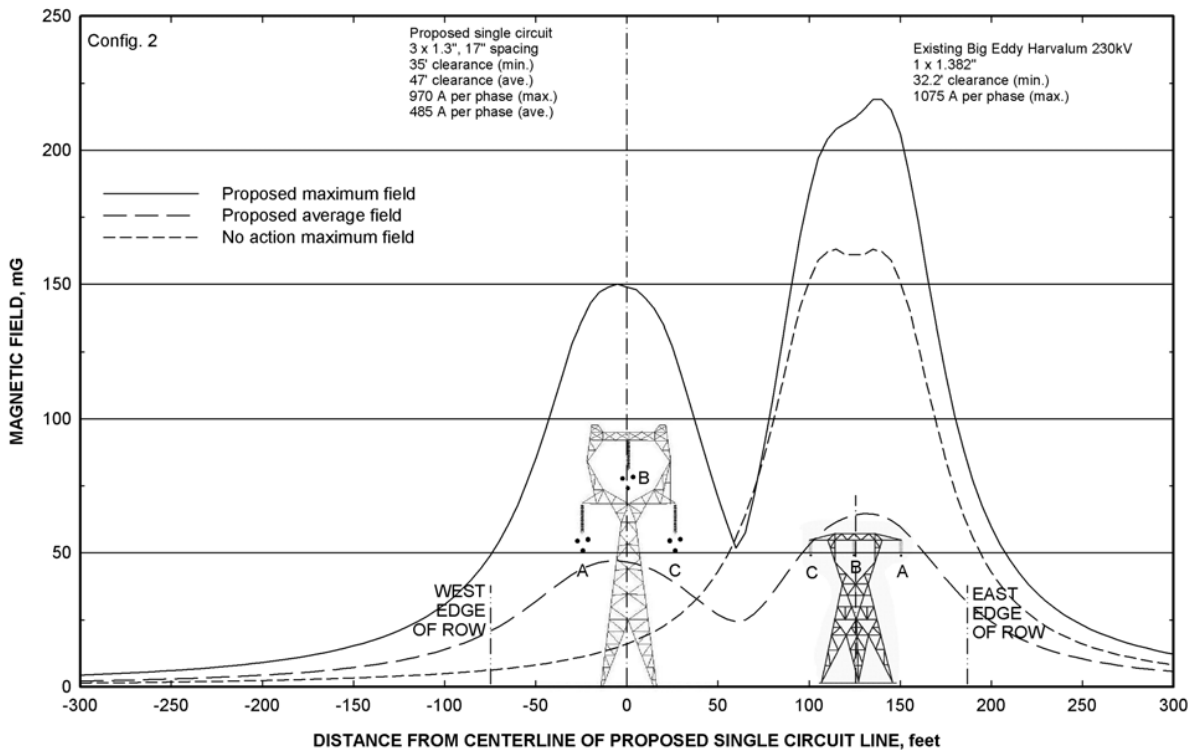
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Figure 25: Magnetic-field profiles for single-circuit Configuration 1 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



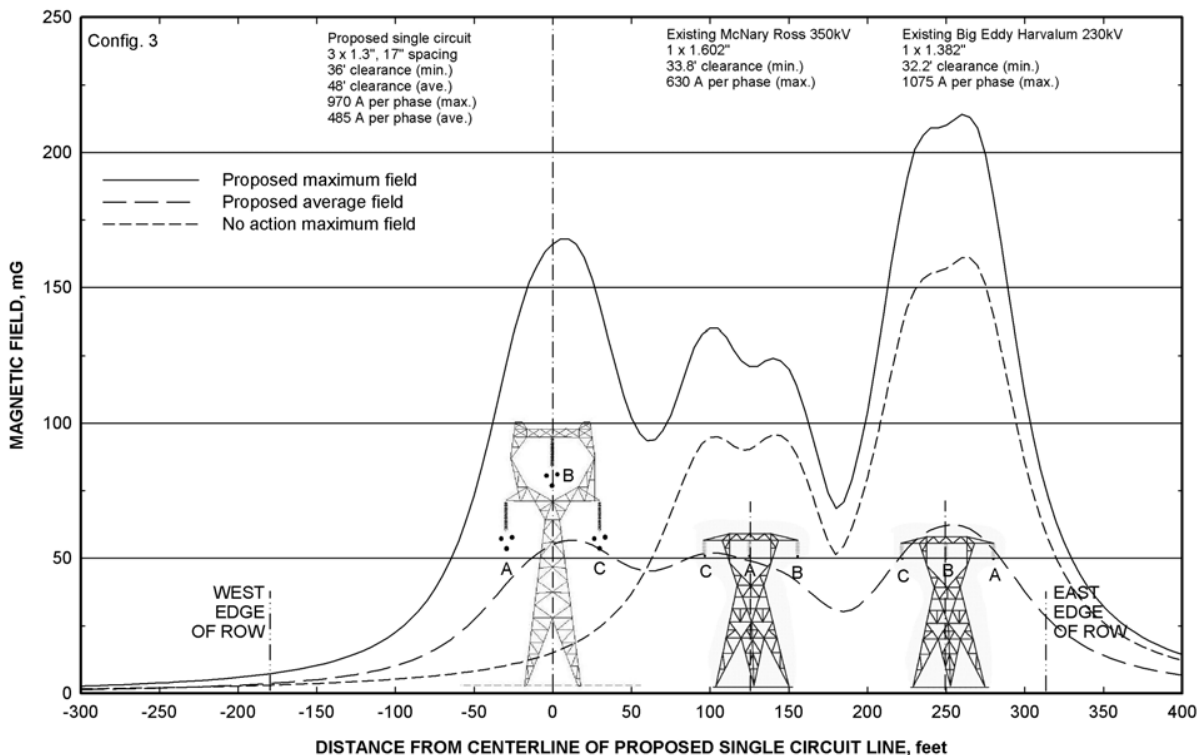
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Figure 26: Magnetic-field profiles for single-circuit Configuration 2 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



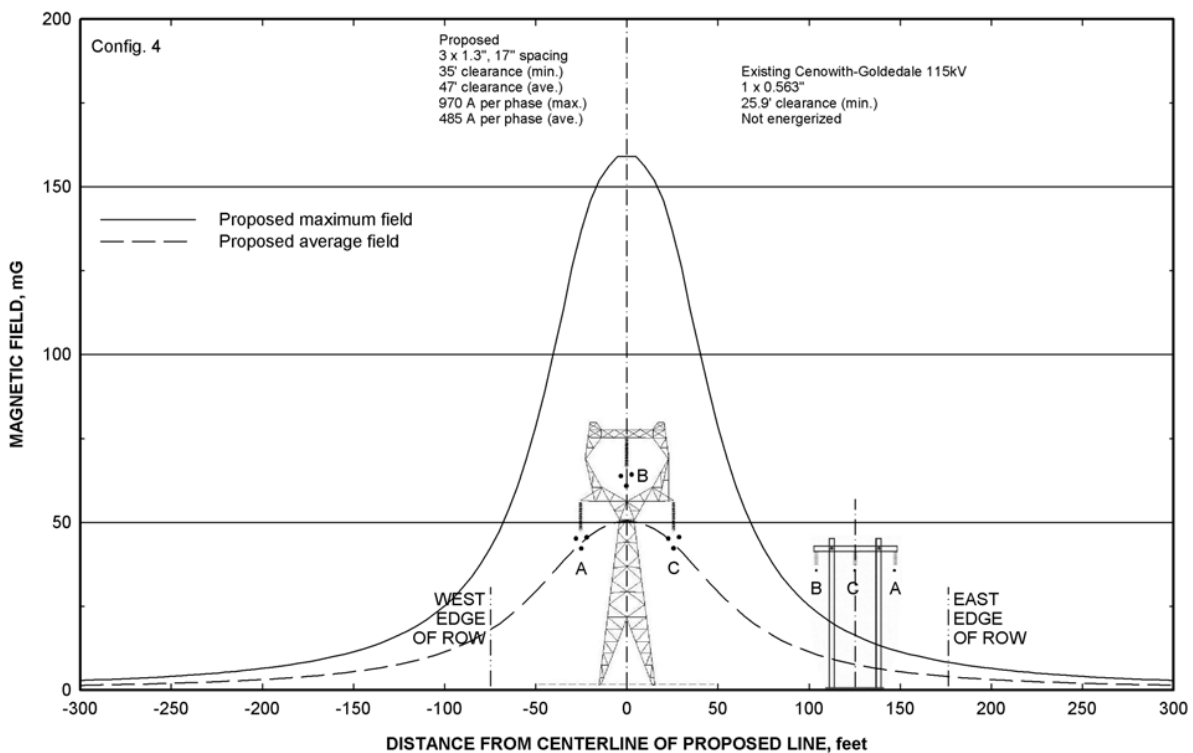
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Figure 27: Magnetic-field profiles for single-circuit Configuration 3 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



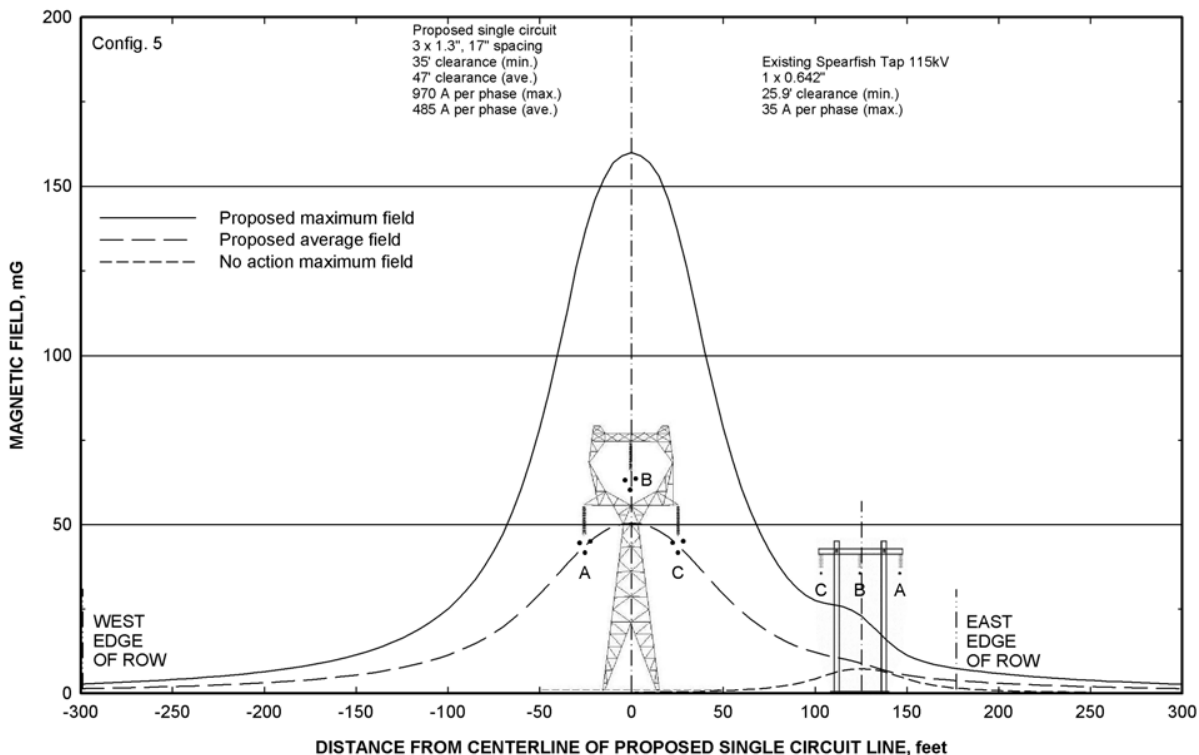
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Figure 28: Magnetic-field profiles for single-circuit Configuration 4 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



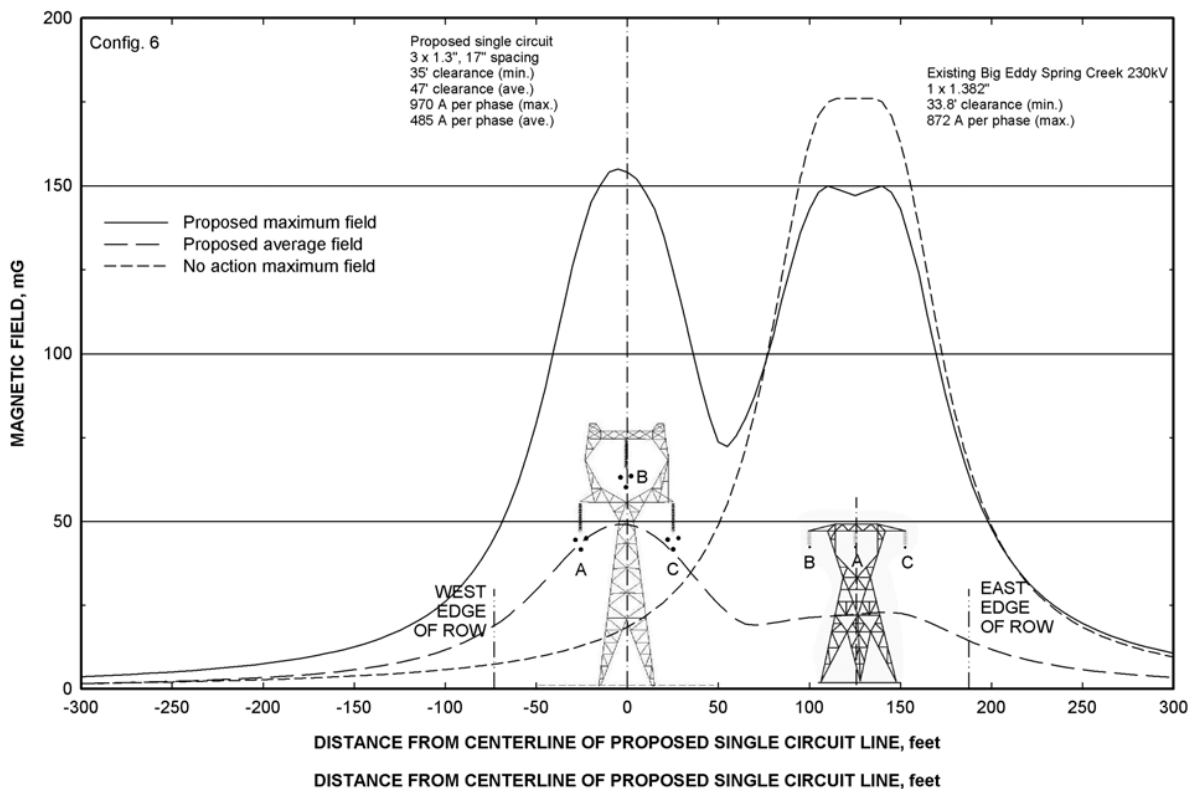
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Figure 29: Magnetic-field profiles for single-circuit Configuration 5 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



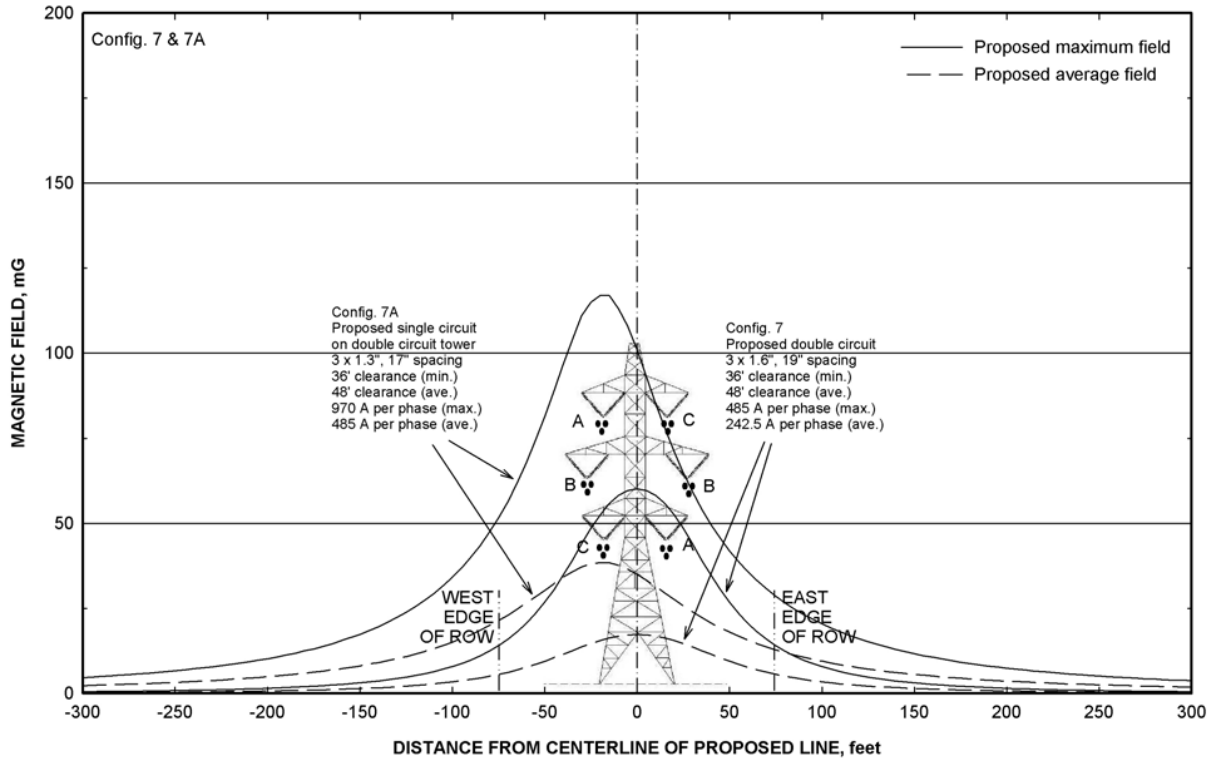
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Figure 30: Magnetic-field profiles for single-circuit Configuration 6 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



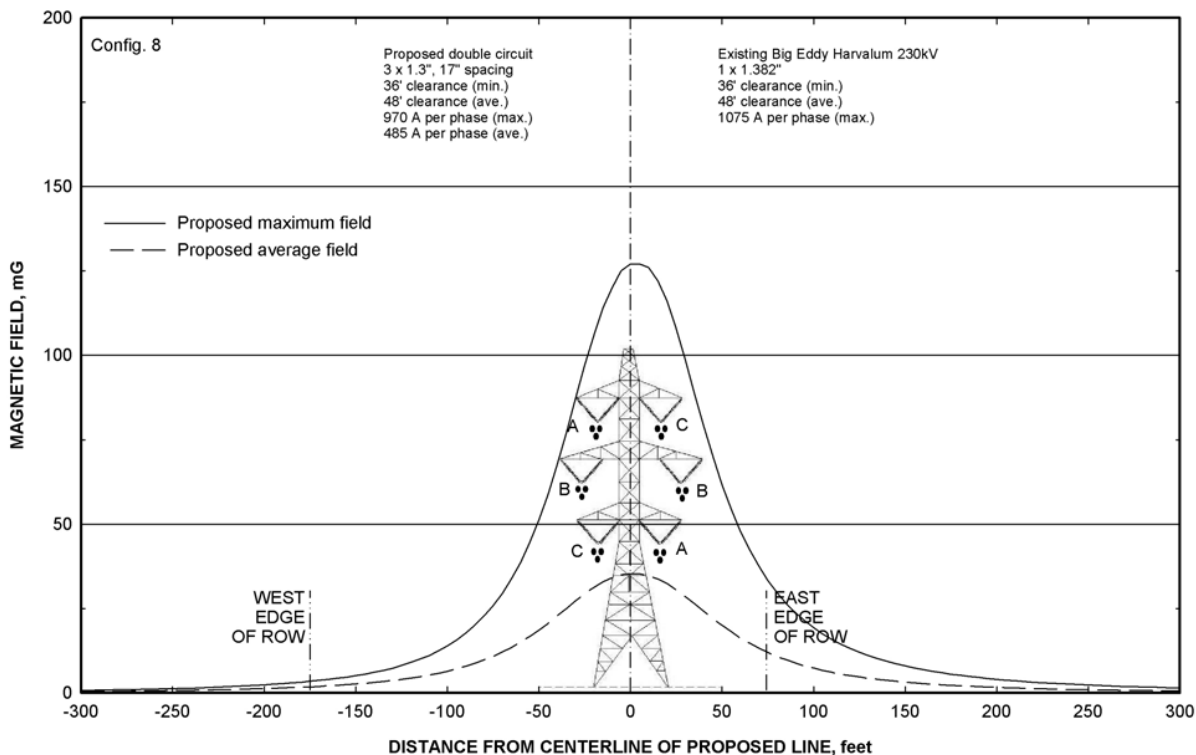
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Figure 31: Magnetic-field profiles for double-circuit Configurations 7 and 7A of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



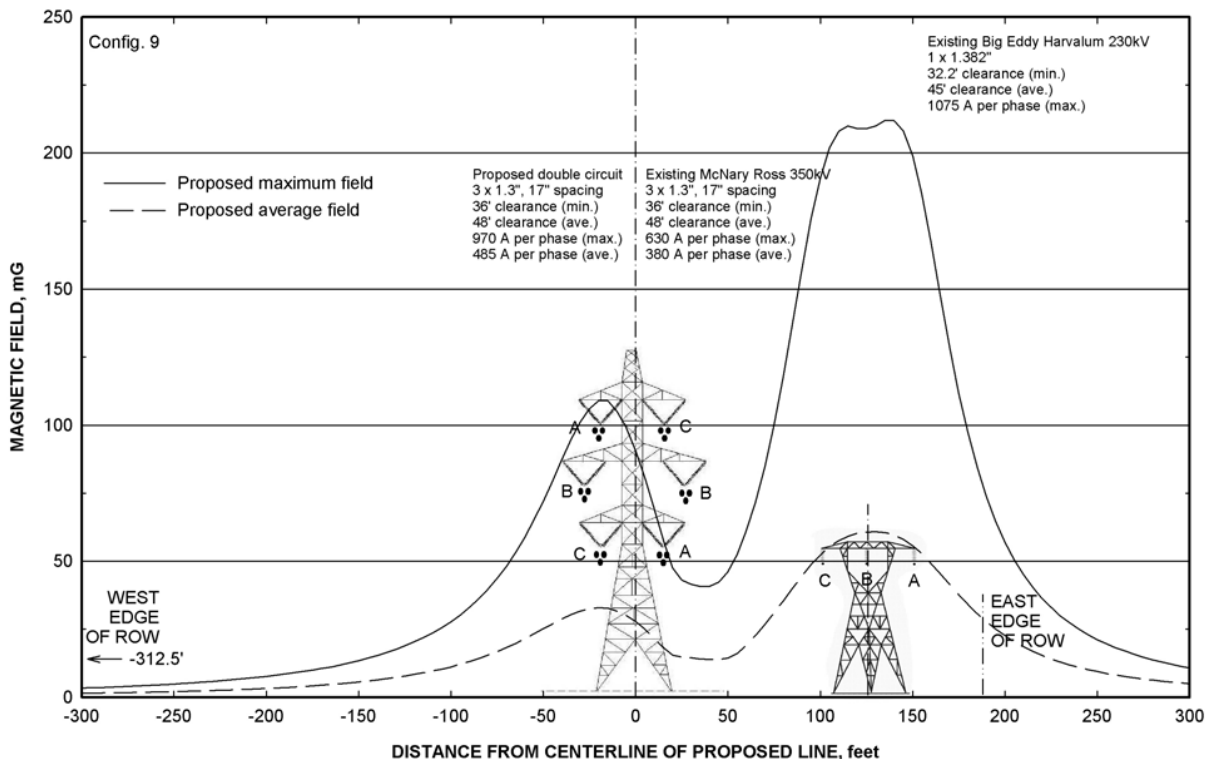
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Figure 32: Magnetic-field profiles for double-circuit Configuration 8 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



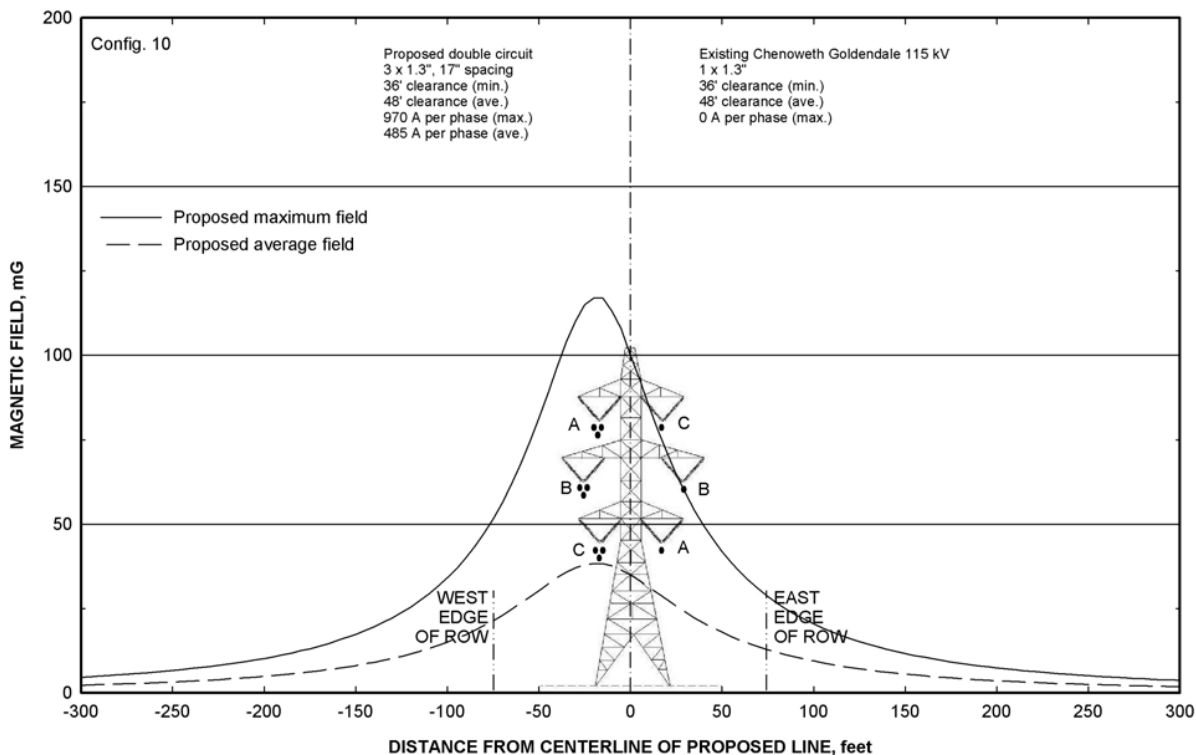
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Figure 33: Magnetic-field profiles for double-circuit Configuration 9 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



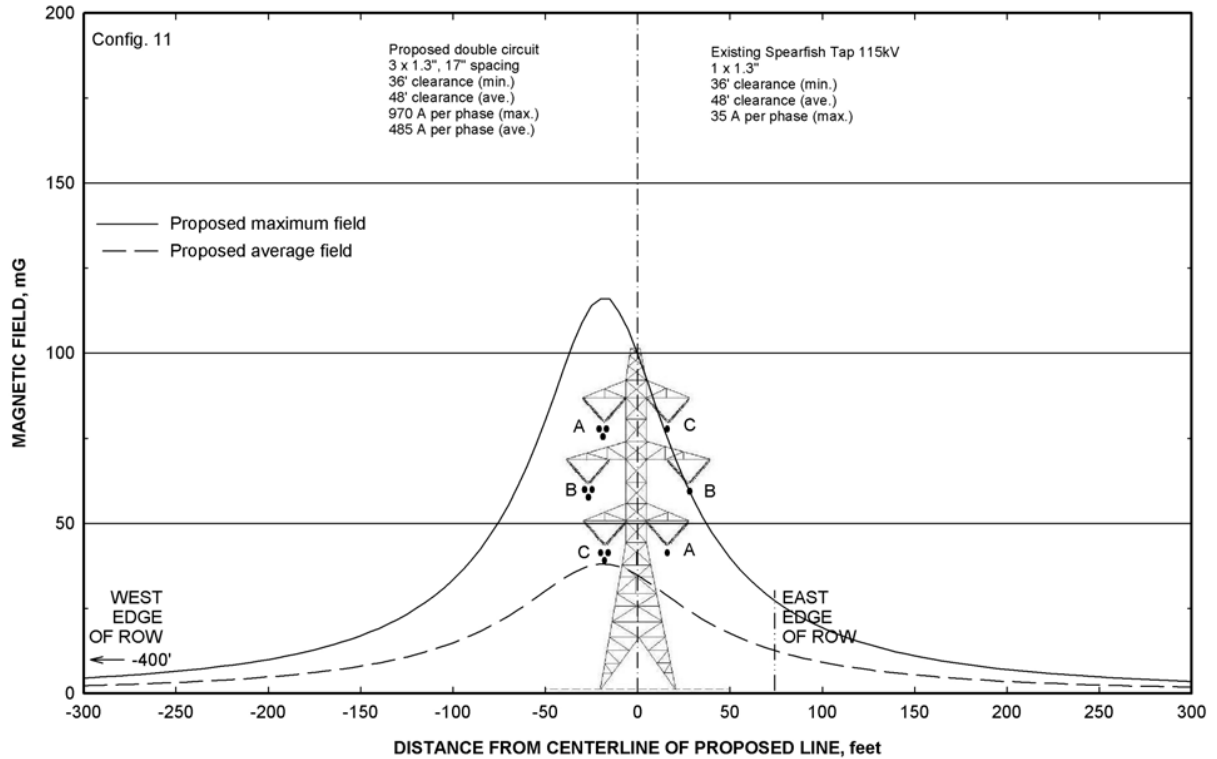
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Figure 34: Magnetic-field profiles for double-circuit Configuration 10 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



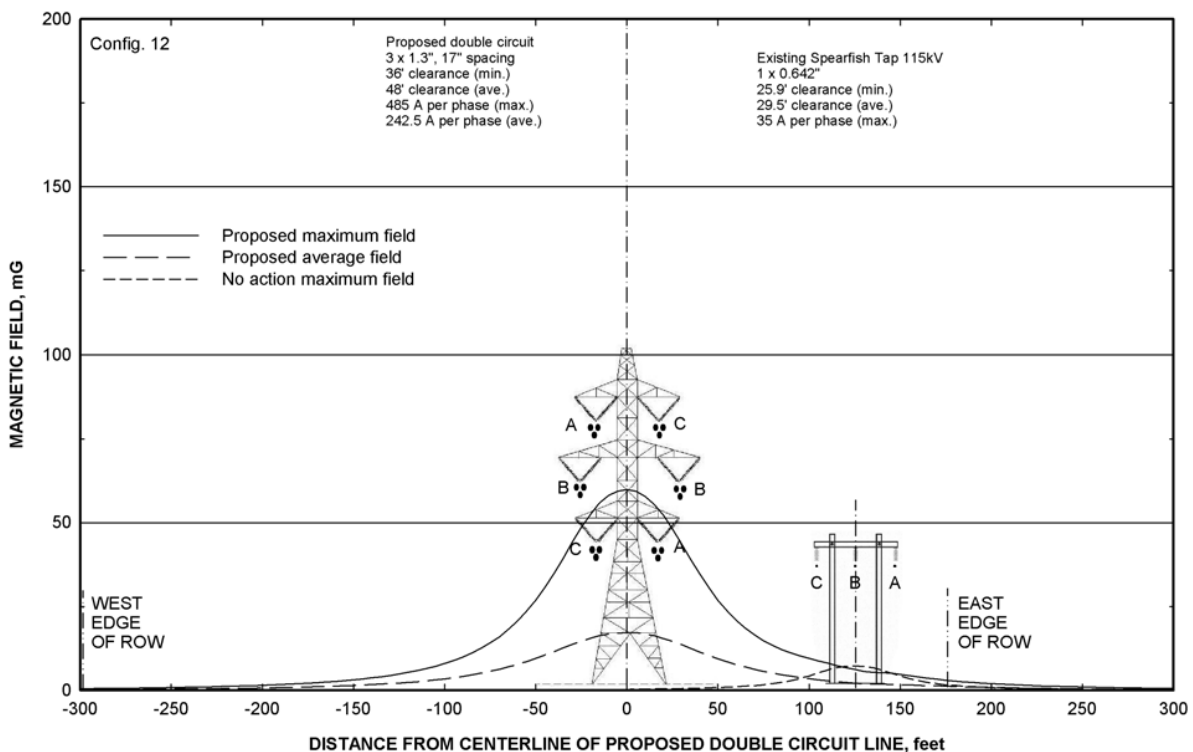
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Figure 35: Magnetic-field profiles for double-circuit Configuration 11 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



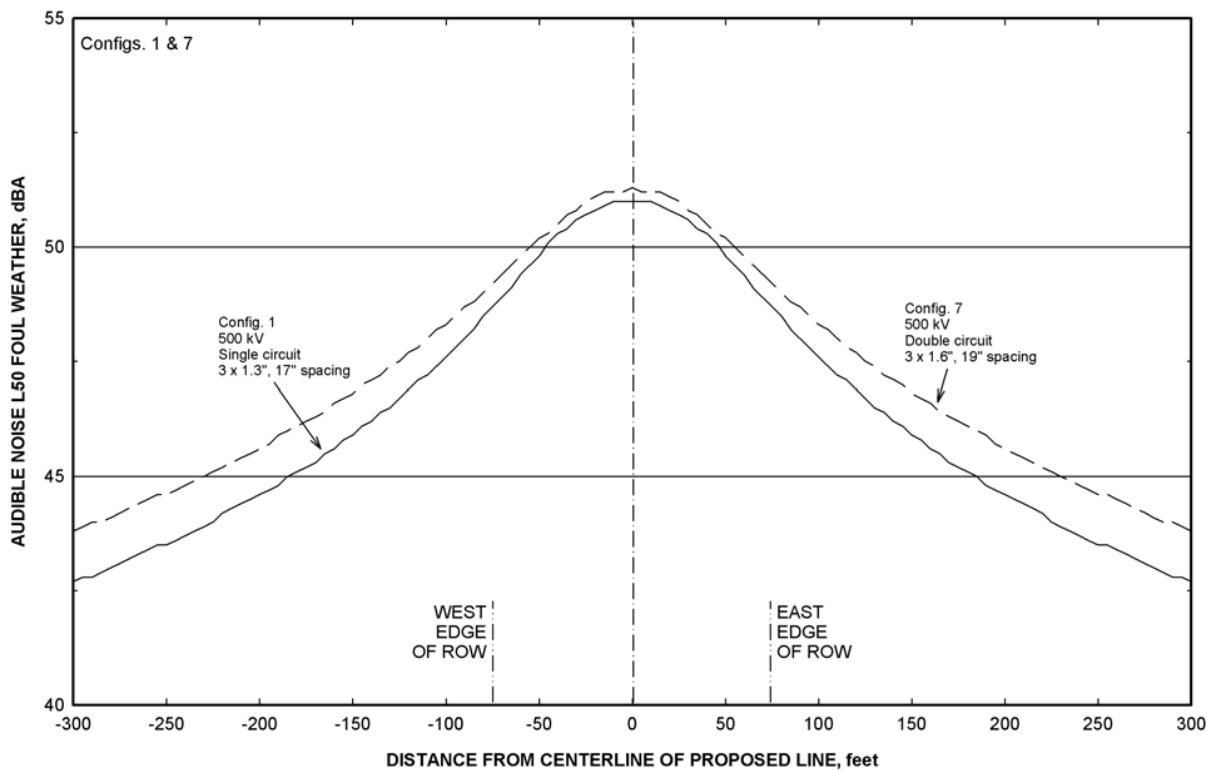
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Figure 36: Magnetic-field profiles for double-circuit Configuration 12 of the proposed Big Eddy – Knight 500-kV line. Fields computed for maximum current with minimum clearance and for average current with average clearance are shown. Configurations are described in Tables 1 and 2.



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Figure 37: Audible Noise Profile for Proposed Big Eddy – Knight 500-kV Transmission Line Configurations 1 and 7 with No Adjacent Transmission Lines. Calculations performed for average voltage and average height. Configurations are described in Tables 1 and 2.



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**Klondike III/Biglow Canyon
Wind Integration Project,
Final EIS, Appendix C
(September 2006)**

KLONDIKE III/BIGLOW CANYON WIND INTEGRATION
PROJECT

APPENDIX C
ELECTRICAL EFFECTS

JULY 2006

Prepared by

T. Dan Bracken, Inc.

for

Bonneville Power Administration

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ELECTRICAL EFFECTS FROM BPA'S PORTION OF THE KLONDIKE III/BIGLOW CANYON WIND INTEGRATION PROJECT

1.0 Introduction

The Bonneville Power Administration (BPA) is proposing to build an approximately 12-mile (mi.) (19.3-kilometer [km]) 230-kilovolt (kV) double-circuit transmission line from the existing Klondike Schoolhouse Substation east of Wasco, Oregon, to a proposed BPA John Day 230-kV Substation adjacent to BPA's existing John Day 500-kV Substation near Rufus, Oregon. The proposed line is designated the Klondike - John Day 230-kV transmission line. The proposed line would be built on new right-of-way entirely within the state of Oregon. Two alternative routes are being considered for the proposed line – the North Alternative and the Middle Alternative (Table 1). There are no existing high-voltage transmission lines that parallel the proposed line routes.

The purpose of this report is to describe and quantify the electrical effects of the proposed Klondike - John Day 230-kV transmission line and the proposed substations. These effects include the following:

- the levels of 60-hertz (Hz; cycles per second) electric and magnetic fields (EMF) at 3.28 feet (ft.) or 1 meter (m) above the ground,
- the effects associated with those fields,
- the levels of audible noise produced by the line, and
- electromagnetic interference associated with the line.

Electrical effects occur near all transmission lines, including existing 230-kV lines in Oregon and the 500-kV lines that connect into the existing BPA John Day 500-kV Substation. Therefore, the levels of these quantities for the proposed line are computed and compared with those from the existing lines in Oregon.

The voltage on the conductors of transmission lines generates an *electric field* in the space between the conductors and the ground. The electric field is calculated or measured in units of volts-per-meter (V/m) or kilovolts-per-meter (kV/m) at a height of 3.28 ft. (1 m) above the ground. The current flowing in the conductors of the transmission line generates a *magnetic field* in the air and earth near the transmission line; current is expressed in units of amperes (A). The magnetic field is expressed in milligauss (mG), and is also usually measured or calculated at a height of 3.28 ft. (1 m) above the ground. The electric field at the surface of the conductors causes the phenomenon of *corona*. Corona is the electrical breakdown or ionization of air in very strong electric fields, and is the source of audible noise, electromagnetic radiation, and visible light.

To quantify EMF levels along the route, the electric and magnetic fields from the proposed transmission line were calculated using the BPA Corona and Field Effects Program (USDOE, undated). In this program, the calculation of 60-Hz fields uses standard superposition techniques for vector fields from several line sources: in this case, the line sources are transmission-line conductors. (Vector fields have both magnitude and direction: these must be taken into account when combining fields from different sources.) Important input parameters to the computer program are voltage, current, and geometric configuration of the line. The transmission-line conductors are assumed to be straight, parallel to each other, and located above and parallel to an infinite flat ground plane. Although such conditions do not

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occur under real lines because of conductor sag and variable terrain, the validity and limitations of calculations using these assumptions have been well verified by comparisons with measurements. This approach was used to estimate fields for the proposed Klondike – John Day line, where minimum clearances were assumed to provide worst-case (highest) estimates for the fields.

Electric fields are calculated using an imaging method. Fields from the conductors and their images in the ground plane are superimposed with the proper magnitude and phase to produce the total field at a selected location.

The total magnetic field is calculated from the vector summation of the fields from currents in all the transmission-line conductors. Balanced (equal) currents are assumed for each three-phase circuit; the contribution of induced image currents in the conductive earth is not included.

Electric and magnetic fields for the proposed line were calculated at the standard height (3.28 ft. or 1 m) above the ground (IEEE, 1994). Calculations were performed out to 300 ft. (91 m) from the centerline of the existing corridor. The validity and limitations of such calculations have been well verified by measurements. Because maximum voltage, maximum current, and minimum conductor height above-ground are used, **the calculated values given here represent worst-case conditions:** i.e., the calculated fields are higher than they would be in practice. Such worst-case conditions would seldom occur.

The corona performance of the proposed line was also predicted using the BPA Corona and Field Effects Program (USDOE, undated). Corona performance is calculated using empirical equations that have been developed over several years from the results of measurements on numerous high-voltage lines (Chartier and Stearns, 1981; Chartier, 1983). The validity of this approach for corona-generated audible noise has been demonstrated through comparisons with measurements on other lines all over the United States (IEEE Committee Report, 1982). The accuracy of this method for predicting corona-generated radio and television interference from transmission lines has also been established (Olsen et al., 1992). Important input parameters to the computer program are voltage, current, conductor size, and geometric configuration of the line.

Corona is a highly variable phenomenon that depends on conditions along a length of line. Predictions of the levels of corona effects are reported in statistical terms to account for this variability. Calculations of audible noise and electromagnetic interference levels were made under conditions of an estimated average operating voltage of 237 kV and with the average line height along a span of 38.5 ft. (11.7 m). Levels of audible noise, radio interference, and television interference are predicted for both fair and foul weather; however, corona is basically a foul-weather phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. In the Rufus-Wasco area of the proposed route, such conditions are expected to occur about 6% of the time during a year based on hourly precipitation records from Moro, Oregon (near Wasco) during 2000 – 2004 (NOAA, 2005). Corona activity also increases with altitude. For purposes of evaluating corona effects from the proposed line, an altitude of 1500 ft. (460 m) was assumed.

2.0 Physical Description

2.1 Proposed Line

The proposed 230-kV transmission line would be a three-phase, double-circuit line placed on mostly tubular steel structures. (Some towers would be lattice steel construction, for example where the line changed direction. The double-circuit towers would have two sets of three phases arranged vertically on either side of the structure. Each set of phase wires comprises a circuit. Voltage and current waves are

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displaced by 120° in time (one-third of a cycle) on each electrical phase. The maximum phase-to-phase voltage would be 242 kV; the average voltage would be 237 kV.

The line would be operated with the load from the Biglow Canyon project on one of the circuits and the load from the Klondike III project on the other. Initially the projected peak loads for the two circuits of the proposed line are: 400 megawatts (MW) for the Biglow Canyon circuit and 300 MW for the Klondike circuit. When the Orion project is completed the peak load on the Biglow Canyon circuit would increase to 600 MW. These loads correspond to an initial maximum current per phase of 974 A on the Biglow Canyon circuit, increasing to 1462 A with the addition of the Orion load, and 731 A on the Klondike circuit. The Orion project load could be added in the future and is only considered as a cumulative impact with the proposed project.

The load factor for wind power is 0.30 (average load = peak load x load factor). Thus, the average currents on each circuit would be 30 percent of the maximum values. BPA provided the physical and operating characteristics of the proposed line.

The electrical characteristics and physical dimensions for the proposed line configuration are shown in Figure 1, and summarized in Table 2. Each phase of the proposed 230-kV line would have one 1.6-inch (in.) (4.06-centimeter [cm]) diameter conductors (AAC: all aluminum conductors).

The horizontal phase spacing between the lower and upper conductor positions would be 20.0 ft. (6.1 m). Between the middle conductors, the horizontal spacing would be 32.0 ft. (9.76 m). The vertical spacing between the conductor positions would be 18.0 ft. (5.49 m). The spacing between conductor locations would vary slightly where special towers are used, such as at angle points along the line. Short sections of the proposed line where conductor locations would change, such as upon entry to a substation, were not analyzed.

Minimum conductor-to-ground clearance would be 26.5 ft. (8.08 m) at a conductor temperature of 212°F (100°C); clearances above ground would be greater under normal operating temperatures. The average clearance above ground along a span would be approximately 38.5 ft. (11.7 m); this value was used for corona calculations. At road crossings, the ground clearance would be at least 37.5 ft. (11.4 m). The final design of the proposed line could entail larger clearances. The right-of-way width for the proposed line would be 125 ft. (38.11 m).

The electrical phasing of the proposed line would be selected to ensure that BPA criteria for electric-field and audible-noise levels are met and to minimize magnetic field to the extent practical. The results reported here for fields and corona effects assume that the electrical phasing of the two circuits would be such as to place different electrical phases on the lower conductors of each circuit and on the upper conductors of each circuit. This phasing configuration tends to minimize the fields at ground level. During the design process, BPA will verify that any changes from the phasing described here continue to meet design criteria.

2.2 Existing Lines

There are no existing transmission lines parallel to the proposed routes.

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3.0 Electric Field

3.1 Basic Concepts

An electric field is said to exist in a region of space if an electrical charge, at rest in that space, experiences a force of electrical origin (i.e., electric fields cause free charges to move). Electric field is a vector quantity: that is, it has both magnitude and direction. The direction corresponds to the direction that a positive charge would move in the field. Sources of electric fields are unbalanced electrical charges (positive or negative) and time-varying magnetic fields. Transmission lines, distribution lines, house wiring, and appliances generate electric fields in their vicinity because of unbalanced electrical charge on energized conductors. The unbalanced charge is associated with the voltage on the energized system. On the power system in North America, the voltage and charge on the energized conductors are cyclic (plus to minus to plus) at a rate of 60 times per second. This changing voltage results in electric fields near sources that are also time-varying at a frequency of 60 hertz (Hz; a frequency unit equivalent to cycles per second).

As noted earlier, electric fields are expressed in units of volts per meter (V/m) or kilovolts (thousands of volts) per meter (kV/m). Electric- and magnetic-field magnitudes in this report are expressed in root-mean-square (rms) units. For sinusoidal waves, the rms amplitude is given as the peak amplitude divided by the square root of two.

The spatial uniformity of an electric field depends on the source of the field and the distance from that source. On the ground, under a transmission line, the electric field is nearly constant in magnitude and direction over distances of several feet (1 meter). However, close to transmission- or distribution-line conductors, the field decreases rapidly with distance from the conductors. Similarly, near small sources such as appliances, the field is not uniform and falls off even more rapidly with distance from the device. If an energized conductor (source) is inside a grounded conducting enclosure, then the electric field outside the enclosure is zero, and the source is said to be shielded.

Electric fields interact with the charges in all matter, including living systems. When a conducting object, such as a vehicle or person, is located in a time-varying electric field near a transmission line, the external electric field exerts forces on the charges in the object, and electric fields and currents are induced in the object. If the object is grounded, then the total current induced in the body (the "short-circuit current") flows to earth. The distribution of the currents within, say, the human body, depends on the electrical conductivities of various parts of the body: for example, muscle and blood have higher conductivity than bone and would therefore experience higher currents.

At the boundary surface between air and the conducting object, the field both in the air and perpendicular to the conductor surface is much, much larger than the field in the conductor itself. For example, the average surface field on a human standing in a 10 kV/m field is 27 kV/m; the internal fields in the body are much smaller: approximately 0.008 V/m in the torso and 0.45 V/m in the ankles.

3.2 Transmission-line Electric Fields

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, towers, vegetation, buildings, vehicles, and people. The calculated strength of the electric field at a height of 3.28 ft. (1 m) above an unvegetated, flat earth is frequently used to describe the electric field under straight, parallel transmission lines. The most important transmission-line parameters that determine the electric field at a 1-m height are conductor height above ground and line voltage.

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Calculations of electric fields from transmission lines are performed with computer programs based on well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values under these conditions represent an ideal situation. When practical conditions approach this ideal model, measurements and calculations agree. Often, however, conditions are far from ideal because of variable terrain and vegetation. In these cases, fields are calculated for ideal conditions, with the lowest conductor clearances to provide upper bounds on the electric field under the transmission lines. With the use of more complex models or empirical results, it is also possible to account accurately for variations in conductor height, topography, and changes in line direction. Because the fields from different sources add vectorially, it is possible to compute the fields from several different lines if the electrical and geometrical properties of the lines are known. However, in general, electric fields near transmission lines with vegetation below are highly complex and cannot be calculated. Measured fields in such situations are highly variable.

For evaluation of EMF from transmission lines, the fields must be calculated for a specific line condition. The NESC states the condition for evaluating electric-field-induced short-circuit current for lines with voltage above 98 kV, line-to-ground, as follows: conductors are at a minimum clearance from ground corresponding to a conductor temperature of 122°F (50°C), and at a maximum voltage (IEEE, 2002). BPA has supplied the information for calculating electric and magnetic fields from the proposed transmission line: the maximum operating voltage, the estimated peak currents, and the minimum conductor clearances. The minimum clearances (100°C) provided by BPA are lower than those specified in the NESC (50°C). If the fields under the lower BPA conductor clearances meet the NESC criterion, they will also meet the criterion at the NESC specified clearance.

There are standard techniques for measuring transmission-line electric fields (IEEE, 1994). Provided that the conditions at a measurement site closely approximate those of the ideal situation assumed for calculations, measurements of electric fields agree well with the calculated values. If the ideal conditions are not approximated, the measured field can differ substantially from calculated values. Usually the actual electric field at ground level is reduced from the calculated values by various common objects that act as shields.

Maximum or peak field values occur over a small area at midspan, where conductors are closest to the ground. As the location of an electric-field profile approaches a tower, the conductor clearance increases, and the peak field decreases. A grounded tower will reduce the electric field considerably, by shielding. **Thus the assumption of minimum clearance results in peak (worst-case) fields that may be larger than what occur in practice.**

For traditional transmission lines, such as the proposed line, where the right-of-way extends laterally well beyond the conductors, electric fields at the edge of the right-of-way are not as sensitive as the peak field to conductor height. Computed values at the edge of the right-of-way for any line height are fairly representative of what can be expected all along the transmission-line corridor. However, the presence of vegetation on and at the edge of the right-of-way will reduce actual electric-field levels below calculated values.

3.3 Calculated Values of Electric Fields

Table 3 shows the calculated values of electric field at 3.28 ft. (1 m) above ground for the proposed Klondike - John Day 230-kV transmission-line operated at maximum voltage. The peak value on the right-of-way and the value at the edge of the right-of-way are given for the proposed line at minimum conductor clearance and at the estimated average clearance over a span. Figure 2 shows lateral profiles for the electric field from the proposed line at the minimum and average line heights.

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The calculated peak electric field expected on the right-of-way of the proposed line is 2.5 kV/m. For average clearance, the peak field would be 1.2 kV/m or less. As shown in Figure 2, the peak values would be present only at locations directly under the 230-kV line, near mid-span, where the conductors are at the minimum clearance. The conditions of minimum conductor clearance at maximum current and maximum voltage occur very infrequently. The calculated peak levels are rarely reached under real-life conditions, because the actual line height is generally above the minimum value used in the computer model, because the actual voltage is below the maximum value used in the model, and because vegetation within and near the edge of the right-of-way tends to shield the field at ground level. Maximum electric fields on existing 230-kV corridors are typically 2.5 to 3 kV/m. On 500-kV transmission line corridors, the maximum electric fields range from 7 to 9 kV/m.

The largest value expected at the edge of the right-of-way of the proposed line is 0.3 kV/m decreasing to about 0.2 kV/m opposite conductors at average clearance.

3.4 Environmental Electric Fields

The electric fields associated with the Klondike - John Day 230-kV line can be compared with those found in other environments. Sources of 60-Hz electric (and magnetic) fields exist everywhere electricity is used; levels of these fields in the modern environment vary over a wide range. Electric-field levels associated with the use of electrical energy are orders of magnitude greater than naturally occurring 60-Hz fields of about 0.0001 V/m, which stem from atmospheric and extraterrestrial sources.

Electric fields in outdoor, publicly accessible places range from less than 1 V/m to 12 kV/m; the large fields exist close to high-voltage transmission lines of 230 kV or higher. In remote areas without electrical service, 60-Hz field levels can be much lower than 1 V/m. Electric fields in home and work environments generally are not spatially uniform like those of transmission lines; therefore, care must be taken when making comparisons between fields from different sources such as appliances and electric lines. In addition, fields from all sources can be strongly modified by the presence of conducting objects. However, it is helpful to know the levels of electric fields generated in domestic and office environments in order to compare commonly experienced field levels with those near transmission lines.

Numerous measurements of residential electric fields have been reported for various parts of the United States, Canada, and Europe. Although there have been no large studies of residential electric fields, sufficient data are available to indicate field levels and characteristics. Measurements of domestic 60-Hz electric fields indicate that levels are highly variable and source-dependent. Electric-field levels are not easily predicted because walls and other objects act as shields, because conducting objects perturb the field, and because homes contain numerous localized sources. Internal sources (wiring, fixtures, and appliances) seem to predominate in producing electric fields inside houses. Average measured electric fields in residences are generally in the range of 5 to 20 V/m. In a large occupational exposure monitoring project that included electric-field measurements at homes, average exposures for all groups away from work were generally less than 10 V/m (Bracken, 1990).

Electric fields from household appliances are localized and decrease rapidly with distance from the source. Local electric fields measured at 1 ft. (0.3 m) from small household appliances are typically in the range of 30 to 60 V/m. Stopps and Janischewskyj (1979) reported electric-field measurements near 20 different appliances; at a 1-ft. (0.3-m) distance, fields ranged from 1 to 150 V/m, with a mean of 33 V/m. In another survey, reported by Deno and Zaffanella (1982), field measurements at a 1-ft. (0.3-m) distance from common domestic and workshop sources were found to range from 3 to 70 V/m. The localized fields from appliances are not uniform, and care should be taken in comparing them with transmission-line fields.

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Electric blankets can generate higher localized electric fields. Sheppard and Eisenbud (1977) reported fields of 250 V/m at a distance of approximately 1 ft. (0.3 m). Florig et al. (1987) carried out extensive empirical and theoretical analysis of electric-field exposure from electric blankets and presented results in terms of uniform equivalent fields such as those near transmission lines. Depending on what parameter was chosen to represent intensity of exposure and the grounding status of the subject, the equivalent vertical 60-Hz electric-field exposure ranged from 20 to over 3500 V/m. The largest equivalent field corresponds to the measured field on the chest with the blanket-user grounded. The average field on the chest of an ungrounded blanket-user yields an equivalent vertical field of 960 V/m. As manufacturers have become aware of the controversy surrounding EMF exposures, electric blankets have been redesigned to reduce *magnetic* fields. However, electric fields from these “low field” blankets are still comparable with those from older designs (Bassen et al., 1991).

Generally, people in occupations not directly related to high-voltage equipment are exposed to electric fields comparable with those of residential exposures. For example, the average electric field measured in 14 commercial and retail locations in rural Wisconsin and Michigan was 4.8 V/m (ITT Research Institute, 1984). Median electric field was about 3.4 V/m. These values are about one-third the values in residences reported in the same study. Power-frequency electric fields near video display terminals (VDTs) are about 10 V/m, similar to those of other appliances (Harvey, 1983). Electric-field levels in public buildings such as shops, offices, and malls appear to be comparable with levels in residences.

In a survey of 1,882 volunteers from utilities, electric-field exposures were measured for 2,082 work days and 657 non-work days (Bracken, 1990). Electric-field exposures for occupations other than those directly related to high-voltage equipment were equivalent to those for non-work exposure.

Thus, except for the relatively few occupations where high-voltage sources are prevalent, electric fields encountered in the workplace are probably similar to those of residential exposures. Even in electric-utility occupations where high field sources are present, exposures to high fields are limited on average to minutes per day.

Electric fields found in publicly accessible areas near high-voltage transmission lines can typically range up to 3 kV/m for 230-kV lines, to 10 kV/m for 500-kV lines, and to 12 kV/m for 765-kV lines. Although these peak levels are considerably higher than the levels found in other public areas, they are present only in limited areas on rights-of-way.

The calculated electric fields for the proposed Klondike - John Day 230-kV transmission line are consistent with the levels reported for other 230-kV transmission lines in Oregon, Washington, and elsewhere. The electric fields on the right-of-way of the proposed transmission line, as calculated, would be much higher than levels normally encountered in residences and offices.

4.0 Magnetic Field

4.1 Basic Concepts

Magnetic fields can be characterized by the force they exert on a moving charge or on an electrical current. As with the electric field, the magnetic field is a vector quantity characterized by both magnitude and direction. Electrical currents generate magnetic fields. In the case of transmission lines, distribution lines, house wiring, and appliances, the 60-Hz electric current flowing in the conductors generates a time-varying, 60-Hz magnetic field in the vicinity of these sources. The strength of a magnetic field is measured in terms of magnetic lines of force per unit area, or magnetic flux density. The term “magnetic

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field,” as used here, is synonymous with magnetic flux density and is expressed in units of Gauss (G) or milligauss (mG).

The uniformity of a magnetic field depends on the nature and proximity of the source, just as the uniformity of an electric field does. Transmission-line-generated magnetic fields are quite uniform over horizontal and vertical distances of several feet near the ground. However, for small sources such as appliances, the magnetic field decreases rapidly over distances comparable with the size of the device.

The interaction of a time-varying magnetic field with conducting objects results in induced electric field and currents in the object. A changing magnetic field through an area generates a voltage around any conducting loop enclosing the area (Faraday's law). This is the physical basis for the operation of an electrical transformer. For a time-varying sinusoidal magnetic field, the magnitude of the induced voltage around the loop is proportional to the area of the loop, the frequency of the field, and the magnitude of the field. The induced voltage around the loop results in an induced electric field and current flow in the loop material. The induced current that flows in the loop depends on the conductivity of the loop.

4.2 Transmission-line Magnetic Fields

The magnetic field generated by currents on transmission-line conductors extends from the conductors through the air and into the ground. The magnitude of the field at a height of 3.28 ft. (1 m) is frequently used to describe the magnetic field under transmission lines. Because the magnetic field is not affected by non-ferrous materials, the field is not influenced by normal objects on the ground under the line. The direction of the maximum field varies with location. (The electric field, by contrast, is essentially vertical near the ground.) The most important transmission-line parameters that determine the magnetic field at 3.28 ft. (1 m) height are conductor height above ground and magnitude of the currents flowing in the conductors. As distance from the transmission-line conductors increases, the magnetic field decreases.

Calculations of magnetic fields from transmission lines are performed using well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values usually represent the ideal straight parallel-conductor configuration. For simplicity, a flat earth is usually assumed. Balanced currents (currents of the same magnitude for each phase) are also assumed. This is usually valid for transmission lines, where loads on all three phases are maintained in balance during operation. Induced image currents in the earth are usually ignored for calculations of magnetic field under or near the right-of-way. The resulting error is negligible. Only at distances greater than 300 ft. (91 m) from a line do such contributions become significant (Deno and Zaffanella, 1982). The clearance for magnetic-field calculations for the proposed line was the same as that used for electric-field evaluations.

Standard techniques for measuring magnetic fields near transmission lines are described in ANSI IEEE Standard No. 644-1994 (IEEE, 1994). Measured magnetic fields agree well with calculated values, provided the currents and line heights that go into the calculation correspond to the actual values for the line. To realize such agreement, it is necessary to get accurate current readings during field measurements (because currents on transmission lines can vary considerably over short periods of time) and also to account for all field sources in the vicinity of the measurements.

As with electric fields, the maximum or peak magnetic fields occur in areas near the centerline and at midspan where the conductors are the lowest. The magnetic field at the edge of the right-of-way is not very dependent on line height. For a double-circuit line or if more than one line is present, the peak field will depend on the relative electrical phasing of the conductors and the direction of power flow.

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4.3 Calculated Values for Magnetic Fields

Table 4 gives the calculated values of the magnetic field at 3.28 ft. (1 m) height for the proposed Klondike – John Day 230-kV double-circuit transmission line. Field values on the right-of-way and at the edge of the right-of-way are given for projected maximum currents, for minimum and average conductor clearances. The maximum currents for the Biglow Canyon circuit and Klondike circuit are given in Table 2. The maximum current on the Biglow Canyon circuit is 974 A initially and 1462 A after the Orion load is added. The maximum current on the Klondike circuit is 731 A. Power on both circuits is assumed to flow from Klondike to John Day and the phasing of the conductors is selected to be different on the lower phases to produce minimum electric and magnetic fields.

The actual magnetic-field levels would vary, as currents on the lines change daily and seasonally and as ambient temperature changes. Average currents over the year would be about 30% of the maximum values. The levels shown in the figures represent the highest magnetic fields expected for the proposed Klondike - John Day 230-kV line. Average fields over a year would be considerably reduced from the peak values, as a result of reduced average currents and increased clearances above the minimum value due to conductor temperatures less than the design value of 100 C°.

Figure 3 shows lateral profiles of the magnetic field under maximum current and minimum clearance conditions for the proposed 230-kV transmission line. A field profile for average height under maximum current conditions is also included in Figure 3.

For the proposed 230-kV line, the maximum calculated 60-Hz magnetic field expected at 3.28 ft. (1 m) above ground is 132 mG for a minimum conductor height of 26.5 ft. (8.1 m). This field is calculated for maximum currents of 974 and 731 A on the Biglow Canyon and Klondike circuits, respectively. The maximum field would decrease for increased conductor clearance. For the average conductor height over a span of 38.5 ft. (11.7 m), the maximum field would be 59 mG.

For maximum currents in both circuits and minimum clearance conditions, the calculated magnetic fields at the edges of the 125-foot (38.1-m) right-of-way are 25 mG on the edge adjacent to the Biglow Canyon circuit and 12 mG adjacent to the Klondike circuit. For average conductor height the fields at the edge of the right-of-way are 19 and 10 mG for the Biglow Canyon and Klondike sides of the line, respectively.

With the Klondike circuit out of service (0 A), the fields from the two circuits would no longer cancel. In this case the maximum field due to the Biglow Canyon circuit alone would be 150 mG at the peak location on the right-of-way and 44 mG at the edge of the right-of-way.

All of these magnetic field levels averaged over a year would be about 30-percent of the above values. Thus, averaged over the year the maximum levels at the respective edges of the right-of-way would be about 7 and 4 mG.

4.4 Environmental Magnetic Fields

Transmission lines are not the only source of magnetic fields; as with 60-Hz electric fields, 60-Hz magnetic fields are present throughout the environment of a society that relies on electricity as a principal energy source. The magnetic fields associated with the proposed Klondike - John Day 230-kV line can be compared with fields from other sources. The range of 60-Hz magnetic-field exposures in publicly accessible locations such as open spaces, transmission-line rights-of-way, streets, pedestrian walkways, parks, shopping malls, parking lots, shops, hotels, public transportation, and so on range from less than 0.1 mG to about 1 G, with the highest values occurring near small appliances with electric motors. In occupational settings in electric utilities, where high currents are present, magnetic-field exposures for

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workers can be above 1 G. At 60 Hz, the magnitude of the natural magnetic field is approximately 0.0005 mG.

Several investigations of residential fields have been conducted. In a large study to identify and quantify significant sources of 60-Hz magnetic fields in residences, measurements were made in 996 houses, randomly selected throughout the country (Zaffanella, 1993). The most common sources of residential fields were power lines, the grounding system of residences, and appliances. Field levels were characterized by both point-in-time (spot) measurements and 24-hour measurements. Spot measurements averaged over all rooms in a house exceeded 0.6 mG in 50% of the houses and 2.9 mG in 5% of houses. Power lines generally produced the largest average fields in a house over a 24-hour period. On the other hand, grounding system currents proved to be a more significant source of the highest fields in a house. Appliances were found to produce the highest local fields; however, fields fell off rapidly with increased distance. For example, the median field near microwave ovens was 36.9 mG at a distance of 10.5 in. (0.27 m) and 2.1 mG at 46 in. (1.17 m). Across the entire sample of 996 houses, higher magnetic fields were found in, among others, urban areas (vs. rural); multi-unit dwellings (vs. single-family); old houses (vs. new); and houses with grounding to a municipal water system.

In an extensive measurement project to characterize the magnetic-field exposure of the general population, over 1000 randomly selected persons in the United States wore a personal exposure meter for 24 hours and recorded their location in a simple diary (Zaffanella and Kalton, 1998). Based on the measurements of 853 persons, the estimated 24-hour average exposure for the general population is 1.24 mG and the estimated median exposure is 0.88 mG. The average field "at home, not in bed" is 1.27 mG and "at home, in bed" is 1.11 mG. Average personal exposures were found to be highest "at work" (mean of 1.79 mG and median of 1.01 mG) and lowest "at home, in bed" (mean of 1.11 mG and median of 0.49 mG). Average fields in school were also low (mean of 0.88 mG and median of 0.69 mG). Factors associated with higher exposures at home were smaller residences, duplexes and apartments, metallic rather than plastic water pipes, and nearby overhead distribution lines.

As noted above, magnetic fields from appliances are localized and decrease rapidly with distance from the source. Localized 60-Hz magnetic fields have been measured near about 100 household appliances such as ranges, refrigerators, electric drills, food mixers, and shavers (Gauger, 1985). At a distance of 1 ft. (0.3 m), the maximum magnetic field ranged from 0.3 to 270 mG, with 95% of the measurements below 100 mG. Ninety-five percent of the levels at a distance of 4.9 ft. (1.5 m) were less than 1 mG. Devices that use light-weight, high-torque motors with little magnetic shielding exhibited the largest fields. These included vacuum cleaners and small hand-held appliances and tools. Microwave ovens with large power transformers also exhibited relatively large fields. Electric blankets have been a much-studied source of magnetic-field exposure because of the length of time they are used and because of the close proximity to the body. Florig and Hoburg (1988) estimated that the average magnetic field in a person using an electric blanket was 15 mG, and that the maximum field could be 100 mG. New "low-field" blankets have magnetic fields at least 10 times lower than those from conventional blankets (Bassen et al., 1991).

In a domestic magnetic-field survey, Silva et al. (1989) measured fields near different appliances at locations typifying normal use (e.g., sitting at an electric typewriter or standing at a stove). Specific appliances with relatively large fields included can openers (n = 9), with typical fields ranging from 30 to 225 mG and a maximum value up to 2.7 G; shavers (n = 4), with typical fields from 50 to 300 mG and maximum fields up to 6.9 G; and electric drills (n = 2), with typical fields from 56 to 190 mG and maximum fields up to 1.5 G. The fields from such appliances fall off very rapidly with distance and are only present for short periods. Thus, although instantaneous magnetic-field levels close to small hand-held appliances can be quite large, they do not contribute to average area levels in residences.

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In a study with 162 subjects, Mezei et al. (2001) employed magnetic-field exposure measurements, simultaneous record-keeping of appliance proximity, and an appliance-use questionnaire to investigate the contributions of appliances to overall exposure. They found that individual appliance use did not contribute significantly to time-weighted-average exposure, unless the use was prolonged during the day of measurements. For example, approximately 16% of exposure accumulated during periods when a subject was using a computer. For all subjects exposure during computer use accounted for on-average 9% of total exposure. Cell phones were identified as another source of relatively low fields and long use times that could contribute to overall exposure. Use of other small appliances did not contribute significantly to accumulated exposure but did contribute to the relatively short periods when high-field exposures were observed.

Although studies of residential magnetic fields have not all considered the same independent parameters, the following consistent characterization of residential magnetic fields emerges from the data:

- (1) External sources play a large role in determining residential magnetic-field levels. Transmission lines, when nearby, are an important external source. Unbalanced ground currents on neutral conductors and other conductors, such as water pipes in and near a house, can represent a significant source of magnetic field. Distribution lines per se, unless they are quite close to a residence, do not appear to be a traditional distance-dependent source.
- (2) Homes with overhead electrical service appear to have higher average fields than those with underground service.
- (3) Appliances represent a localized source of magnetic fields that can be much higher than average or area fields. However, fields from appliances approach area levels at distances greater than 3.28 ft. (1 m) from the device.

Although important variables in determining residential magnetic fields have been identified, quantification and modeling of their influence on fields at specific locations is not yet possible. However, a general characterization of residential magnetic-field level is possible: average levels in the United States are in the range of 0.5 to 1.0 mG, with the average field in a small number of homes exceeding this range by as much as a factor of 10 or more. Average personal exposure levels are slightly higher, possibly due to use of appliances and varying distances to other sources. Maximum fields can be much higher.

Magnetic fields in commercial and retail locations are comparable with those in residences. As with appliances, certain equipment or machines can be a local source of higher magnetic fields. Utility workers who work close to transformers, generators, cables, transmission lines, and distribution systems clearly experience high-level fields. Other sources of fields in the workplace include motors, welding machines, computers, and video display terminals (VDTs). In publicly accessible indoor areas, such as offices and stores, field levels are generally comparable with residential levels, unless a high-current source is nearby.

Because high-current sources of magnetic field are more prevalent than high-voltage sources, occupational environments with relatively high magnetic fields encompass a more diverse set of occupations than do those with high electric fields. For example, in occupational magnetic-field measurements reported by Bowman et al. (1988), the geometric mean field from 105 measurements of magnetic field in "electrical worker" job locations was 5.0 mG. "Electrical worker" environments showed the following elevated magnetic-field levels (geometric mean greater than 20 mG): industrial power supplies, alternating current (ac) welding machines, and sputtering systems for electronic assembly. For secretaries in the same study, the geometric mean field was 3.1 mG for those using VDTs (n = 6) and 1.1 mG for those not using VDTs (n = 3).

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Measurements of personal exposure to magnetic fields were made for 1,882 volunteer utility workers for a total of 4,411 workdays (Bracken, 1990). Median workday mean exposures ranged from 0.5 mG for clerical workers without computers to 7.2 mG for substation operators. Occupations not specifically associated with transmission and distribution facilities had median workday exposures less than 1.5 mG, while those associated with such facilities had median exposures above 2.3 mG. Magnetic-field exposures measured in homes during this study were comparable with those recorded in offices.

Magnetic fields in publicly accessible outdoor areas seem to be, as expected, directly related to proximity to electric-power transmission and distribution facilities. Near such facilities, magnetic fields are generally higher than indoors (residential). Higher-voltage facilities tend to have higher fields. Typical maximum magnetic fields in publicly accessible areas near transmission facilities can range from less than a few milligauss up to 300 mG or more, near heavily loaded lines operated at 230 to 765 kV. The levels depend on the line load, conductor height, and location on the right-of-way. Because magnetic fields near high-voltage transmission lines depend on the current in the line, they can vary daily and seasonally. To characterize fields from the distribution system, Heroux (1987) measured 60-Hz magnetic fields with a mobile platform along 140 mi. (223 km) of roads in Montreal. The median field level averaged over nine different routes was 1.6 mG, with 90% of the measurements less than about 5.1 mG. Spot measurements indicated that typical fields directly above underground distribution systems were 5 to 19 mG. Beneath overhead distribution lines, typical fields were 1.5 to 5 mG on the primary side of the transformer, and 4 to 10 mG on the secondary side. Near ground-based transformers used in residential areas, fields were 80 to 1000 mG at the surface and 10 to 100 mG at a distance of 1 ft. (0.3 m).

The magnetic fields from the proposed line would be comparable to or less than those from existing 230-kV lines in Oregon, Washington, and elsewhere. On and near the right-of-way of the proposed line, magnetic fields would be above average residential levels. However, the fields from the line would decrease rapidly and approach common ambient levels (1 mG) at a distance of about 200 feet from the edge of the right-of-way under maximum current conditions and at about 100 feet from the edge under average current conditions. Furthermore, the fields at the edge of the right-of-way would not be above those encountered during normal activities near common sources such as hand-held appliances.

5.0 Electric and Magnetic Field (EMF) Effects

Possible effects associated with the interaction of EMF from transmission lines with people on and near a right-of-way fall into two categories: short-term effects that can be perceived and may represent a nuisance, and possible long-term health effects. Only short-term effects are discussed here. The issue of whether there are long-term health effects associated with transmission-line fields is controversial. In recent years, considerable research on possible biological effects of EMF has been conducted. A review of these studies and their implications for health-related effects is provided in a separate technical report for the environmental assessment for the proposed Klondike - John Day 230-kV transmission line.

5.1 Electric Fields: Short-term Effects

Short-term effects from transmission-line electric fields are associated with perception of induced currents and voltages or perception of the field. Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. These effects could occur infrequently under the proposed Klondike - John Day 230-kV line.

Steady-state currents are those that flow continuously after a person contacts an object and provides a path to ground for the induced current. The amplitude of the steady-state current depends on the induced

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current to the object in question and on the grounding path. The magnitude of the induced current to vehicles and objects under the proposed line will depend on the electric-field strength and the size and shape of the object. When an object is electrically grounded, the voltage on the object is reduced to zero, and it is not a source of current or voltage shocks. If the object is poorly grounded or not grounded at all, then it acquires some voltage relative to earth and is a possible source of current or voltage shocks.

The responses of persons to steady-state current shocks have been extensively studied, and levels of response documented (Keeseey and Letcher, 1969; IEEE, 1978). Primary shocks are those that can result in direct physiological harm. Such shocks will not be possible from induced currents under the existing or proposed lines, because clearances above ground required by the NESC preclude such shocks from large vehicles and grounding practices eliminate large stationary objects as sources of such shocks.

Secondary shocks are defined as those that could cause an involuntary and potentially harmful movement, but no direct physiological harm. Secondary shocks could occur under the proposed 230-kV line when making contact with ungrounded conducting objects such as large vehicles or equipment. However, such occurrences are anticipated to be very infrequent. Shocks, when they occur under the 230-kV line, are most likely to be below the nuisance level. Induced currents would not be perceived off the right-of-way.

Induced currents are always present in electric fields under transmission lines and will be present near the proposed line. However, during initial construction, it is BPA policy to ground metal objects, such as fences, that are located on the right-of-way. The grounding eliminates these objects as sources of induced current and voltage shocks. Multiple grounding points are used to provide redundant paths for induced current flow. After construction, BPA would respond to any complaints and install or repair grounding to mitigate nuisance shocks.

Unlike fences or buildings, mobile objects such as vehicles and farm machinery cannot be grounded permanently. Limiting the possibility of induced currents from such objects to persons is accomplished in several ways. First, required clearances for above-ground conductors tend to limit field strengths to levels that do not represent a hazard or nuisance. The NESC (IEEE, 2002) requires that, for lines with voltage exceeding 98 kV line-to-ground (170 kV line-to-line), sufficient conductor clearance be maintained to limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 milliamperes (mA) or less. This can be accomplished by limiting access or by increasing conductor clearances in areas where large vehicles could be present. BPA and other utilities design and operate lines to be in compliance with the NESC.

For the proposed line, conductor clearances (100°C) would be increased to at least 37.5 ft. (11.4 m) over major road crossings along the route, resulting in a maximum field of 1.2 kV/m or less at the 3.28 ft. (1 m) height. The largest truck allowed on roads in Oregon without a special permit is 14 ft. high by 8.5 ft. wide by 75 ft. long (4.3 x 2.6 x 22.9 m). The induced currents to such a vehicle oriented perpendicular to the line in a maximum field of 1.2 kV/m (at 3.28-ft. height) would be less than 1.2 mA (Reilly, 1979). For smaller trucks, the maximum induced currents for perpendicular orientation to the proposed line would be less than this value. (Larger special-permitted trucks, such as triple trailers, can be up to 105 feet in length. However, because they average the field over such a long distance, the maximum induced current to a 105-ft. vehicle oriented perpendicular to the 230-kV line at a road crossing would be less than that for the 75-foot truck.) These large vehicles are not anticipated to be off highways on the right-of-way or oriented parallel and directly under the proposed line. Thus, the NESC 5-mA criterion would be met for road crossings of the proposed line. In accordance with the NESC, line clearances would also be increased over other areas, such as over railroads, orchards and water areas suitable for sailboating.

The computed induced currents at road crossings are for worst-case conditions that occur rarely. Several factors tend to reduce the levels of induced current shocks from vehicles at road crossings and elsewhere:

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- (1) Activities are distributed over the whole right-of-way, and only a small percentage of time is spent in areas where the field is at or close to the maximum value.
- (2) At road crossings, vehicles are aligned perpendicular to the conductors, resulting in a substantial reduction in induced current.
- (3) The conductor clearance at road crossings may not be at minimum values because of lower conductor temperatures and/or location of the road crossing away from midspan.
- (4) The largest vehicles are permitted only on certain highways.
- (5) Off-road vehicles are in contact with soil or vegetation, which reduces shock currents substantially.

Induced voltages occur on objects, such as vehicles, in an electric field where there is an inadequate electrical ground. If the voltage is sufficiently high, then a spark discharge shock can occur as contact is made with the object. Such shocks are similar to "carpet" shocks that occur, for example, when a person touches a doorknob after walking across a carpet on a dry day. The number and severity of spark discharge shocks depend on electric-field strength and generally of concern under lines with voltages of 345-kV or higher. Nuisance shocks, which are primarily spark discharges, are not anticipated to be a problem under the proposed line.

In electric fields higher than those that would occur under the proposed line, it is theoretically possible for a spark discharge from the induced voltage on a large vehicle to ignite gasoline vapor during refueling. The probability for exactly the right conditions for ignition to occur is extremely remote. The additional clearance of conductors provided at road crossings reduces the electric field in areas where vehicles are prevalent and reduces the chances for such events. Even so, BPA recommends that vehicles should not be refueled under the proposed line unless specific precautions are taken to ground the vehicle and the fueling source (USDOE, 1995).

Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. The median field for perception in this manner was 7 kV/m for 136 persons; only about 12% could perceive fields of 2 kV/m or less (Deno and Zaffanella, 1982). In limited areas under the conductors at midspan, the fields at ground level would exceed the levels where field perception can occur. However it is unlikely that field perception would be common under the proposed 230-kV line because fields would generally be below the perception level. Where vegetation provides shielding, the field would not be perceived.

Conductive shielding reduces both the electric field and induced effects such as shocks. Persons inside a vehicle cab or canopy are shielded from the electric field. Similarly, a row of trees or a lower-voltage distribution line reduces the field on the ground in the vicinity. Metal pipes, wiring, and other conductors in a residence or building shield the interior from the transmission-line electric field.

The electric fields from the proposed 230-kV line would be comparable to or less than those from existing 230-kV lines in the project area and elsewhere. Potential impacts of electric fields can be mitigated through grounding policies and adherence to the NESC. Worst-case levels are used for safety analyses but, in practice, induced currents and voltages are reduced considerably by unintentional grounding. Shielding by conducting objects, such as vehicles and vegetation, also reduces the potential for electric-field effects.

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5.2 Magnetic Field: Short-term Effects

Magnetic fields associated with transmission and distribution systems can induce voltage and current in long conducting objects that are parallel to the transmission line. As with electric-field induction, these induced voltages and currents are a potential source of shocks. A fence, irrigation pipe, pipeline, electrical distribution line, or telephone line forms a conducting loop when it is grounded at both ends. The earth forms the other portion of the loop. The magnetic field from a transmission line can induce a current to flow in such a loop if it is oriented parallel to the line. If only one end of the fence is grounded, then an induced voltage appears across the open end of the loop. The possibility for a shock exists if a person closes the loop at the open end by contacting both the ground and the conductor. The magnitude of this potential shock depends on the following factors: the magnitude of the field; the length of the object (the longer the object, the larger the induced voltage); the orientation of the object with respect to the transmission line (parallel as opposed to perpendicular, where no induction would occur); and the amount of electrical resistance in the loop (high resistance limits the current flow).

Magnetically induced currents from power lines have been investigated for many years; calculation methods and mitigating measures are available. A comprehensive study of gas pipelines near transmission lines developed prediction methods and mitigation techniques specifically for induced voltages on pipelines (Dabkowski and Taflove, 1979; Taflove and Dabkowski, 1979). Similar techniques and procedures are available for irrigation pipes and fences. Grounding policies employed by utilities for long fences reduce the potential magnitude of induced voltage.

The magnitude of the coupling with both pipes and fences is very dependent on the electrical unbalance (unequal currents) among the three phases of the line. Thus, a distribution line where a phase outage may go unnoticed for long periods of time can represent a larger source of induced currents than a transmission line where the loads are well-balanced (Jaffa and Stewart, 1981).

Knowledge of the phenomenon, grounding practices, and the availability of mitigation measures mean that magnetic-induction effects from the proposed 230-kV transmission line would be minimal.

Magnetic fields from transmission and distribution facilities can interfere with certain electronic equipment. Magnetic fields can cause distortion of the image on older style VDTs and computer monitors (cathode-ray tubes). The threshold field for interference depends on the type and size of monitor and the frequency of the field. Interference has been observed for certain monitors at fields at or below 10 mG (Baishiki et al., 1990; Banfai et al., 2000). The problem typically arises when computer monitors are in use near electrical distribution or transmission facilities or near the distribution system in large office buildings. Under peak current conditions fields from the proposed line would fall below this level from the edge of the right of way to about 30 ft. (9 m) beyond the right of way depending on line height. For average current conditions the field at the edge of the right-of-way and beyond would be below the 10 mG level where interference can occur.

Interference from magnetic fields does not occur for flat-screen monitors, such as used in laptop computers. If interference does occur for an older monitor, it can be eliminated by shielding the affected monitor or moving it to an area with lower fields. Similar mitigation methods could be applied to other sensitive electronics, if necessary. Interference from 60-Hz fields with computers and control circuits in vehicles and other equipment is not anticipated at the field levels found under and near the proposed 230-kV transmission line.

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6.0 Regulations

Regulations that apply to transmission-line electric and magnetic fields fall into two categories. Safety standards or codes are intended to limit or eliminate electric shocks that could seriously injure or kill persons. Field limits or guidelines are intended to limit electric- and magnetic-field exposures that can cause nuisance shocks or that might cause health effects. In no case has a limit or standard been established because of a known or demonstrated health effect.

The proposed line would be designed to meet the NESC (IEEE, 2002a), which specifies how far transmission-line conductors must be from the ground and other objects. The clearances specified in the code provide safe distances that prevent harmful shocks to workers and the public. In addition, people who live and work near transmission lines must be aware of safety precautions to avoid electrical (which is not necessarily physical) contact with the conductors. For example, farmers should not up-end irrigation pipes under a transmission or other electrical line or direct the water stream from an irrigation system into or near the conductors. In addition, as a matter of safety, the NESC specifies that electric-field-induced currents from transmission lines must be below the 5 mA ("let go") threshold deemed a lower limit for primary shock. BPA publishes and distributes a brochure that describes safe practices to protect against shock hazards around power lines (USDOE, 1995).

Field limits or guidelines have been adopted in several states and countries and by national and international organizations. Electric-field limits have generally been based on minimizing nuisance shocks or field perception. In some cases, such as the state limits in Table 5, the intent of magnetic-field limits has been to limit exposures to existing levels, given the uncertainty of their potential for health effects. In the case of international standard or guideline setting organizations, magnetic field limits have been based on thresholds for possible effects from induced internal currents or electric fields (ICNIRP, 1998; IEEE, 2002b).

There are currently no national standards in the United States for 60-Hz electric and magnetic fields. Oregon's formal rule in its transmission-line-siting procedures specifically addresses field limits. The Oregon limit of 9 kV/m for electric fields is applied to areas accessible to the public (Oregon, State of, 1980). The Oregon rule also addresses grounding practices, audible noise, and radio interference. Oregon does not have a limit for magnetic fields from transmission lines.

Besides Oregon, several states have been active in establishing mandatory or suggested limits on 60-Hz electric and (in two cases) magnetic fields. Five other states have specific electric-field limits that apply to transmission lines: Florida, Minnesota, Montana, New Jersey, and New York. Florida and New York have established regulations for magnetic fields. These regulations are summarized in Table 5, adapted from TDHS Report (1989).

Government agencies and utilities operating transmission systems have established design criteria that include EMF levels. BPA has maximum allowable electric fields of 9 and 5 kV/m on and at the edge of the right-of-way, respectively (USDOE, 1996). BPA also has maximum-allowable electric-field strengths of 5 kV/m, 3.5 kV/m, and 2.5 kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively. These levels are based on limiting the maximum short-circuit currents from anticipated vehicles to less than 1 mA in shopping center lots and to less than 2 mA in commercial parking lots.

Electric-field limits for overhead power lines have also been established in other countries (Maddock, 1992). Limits for magnetic fields from overhead power lines have not been explicitly established anywhere except in Florida and New York (see Table 5). However, general guidelines and limits on EMF

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have been established for occupational and public exposure in several countries and by national and international organizations.

The American Conference of Governmental Industrial Hygienists (ACGIH) sets guidelines (Threshold Limit Values® or TLV®) for occupational exposures to environmental agents (ACGIH, 2000). In general, a TLV represents the level below which it is believed that nearly all workers may be exposed repeatedly without adverse health effects. For EMF, the TLVs represent ceiling levels. For 60-Hz electric fields, occupational exposures should not exceed the TLV of 25 kV/m. However, the ACGIH also recognizes the potential for startle reactions from spark discharges and short-circuit currents in fields greater than 5-7 kV/m, and recommends implementing grounding practices. They recommend the use of conductive clothing for work in fields exceeding 15 kV/m. The TLV for occupational exposure to 60-Hz magnetic fields is a ceiling level of 10 G (10,000 mG) (ACGIH, 2000).

Electric and magnetic fields from various sources (including automobile ignitions, appliances and, possibly, transmission lines) can interfere with implanted cardiac pacemakers. In light of this potential problem, manufacturers design devices to be immune from such interference. However, research has shown that these efforts have not been completely successful and that a few older models of pacemakers could be affected by 60-Hz fields from transmission lines. There were also numerous models of pacemakers that were not affected by fields even larger than those found under transmission lines. Because of the known potential for interference with pacemakers by 60-Hz fields, field limits for pacemaker wearers have been established by the ACGIH. They recommend that wearers of pacemakers and similar medical-assist devices limit their exposure to electric fields of 1 kV/m or less and to magnetic fields to 1 G (1,000 mG) or less (ACGIH, 2000).

The International Committee on Non-ionizing Radiation Protection (ICNIRP), working in cooperation with the World Health Organization (WHO), has developed guidelines for occupational and public exposures to EMF (ICNIRP, 1998). For occupational exposures at 60 Hz, the recommended limits to exposure are 8.3 kV/m for electric fields and 4.2 G (4,200 mG) for magnetic fields. The electric-field level can be exceeded, provided precautions are taken to prevent spark discharge and induced current shocks. For the general public, the ICNIRP guidelines recommend exposure limits of 4.2 kV/m for electric fields and 0.83 G (830 mG) for magnetic fields (ICNIRP, 1998).

ICNIRP has also established guidelines for contact currents, which could occur when a grounded person contacts an ungrounded object in an electric field. The guideline levels are 1.0 mA for occupational exposure and 0.5 mA for public exposure.

The Institute of Electrical and Electronic Engineers (IEEE, 2002b) has also set limits for occupational and public exposure to electric and magnetic fields and to contact currents. The magnetic-field limits are based on an extensive assessment of possible neurological responses to magnetic field exposures. The limit for public exposure to 60-Hz magnetic fields are 9,040 mG.

The IEEE electric-field limits are based on thresholds for possible reactions to perceivable spark discharges that occur in electric fields. The limits for public exposure to electric fields are 5 kV/m except on power line rights-of-way, where the limit is 10 kV/m. The current limit for the general public is 0.5 mA for a touch contact.

The electric fields from the proposed 230-kV transmission line would meet the ACGIH, ICNIRP, and IEEE standards, provided wearers of pacemakers and similar medical-assist devices are discouraged from unshielded right-of-way use. (A passenger in an automobile under the line would be shielded from the electric field.) The magnetic fields from the proposed line would be below the ACGIH occupational limits, and well as below those of ICNIRP and IEEE for occupational and public exposures. The electric

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fields present on the right-of-way could induce currents in ungrounded vehicles that exceeded the ICNIRP and IEEE levels of 0.5 mA.

The estimated peak electric fields on the right-of-way of the proposed transmission line would meet the limits of all states. (see Table 5). The BPA electric field criteria would be met by the proposed line. for all configurations of the proposed line. The edge-of-right-of-way electric fields from the proposed line would be below the edge-of-right-of-way limits set by all states. The magnetic field at the edge of the right-of-way from the proposed line would be below the regulatory levels of states where such regulations exist.

7.0 Audible Noise

7.1 Basic Concepts

Audible noise (AN), as defined here, represents an unwanted sound, as from a transmission line, transformer, airport, or vehicle traffic. Sound is a pressure wave caused by a sound source vibrating or displacing air. The ear converts the pressure fluctuations into auditory sensations. AN from a source is superimposed on the background or ambient noise that is present before the source is introduced.

The amplitude of a sound wave is the incremental pressure resulting from sound above atmospheric pressure. The sound-pressure level is the fundamental measure of AN; it is generally measured on a logarithmic scale with respect to a reference pressure. The sound-pressure level (SPL) in decibels (dB) is given by:

$$\text{SPL} = 20 \log (P/P_0)\text{dB}$$

where P is the effective rms (root-mean-square) sound pressure, P_0 is the reference pressure, and the logarithm (log) is to the base 10. The reference pressure for measurements concerned with hearing is usually taken as 20 micropascals (Pa), which is the approximate threshold of hearing for the human ear. A logarithmic scale is used to encompass the wide range of sound levels present in the environment. The range of human hearing is from 0 dB up to about 140 dB, a ratio of 10 million in pressure (EPA, 1978).

Logarithmic scales, such as the decibel scale, are not directly additive: to combine decibel levels, the dB values must be converted back to their respective equivalent pressure values, the total rms pressure level found, and the dB value of the total recalculated. For example, adding two sounds of equal level on the dB scale results in a 3 dB increase in sound level. Such an increase in sound pressure level of 3 dB, which corresponds to a doubling of the energy in the sound wave, is barely discernible by the human ear. It requires an increase of about 10 dB in SPL to produce a subjective doubling of sound level for humans. The upper range of hearing for humans (140 dB) corresponds to a sharply painful response (EPA, 1978).

Humans respond to sounds in the frequency range of 16 to 20,000 Hz. The human response depends on frequency, with the most sensitive range roughly between 2000 and 4000 Hz. The frequency-dependent sensitivity is reflected in various weighting scales for measuring audible noise. The A-weighted scale weights the various frequency components of a noise in approximately the same way that the human ear responds. This scale is generally used to measure and describe levels of environmental sounds such as those from vehicles or occupational sources. The A-weighted scale is also used to characterize transmission-line noise. Sound levels measured on the A-scale are expressed in units of dB(A) or dBA.

AN levels and, in particular, corona-generated audible noise (see below) vary in time. In order to account for fluctuating sound levels, statistical descriptors have been developed for environmental noise. Exceedence levels (L levels) refer to the A-weighted sound level that is exceeded for a specified

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percentage of the time. Thus, the L_5 level refers to the noise level that is exceeded only 5% of the time. L_{50} refers to the sound level exceeded 50% of the time. Sound-level measurements and predictions for transmission lines are often expressed in terms of exceedence levels, with the L_5 level representing the maximum level and the L_{50} level representing a median level.

Table 6 shows AN levels from various common sources. Clearly, there is wide variation. Noise exposure depends on how much time an individual spends in different locations. Outdoor noise generally does not contribute to indoor levels (EPA, 1974). Activities in a building or residence generally dominate interior AN levels.

The BPA transmission-line design criterion for corona-generated audible noise (L_{50} , foul weather) is 50 dBA at the edge of the ROW (USDOE, 2006). This criterion applies to new line construction and is under typical conditions of foul weather, altitude, and system voltage.

Audible noise from substations is generated predominantly by equipment such as transformers, reactors and other wire-wound equipment. It is characterized by a 120 Hz hum that is associated with magnetic-field caused vibrations in the equipment. Noise from such equipment varies by voltage and other operating conditions. The BPA design level for substation noise is 50 dBA at the substation property line for new construction (USDOE, 2006). The design level is met by obtaining equipment that meets specified noise limits and, for new substations, by securing a no-built buffer beyond the substation perimeter fence.

In industrial, business, commercial, or mixed use zones the AN level from substations may exceed 50 dBA but must still meet any state or local AN requirements. The design criteria also allows the 50 dBA design level to be exceeded in remote areas where development of noise sensitive properties is highly unlikely.

The EPA has established a guideline of 55 dBA for the annual average day-night level (L_{dn}) in outdoor areas (EPA, 1978). In computing this value, a 10 dB correction (penalty) is added to night-time noise between the hours of 10 p.m. and 7 a.m.

7.2 Transmission-line Audible Noise

Corona is the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that, under certain conditions, is accompanied by a 120-Hz hum. Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345 kV and higher during foul weather. However, the proposed 230-kV line will produce some noise under foul weather conditions.

The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, protrusions on the conductor surface—particularly water droplets on or dripping off the conductors—cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Based on meteorologic records near the route of the proposed transmission line, such conditions are expected to occur about 6% of the time during the year in the Wasco area.

For a few months after line construction, residual grease or oil on the conductors can cause water to bead up on the surface. This results in more corona sources and slightly higher levels of audible noise and

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electromagnetic interference if the line is energized. However, the new conductors "age" in a few months, and the level of corona activity decreases to the predicted equilibrium value. During fair weather, insects and dust on the conductor can also serve as sources of corona.

7.3 Predicted Audible Noise Levels

Corona-generated audible-noise levels are calculated for average voltage and average conductor heights for fair- and foul-weather conditions. The predicted levels of audible noise for the proposed line operated at a voltage of 237 kV are given in Table 7 and plotted in Figure 4.

The calculated median level (L_{50}) during foul weather at the edge of the proposed Klondike - John Day 230-kV line right-of-way (62.5 ft. from centerline) is 42 dBA; the calculated maximum level (L_5) during foul weather at the edge of the right-of-way is 45 dBA. During fair-weather conditions, which occur about 94% of the time in the Wasco area, audible noise levels at the edge of the right-of-way would be about 20 dBA (if corona were present). These lower levels could be masked by ambient noise on and off the right-of-way.

7.4 Discussion

The calculated foul-weather corona noise levels for the proposed line would be comparable to, or less than, those from existing 230-kV lines in Oregon. During fair weather, noise from the conductors might be perceivable on the right-of-way; however, beyond the right-of-way it would very likely be masked or so low as not to be perceived. During foul weather, when ambient noise is higher, it is also likely that corona-generated noise off the right-of-way would be masked to some extent.

On and off the right-of-way, the levels of audible noise from the proposed line during foul weather would be well below the 55-dBA level that can produce interference with speech outdoors. The distance to the nearest residence to the proposed line is about 0.25 miles (0.4 km). At this distance the AN from the line would be about 30 dBA during foul weather and probably not be perceived above background noise. During such periods ambient noise levels can be increased due to wind and rain hitting foliage or buildings.

The computed annual L_{dn} level for transmission lines operating in areas with about 6% foul weather is about $L_{dn} = L_{50} - 3$ dBA (Bracken, 1987). Therefore, assuming such conditions in the area of the proposed Klondike - John Day 230-kV line, the estimated L_{dn} at the edge of the right-of-way would be approximately 39 dBA, which is well below the EPA L_{dn} guideline of 55 dBA.

The transformers and other equipment installed at the new Klondike substation will be specified so that the BPA noise level criterion of 50 dBA for new substations will be met at the edge of the property (USDOE, 2006). This will ensure that all applicable federal, state, and local regulations are met.

For the expansion to the John Day Substation, the new equipment would be required to meet the same specifications as for new substations (USDOE, 2006). However, the new equipment would be placed in an environment with noise from existing transmission lines and existing equipment in the John Day Substation. The combined noise level from the existing and new facilities could exceed the 50 dBA design level at points on the perimeter of the expanded substation. However, the levels would be controlled to meet all applicable regulations at the edge of the property.

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7.5 Conclusion

Along the proposed line route there could be increases in the perceived noise above ambient levels during foul weather at the edges of the proposed 230-kV right-of-way. The corona-generated noise during foul weather would be masked to some extent by naturally occurring sounds such as wind and rain on foliage. During fair weather, the noise off the right-of-way from the proposed line would probably not be detectable above ambient levels. The noise levels from the proposed line would be below levels identified as causing interference with speech or sleep. The audible noise from the transmission line would be below EPA guideline levels and would meet the BPA design criterion that complies with state noise regulations. Similarly the new substations would be designed and constructed to meet BPA design criteria that all federal, state and local regulations be met.

8.0 Electromagnetic Interference

8.1 Basic Concepts

Corona on transmission-line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. The noise can cause radio and television interference (RI and TVI). In certain circumstances, corona-generated electromagnetic interference (EMI) can also affect communications systems and other sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345 kV or higher. This is especially true of interference with television signals. The single 1.6-in diameter conductor used in the design of the proposed 230-kV line would mitigate corona generation and keep radio and television interference levels at acceptable levels below those of many existing 230-kV lines with smaller conductors.

Spark gaps on distribution lines and on low-voltage wood-pole transmission lines are a more common source of RI/TVI than is corona from high-voltage electrical systems. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires. The proposed transmission line would be constructed with modern hardware that eliminates such problems and therefore minimizes gap noise. Consequently, this source of EMI is not anticipated for the proposed line.

No state has limits for either RI or TVI. In the United States, electromagnetic interference from power transmission systems is governed by the Federal Communications Commission (FCC) Rules and Regulations presently in existence (FCC, 1988). A power transmission system falls into the FCC category of "incidental radiation device," which is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." For purposes of these regulations, harmful interference is defined as: "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (FCC, 1988: Vol II, part 15. 47CFR, Ch. 1).

Electric power companies have been able to work quite well under the present FCC rule because harmful interference can generally be eliminated. It has been estimated that more than 95% of power-line sources that cause interference are due to gap-type discharges. These can be found and completely eliminated, when required to prevent interference (USDOE, 1980). Complaints related to corona-generated

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interference occur infrequently. This is especially true with the advent of cable television and satellite television, which are not subject to corona-generated interference. Mitigation of corona-generated interference with conventional radio and television receivers can be accomplished in several ways, such as use of a directional antenna or relocation of an existing antenna (USDOE, 1977; USDOE, 1980; Loftness et al., 1981).

8.2 Radio Interference (RI)

Radio reception in the AM broadcast band (535 to 1605 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near to transmission lines can be affected by RI. The IEEE Radio Noise Design Guide identifies an acceptable limit of fair-weather RI as expressed in decibels above 1 microvolt per meter (dB μ V/m) of about 40 dB μ V/m at 100 ft. (30 m) from the outside conductor (IEEE Committee Report, 1971). As a general rule, average levels during foul weather (when the conductors are wet) are 16 to 22 dB μ V/m higher than average fair-weather levels.

8.3 Predicted RI Levels

The predicted median (L_{50}) fair- and foul-weather RI levels at 100 ft. (30 m) from the outside conductor for the proposed line operating at 237 kV are 28 and 45 dB μ V/m, respectively. This level will meet the IEEE 40 dB μ V/m criterion for fair weather levels at distances greater than about 100 ft. (30 m) from the outside conductor. Predicted fair-weather L_{50} levels are comparable to, or lower than, those for existing 230-kV lines in Oregon..

8.4 Television Interference (TVI)

Corona-caused TVI occurs during foul weather and is generally of concern for transmission lines with voltages of 345 kV or above, and only for conventional receivers within about 600 ft. (183 m) of such a line. As is the case for RI, gap sources on distribution and low-voltage transmission lines are the principal observed sources of TVI. The use of modern hardware and construction practices for the proposed line would minimize such sources. TVI levels are expressed in dB μ V/m at 75 MHz.

8.5 Predicted TVI Levels

The foul weather TVI level predicted at 100 ft. (30 m) from the outside conductor of the proposed line is 13 dB μ V/m with the line operating at 237 kV. This is considerably below foul-weather TVI levels from existing 500-kV lines (24-27 dB μ V/m), where TVI can be a problem.

Other forms of TVI from transmission lines are signal reflection (ghosting) and signal blocking caused by the relative locations of the transmission structure and the receiving antenna with respect to the incoming television signal. The steel pole towers proposed for use in the design of the proposed line are less effective in causing this type of interference than are lattice steel towers. Television systems that operate at higher frequencies, such as satellite receivers, are not affected by corona-generated TVI. Cable television systems are similarly unaffected. The distance between the proposed line route and nearby residences makes this type of interference very unlikely for the proposed line.

Since residences are 0.25 miles or more distant, corona-generated TVI, signal reflection or signal blocking are not anticipated to occur due to the proposed 230-kV line. In the unlikely event that RI or TVI is caused by the proposed line, BPA has a program to identify, investigate, and mitigate legitimate RI and TVI complaints.

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8.6 Interference with Other Devices

Corona-generated interference can conceivably cause disruption on other communications bands such as the citizen's (CB) and mobile bands. However, mobile-radio communications are not susceptible to transmission-line interference because they are generally frequency modulated (FM). Similarly, cellular telephones operate at a frequency of 900 MHz or higher, which is above the frequency where corona-generated interference is prevalent. In the unlikely event that interference occurs with these or other communications, mitigation can be achieved with the same techniques used for television and AM radio interference. As digital signal processing has been integrated into communications the potential impact of corona-generated EMI has decreased substantially.

8.7 Conclusion

Predicted EMI levels for the proposed 230-kV transmission line are comparable to, or lower, than those that already exist near 230-kV lines and no impacts of corona-generated interference on radio, television, or other receptors are anticipated. Furthermore, if interference should occur, there are various methods for correcting it: BPA has a program to respond to legitimate complaints.

9.0 Other Corona Effects

Corona is sometimes visible as a bluish glow or as bluish plumes on higher voltage lines. On the proposed 230-kV line, corona levels would be very low, so it is very unlikely that it could be observed. Any corona on the conductors would be observable only under the darkest conditions and only with the aid of binoculars, if at all. Without a period of adaptation for the eyes and without intentional looking for the corona, it would probably not be noticeable.

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. Ozone is approximately 90% of the oxidants, while the remaining 10% is composed principally of nitrogen oxides. The corona level predicted for the proposed line is much lower than that from 500-kV lines. The levels from 500-kV lines are significantly below natural levels and fluctuations in natural levels. Consequently, any production of ozone from the proposed line would be essentially undetectable at ground level.

10.0 Summary

Electric and magnetic fields from the proposed transmission line have been characterized using well-known techniques accepted within the scientific and engineering community. The expected electric-field levels from the proposed line at minimum design clearance would be comparable to those from existing 230-kV lines in Oregon, and elsewhere. The expected magnetic-field levels from the proposed line would be comparable to those from other 230-kV lines in Oregon, and elsewhere.

The peak electric field expected under the proposed line would be 2.5 kV/m; the maximum value at the edge of the right-of-way would be about 0.3 kV/m. Clearances at road crossings would be increased to reduce the peak electric-field value to 1.2 kV/m or less.

Under maximum current conditions on both circuits, the maximum magnetic fields under the proposed line would be 132 mG; at the edge of the right-of-way of the proposed line the maximum magnetic field would be 25 mG. With only the Biglow Canyon circuit loaded to maximum current the magnetic fields

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would increase to a maximum of 150 mG on the right-of-way and 44 mG at the edge. Over a year, the magnetic field levels would average to be about 30% of the above levels.

The electric fields from the proposed line would meet regulatory limits for public exposure in Oregon and all other states that have limits and would meet the regulatory limits or guidelines for peak fields established by national and international guideline setting organizations. The magnetic fields from the proposed line would be within the regulatory limits of the two states that have established them and within guidelines for public exposure established by ICNIRP and IEEE. The state of Oregon does not have limits for magnetic fields from transmission lines.

Short-term effects from transmission-line fields are well understood and can be mitigated. Nuisance shocks arising from electric-field induced currents and voltages could be perceivable on the right-of-way of the proposed line. It is common practice to ground permanent conducting objects during and after construction to mitigate against such occurrences.

Corona-generated audible noise from the proposed line could be perceivable during foul weather at the edge of the right-of-way. The levels would be comparable with, or less than, those near existing 230-kV transmission lines in Oregon, and would be in compliance with noise regulations in Oregon, and would be below levels specified in EPA guidelines.

Corona-generated electromagnetic interference from the proposed line would be comparable to or less than that from existing 230-kV lines in Oregon. Radio interference levels would be below limits identified as acceptable. Television interference, a foul-weather phenomenon usually associated with higher voltage lines, is not anticipated to occur from the proposed 230-kV line. If legitimate TVI complaints arise, BPA has a mitigation program.

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Table 1: Alternative routes for proposed Klondike - John Day 500-kV transmission line.

Route	Description	Miles (length)
North Alternative	Runs northwest from Klondike Substation; due north from the intersection with Old Wasco-Happner Highway; then northwest along Herrin Road to the John Day Substation.	12.0
Middle Alternative	Runs northwest from the Klondike Substation; due north to Medler Road; west along Medler Road; then north and west and north again along property lines to the John Day Substation.	12.5

Table 2: Physical and electrical characteristics of the proposed Klondike - John Day double-circuit 230-kV transmission-line. See Table 1 for descriptions of alternative routes and Figure 1 for physical layout of line.

Klondike - John Day 230-kV Double-circuit	
Voltage, kV Maximum/Average¹	242/237
Peak current, A Biglow Canyon circuit² Klondike circuit	974 (1462) 731
Electric phasing (north -- south)	C A B B A C
Clearance, ft. Minimum/Average¹	26.5/38.5
Tower configuration	Vertical DC
Phase spacing, ft.³	20/32 H, 18 V
Conductor: #/diameter, in	1/1.6

¹ Average voltage and average clearance used for corona calculations.
² Maximum current will increase to 1462 A with addition of Orion project load.
³ H = horizontal feet; V = vertical feet

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Table 3: Calculated peak and edge-of-right-of-way electric fields for the proposed Klondike - John Day 230-kV line operated at maximum voltage.

Location	Electric Field, kV/m	
	Minimum	Average
Line Clearance		
Peak	2.5	1.2
Edge-of-ROW	0.3	0.2

Table 4: Calculated peak and edge-of-right-of-way magnetic fields for the proposed Klondike - John Day 230-kV line operated at maximum current. Average fields would be 30% of table values.

Location	Magnetic Field, mG	
	Minimum	Average
Line Clearance		
Peak	132	59
Edge-of-ROW ¹	25/12	19/10

¹ Higher value is at edge of right-of-way adjacent to circuit with Biglow Canyon load.

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Table 5: States with transmission-line field limits

STATE AGENCY	WITHIN RIGHT-OF-WAY	AT EDGE OF RIGHT-OF-WAY	COMMENTS
a. 60-Hz ELECTRIC-FIELD LIMIT, kV/m			
Florida Department of Environmental Regulation	8 (230 kV) 10 (500 kV)	2	Codified regulation, adopted after a public rulemaking hearing in 1989.
Minnesota Environmental Quality Board	8	—	12-kV/m limit on the high-voltage direct-current (HVDC) nominal electric field.
Montana Board of Natural Resources and Conservation	7 ¹	1 ²	Codified regulation, adopted after a public rulemaking hearing in 1984.
New Jersey Department of Environmental Protection	—	3	Used only as a guideline for evaluating complaints.
New York State Public Service Commission	11.8 (7,11) ¹	1.6	Explicitly implemented in terms of a specified right-of-way width.
Oregon Facility Siting Council	9	—	Codified regulation, adopted after a public rulemaking hearing in 1980.
b. 60-Hz MAGNETIC-FIELD LIMIT, mG			
Florida Department of Environmental Regulation	—	150 (230 kV) 200 (500 kV)	Codified regulations, adopted after a public rulemaking hearing in 1989.
New York State Public Service Commission	—	200	Adopted August 29, 1990.

¹ At road crossings

² Landowner may waive limit

Sources: TDHS Report, 1989; TDHS Report, 1990

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Table 6: Common noise levels

Sound Level, dBA	Noise Source or Effect
128	Threshold of pain
108	Rock-and-roll band
80	Truck at 50 ft.
70	Gas lawnmower at 100 ft.
60	Normal conversation indoors
50	Moderate rainfall on foliage
49	Edge of proposed 500-kV right-of-way during rain (no parallel lines)
40	Refrigerator
25	Bedroom at night
0	Hearing threshold

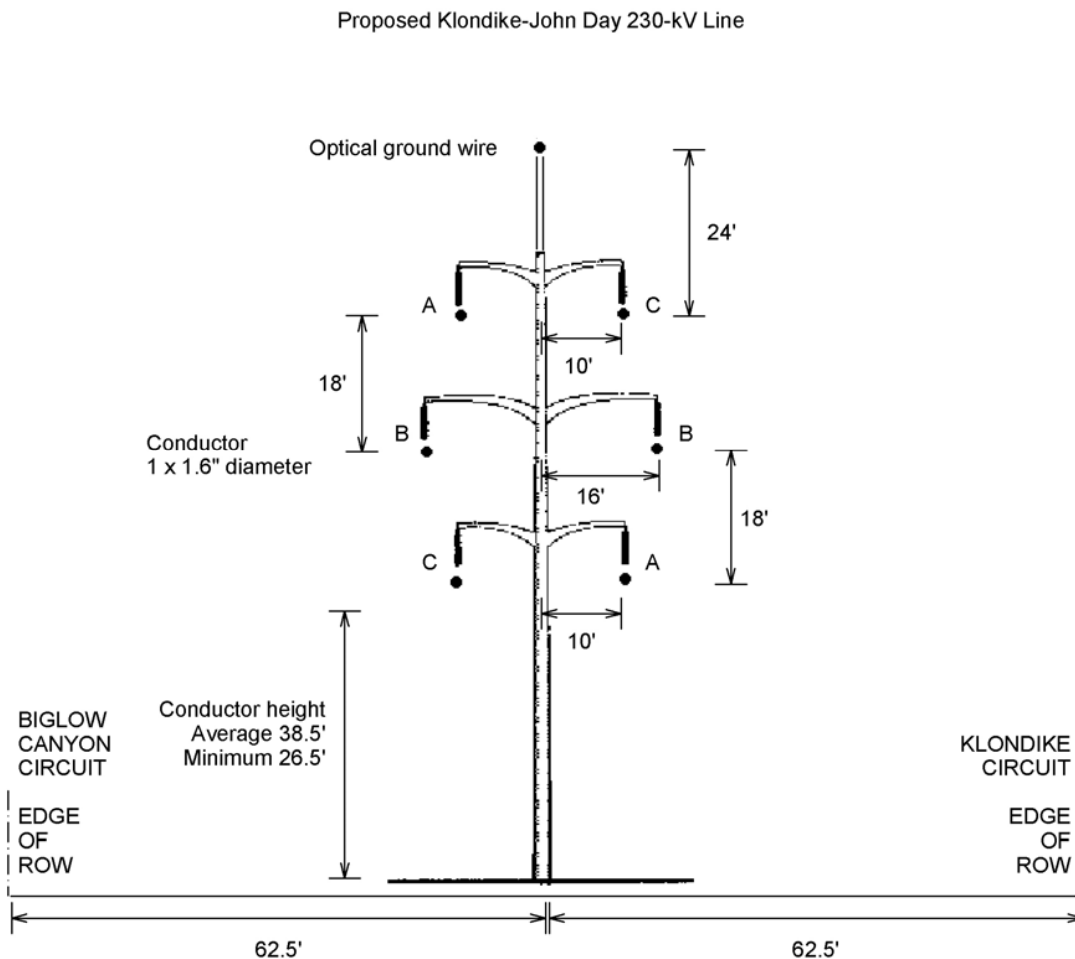
Adapted from: USDOE, 1996.

Table 7: Predicted foul-weather and fair-weather audible noise (AN) levels at edge of right-of-way (ROW) for the proposed Klondike - John Day 230-kV line. AN levels expressed in decibels on the A-weighted scale (dBA). L₅₀ and L₅ denote the levels exceeded 50 and 5 percent of the time, respectively.

Edge of Right-of-Way Audible Noise		
Descriptor	L ₅₀ , dBA	L ₅ , dBA
Foul weather	42	45
Fair weather	17	20

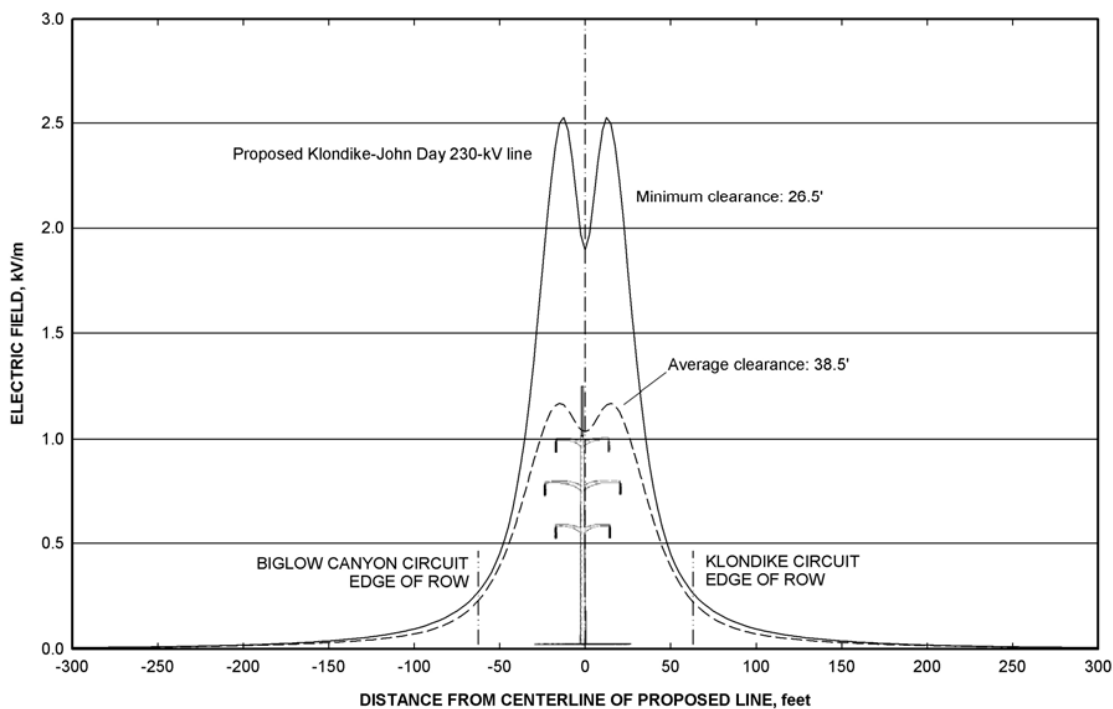
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Figure 1: Configuration for the proposed Klondike – John Day 230-kV transmission line. Routes and configuration are described in Tables 1 and 2.



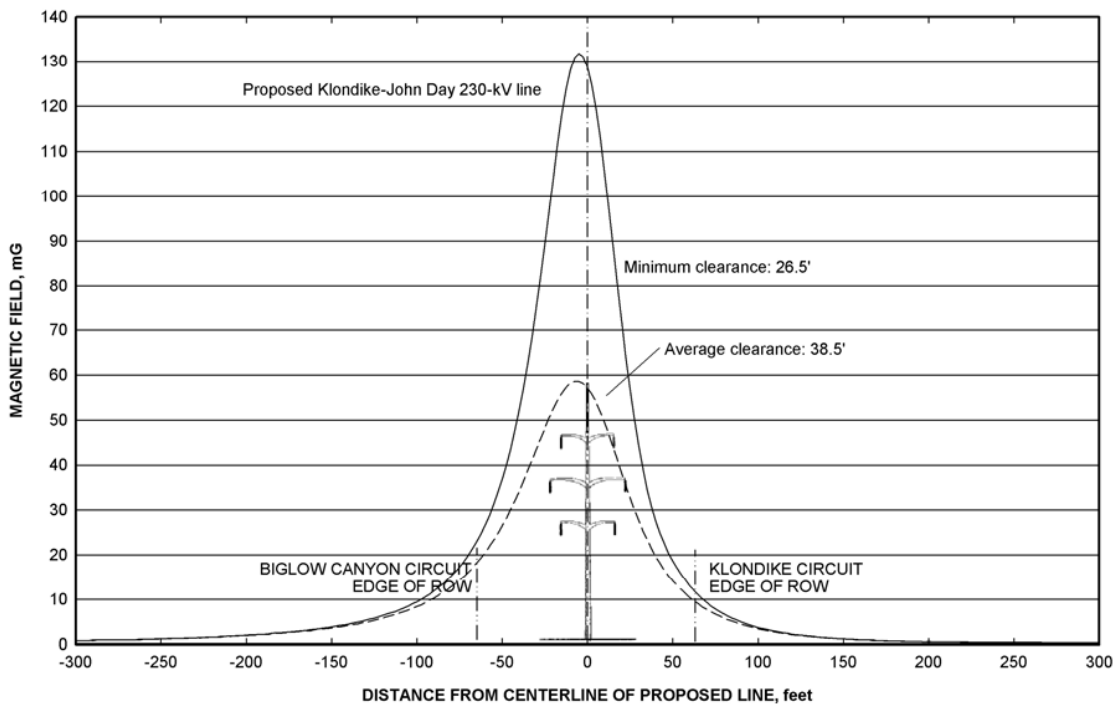
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Figure 2: Electric-field profiles for the proposed Klondike – John Day 230-kV transmission line under maximum voltage conditions. Configuration is described in Table 2.



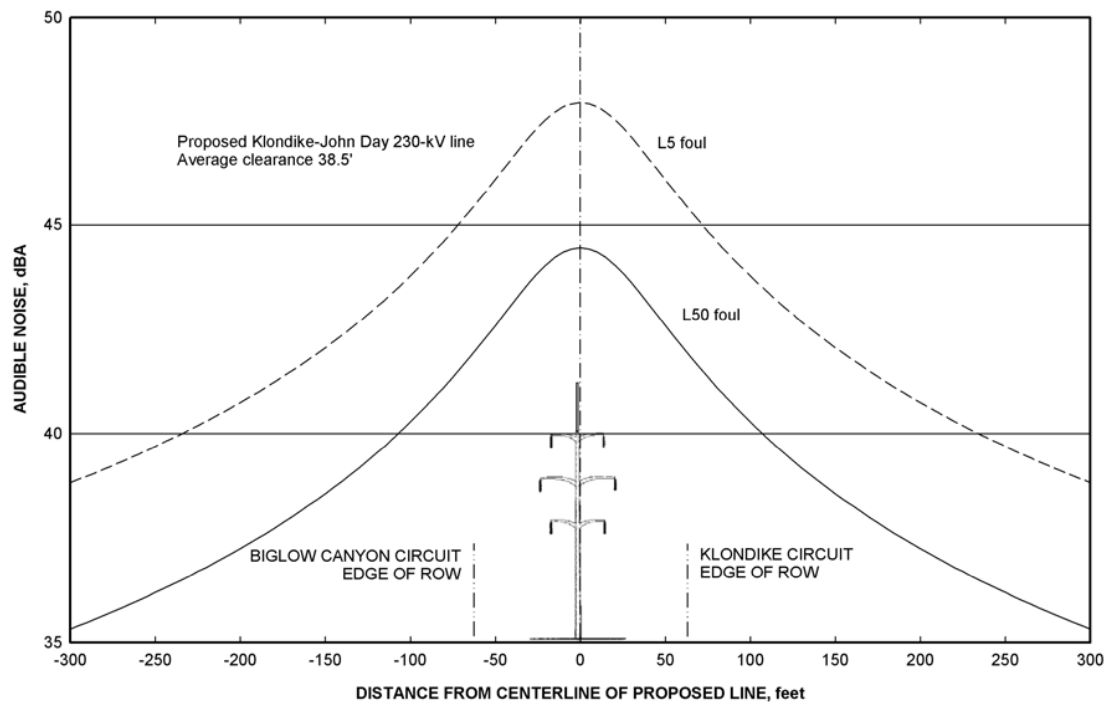
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Figure 3: Magnetic-field profiles for the proposed Klondike – John Day 230-kV transmission line under maximum current conditions. Configuration is described in Table 2.



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Figure 4: Predicted foul-weather L₅₀ audible noise levels for the proposed Klondike - John Day 230-kV transmission line. Configuration is described in Table 2.



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McNary-John Day
Transmission Project,
Draft EIS, Appendix G
(February 2002)

Appendix G

Electric and Magnetic Fields

- Assessment of Research Regarding EMF and Health and Environmental Effects
- Electrical Effects

McNARY – JOHN DAY TRANSMISSION-LINE PROJECT

***ASSESSMENT OF RESEARCH REGARDING EMF AND
HEALTH AND ENVIRONMENTAL EFFECTS***

January, 2002

Prepared by

Exponent™

and

T. Dan Bracken, Inc.

for

Bonneville Power Administration

*Bonneville Power Administration/ McNary – John Day Transmission Line Project
Assessment of Research Regarding EMF and Health and Environmental Effects*

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ASSESSMENT OF RESEARCH REGARDING EMF AND HEALTH AND ENVIRONMENTAL EFFECTS

1.0 Introduction

Over the last 20 years, research has been conducted in the United States and around the world to examine whether exposures to electric and magnetic fields (EMF) at 50/60 Hertz (Hz) from electric power lines are a cause of cancer or adversely affect human health. The research included epidemiology studies that suggested a link with childhood leukemia for some types of exposures, as well as other epidemiology studies that did not; it also included lifetime animal studies, which showed no evidence of adverse health effects. Comprehensive reviews of the research conducted by governmental and scientific agencies in the U.S. and in the United Kingdom (UK) had examined the research, and did not find a basis for imposing additional restrictions (NIEHS, 1999; IEE, 2000).

The Bonneville Power Administration (BPA) requested that Exponent update the BPA on research on EMF and health in relation to exposures that might occur near the McNary – John Day Transmission Line Project. This update concentrates on recent major research studies to explain how they contribute to the assessment of effects of EMF on health (Section 2). The focus is on both epidemiologic and laboratory research, because these research approaches provide different and complementary information for determining whether an environmental exposure can affect human health. Section 3, Ecological Research, reviews studies of potential effects of EMF on plants and animals in the natural environment. This update includes studies of residential or environmental exposures to EMF and health effects that became available in 2001 (through November).

2.0 Health

2.1 The NIEHS Report and Research Program

In 1998, the NIEHS completed a comprehensive review of the scientific research on health effects of EMF. The NIEHS had been managing a research program that Congress funded in 1992 in response to questions regarding exposure to EMF from power sources. The program was known as the RAPID Program (Research and Public Information Dissemination Program). The NIEHS convened a panel of scientists (the “Working Group”) to review and evaluate the RAPID Program research and other research. Their report, *Assessment of Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, was completed in July 1998 (NIEHS, 1998).

The director of the NIEHS prepared a health risk assessment of EMF and submitted his report to Congress in June 1999 (NIEHS, 1999). Experts at NIEHS, who had considered the previous Working Group report, reports from four technical workshops, and research that became available after June 1998, concluded as follows:

The scientific evidence suggesting that ELF-EMF [extremely low frequency-electric and magnetic field] exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed

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adults. . . . In contrast, the mechanistic studies and animal toxicology literature fail to demonstrate any consistent pattern. . . . No indication of increased leukemias in experimental animals has been observed. . . . The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiology findings. . . . The NIEHS does not believe that other cancers or other non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern (NIEHS, 1999: 9-10).

Although the results of the RAPID research are described in some detail in the 1998 report, many of the studies had not been published in the peer-reviewed literature. Recognizing the need to have these results reviewed and considered for publication, the NIEHS arranged for a special edition of the journal *Radiation Research* (*Radiation Research*, 153[5], 2000) to be devoted to this topic.¹

2.2 Update of Research Related to Cancer

This update includes studies of residential or occupational exposures to EMF and leukemia that became available through November 2001, including several epidemiology studies of childhood cancer and meta-analyses. The California Department of Health Services (CDHS) conducted a workshop in 1999 to discuss epidemiologic research on EMF and health. The reports presented at this workshop were published in January 2001 as a supplement to the journal, *Bioelectromagnetics*. Many of the papers were technical discussions of methodology issues in epidemiologic studies of EMF, including discussions of how to better understand the conflicting results reported in previous studies (Neutra and Del Pizzo, 2001). For example, one study evaluates the extent to which systematic errors (known in epidemiology as selection bias or information bias) occurred in EMF studies, and if those errors occurred, whether the effect on results could be evaluated (Wartenberg, 2001a). Other researchers discuss epidemiologic approaches to study how possible confounding factors, such as the age and type of home and traffic density, might affect the interpretation of studies of EMF and childhood cancer (Langholz, 2001; Reynolds et al., 2001).

For this update, we reviewed epidemiology and laboratory studies of cancer and reproduction. Several of the studies are “meta-analyses,” an approach that incorporates statistical methods to analyze differences among studies and aggregate the results of smaller studies. The sections below include a review of meta-analyses of the studies of childhood leukemia, and a meta-analysis of studies of breast cancer in adults (Erren, 2001).

2.2.1 Epidemiology Studies of Children

The question of power lines and childhood cancer has been based on the assumption that the relevant exposure associated with power lines is the magnetic field, rather than the electric field. This assumption rests on the fact that electric fields are shielded from the interior of homes (where people spend the vast majority of their time) by walls and vegetation, while magnetic fields are not. The magnetic field in the vicinity of a power line results from the flow of current; higher currents result in higher levels of magnetic fields.

Epidemiologic studies report results in the form of statistical associations. The term “statistical association” is used to describe the tendency of two things to be linked or to vary in the same way, such

¹ See, for instance, the articles cited in the **List of References** under Balcer-Kubiczek, Boorman, Loberg, and Ryan.

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as level of exposure and occurrence of disease. However, statistical associations are not automatically an indication of cause and effect, because the interpretation of numerical information depends on the context, including (for example) the nature of what is being studied, the source of the data, how the data were collected, and the size of the study. The larger studies and more powerful studies of EMF have not reported convincing statistical associations between power lines and childhood leukemia (e.g., Linet et al., 1997; McBride et al., 1999; UKCCS, 1999). Despite the larger sample size, these studies usually had a limited number of cases exposed over 2 or 3 milligauss (mG).

Epidemiology Studies

The following discussion briefly describes major studies.

- A study from Germany included 514 children with leukemia and 1,301 control children (Schuz et al., 2001). Measurements of magnetic-field intensity (50 Hz) were taken for 24 hours in each child's bedroom. The results were calculated separately for daytime or nighttime levels in the bedroom, rather than for a child's overall 24-hour exposure. The authors report an association with leukemia for mean daytime magnetic-field exposures that might have been due to chance. They reported an association between mean nighttime magnetic-field levels and leukemia for the highest exposed group (4 mG or higher; 9 cases). The assessment of exposure by mean field levels in the bedroom did not link magnetic-field levels to any specific source. The authors note in their conclusions that “. . . fewer than one-third of all stronger magnetic fields were caused by high-voltage powerlines” (Schuz et al., 2001:734).

Several aspects of the study detract from the validity of the results: the estimate included a broad margin of error because only a small number of cases was exposed at the higher levels, and many eligible cases and controls did not participate, which means that the responders may not represent the population and results could be biased. Another concern is that these magnetic-field measurements were taken in 1997, long after the relevant exposure period for cases diagnosed in 1990-1994. Magnetic-field levels may have changed over time, as electricity usage changed.

- A study from British Columbia, Canada, included 462 children who had been diagnosed with leukemia and an equal number of children without leukemia for comparison (McBride et al., 1999). Magnetic-field exposure was assessed for each of the children in several ways: personal monitors were worn in a backpack for 48 hours, a monitor took measurements in the bedroom for 24 hours, the wiring outside the house was rated by potential exposure level (wire codes), and measurements were taken around the outside perimeter of the homes. (Wire codes are a method of estimating relative exposure intensity based on the configuration of the power lines.) Regardless of the method used to estimate magnetic-field exposure, the magnetic-field exposure of children who had leukemia was not greater than that of the children in the comparison group.
- A study conducted in Ontario, Canada reported on the magnetic-field exposure of a smaller group of children than in other recent studies (Green et al., 1999a). No increased risk estimates were found with the average magnetic fields in the bedroom or the interior, or with any of the three methods of estimating exposure from wire-configuration codes. A still smaller group of 88 children with leukemia and their controls wore personal monitors to measure magnetic fields (Green et al., 1999b). Associations with magnetic fields were reported in some of the analyses, but most of the risk estimates had a broad margin of error, and major methodological problems in the study preclude any clear interpretation of the findings.
- The United Kingdom Childhood Cancer Study, the largest study to date, included a total of 1073 childhood leukemia cases (UKCCS, 1999). Exposure was assessed by spot measurements in the

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home (bedroom and family room) and school, and summarized by averaging these over time. No evidence was found to support the idea of an increased risk of leukemia from exposures to magnetic fields inside or outside of the home.

- The UKCCS investigators had obtained magnetic-field measurements on only a portion of the childhood cancer cases in their study (UKCCS, 1999). To obtain additional information, they used a method to assess exposure to magnetic fields without entering homes; they were thus able to analyze 1331 child leukemia cases (UKCCS, 2000). For these children, they measured distances to power lines and substations. This information was used to calculate the magnetic field from these external field sources, based on power-line characteristics related to production of magnetic fields. The results of the second UKCCS study showed no evidence for an association with leukemia for magnetic fields calculated to be between 1 mG and 2 mG, 2 mG and 4 mG, or 4 mG or greater at the residence, in contrast to the weak association reported for measured fields of 4 mG or greater in the first report (UKCCS, 1999).

Researchers have proposed that the associations that are sometimes reported between childhood leukemia and power lines might be due to other factors that can confound (other risk factors for disease that may distort the analysis) the analysis. One example is heavy traffic, which may occur near power lines and which can increase the levels of potentially carcinogenic chemicals in the area. Earlier studies had reported associations between traffic density and childhood cancer (Savitz et al., 1988). If power lines were more common in areas that had higher traffic density, then the increased air pollution might explain an association between power lines and childhood cancer. However, more recent studies seem to eliminate this possibility. In a study of 90 cases of childhood leukemia, Reynolds et al. (2001) found no evidence of an association with traffic density. In a larger study that included 986 cases of childhood leukemia, no association was found with high traffic-density exposure during pregnancy or childhood (Raaschou-Nielsen et al., 2001).

Meta-analyses of Studies of Leukemia

Recently, researchers re-analyzed the data from previous epidemiology studies of magnetic fields and childhood leukemia (Ahlbom et al., 2000; Greenland et al., 2000). The researchers pooled the data on individuals from each of the studies, creating a study with a larger number of subjects and therefore greater statistical power than any single study. A pooled analysis is preferable to other types of meta-analyses in which the results from several studies are combined from grouped data obtained from the published studies. These analyses focused on studies that assessed exposure to magnetic fields using 24-hour measurements or calculations based on the characteristics of the power lines and current load. Both Ahlbom et al. and Greenland et al. used exposure categories of <1 mG (<0.1 microtesla [μ T]) as a reference category. The statistical results of these analyses can be summarized as follows:

- The pooled analyses provided no indication that wire codes are more strongly associated with leukemia than measured fields.
- Pooling these data corroborates an absence of an association between childhood leukemia and magnetic fields for exposures below 3 mG (0.3 μ T).
- Pooling these data results in a statistical association with leukemia for exposures greater than 3-4 mG (0.3 or 0.4 μ T).

The authors are appropriately cautious in the interpretation of their analyses, and they clearly identify the limitations in their evaluation of the original studies. Magnetic fields above 3 mG (0.3 μ T) in residences are estimated to be rather rare, about 3% in the U.S. (Zaffanella, 1993). Limitations include sparse data

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(few cases) to adequately characterize a relationship between magnetic fields and leukemia, uncertainties related to pooling different magnetic-field measures without evidence that all of the measures are comparable, and the incomplete and limited data on important confounders such as housing type and traffic density.

A meta-analysis of the data from epidemiologic studies of childhood leukemia studies was presented at the California Workshop and recently published (Wartenberg, 2001b). This meta-analysis did not have the advantage of obtaining and pooling the data on all of the individuals in the studies, unlike those published before it (Ahlbom et al., 2000; Greenland et al., 2000). Instead of using individual data, Wartenberg (2001b) used an approach that extracted the published results, reported as grouped data from several published studies. He used 19 studies overall, after excluding 7 studies that had insufficient data on individuals or deficiencies in the exposure assessment data. He reported a weak association for a) “proximity to electrical facilities” based on wire codes or distance, and b) magnetic-field level over 2 mG, based on either calculations from wiring and loading characteristics (if available) or on spot magnetic-field measurements. The results show more cases than controls exposed to measured or calculated fields above 2 mG. The author concludes that the analysis supports an association, although the size of the effect is small to moderate, but also notes “limitations due to design, confounding, and other biases may suggest alternative interpretations” (Wartenberg, 2001b:S-100).

The results of this meta-analysis are not directly comparable to previous ones regarding fields of 3 or 4 mG because the analysis was not based on individual data. The comparison of grouped data used different exposure cut points for the analysis and different criteria for the comparison group. None of these three analyses (Ahlbom et al., 2000; Greenland et al., 2000; Wartenberg, 2001b) included the results of the latest UK analysis of 1331 child leukemia cases based on calculated fields, which found no association between EMF and childhood leukemia or other cancers, regardless of the exposure level.

2.2.2 Epidemiology Studies of Adults

Studies of adults with certain types of cancer, such as brain cancer, breast cancer, or leukemia, have reported associations with exposure to magnetic fields at residences, but results have not been consistent across studies. Contradictory results among studies argue against a conclusion that the association reflects a cause-and-effect relationship. In their assessments of risk, scientists give most weight to studies that include more people, obtain more detailed and individual exposure assessments, and/or include people who have higher exposures.

A study of 492 adult cases of brain cancer in California included measurements of magnetic fields taken in the home and at the front door, and considered the types of power-line wiring (Wrensch et al., 1999). The authors report no evidence of increased risk with higher exposures, no association with type of power line, and no link with levels measured at the front door.

A number of recent studies of breast cancer focused on electric blankets as a source of high exposure. Electric blankets are assumed to be one of the strongest sources of EMF exposure in the home. Three studies of electric-blanket use found no evidence that long-term use increased the risk of breast cancer. Women who developed breast cancer reported no difference in total use of electric blankets, use in recent years, or use many years in the past:

- Gammon et al. (1998) reported that, even for those who kept the blanket on most of the time, no increase in risk was found for those who had longer duration of use (measured in months).

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- A study of 608 breast cancer cases found no evidence of increased use of electric blankets or other home appliances in cases compared to controls, and no indication of increasing risk with a longer time of use (Zheng et al., 2000).
- In a cohort of over 120,000 female nurses, data were obtained on known risk factors for breast cancer as well as electric-blanket use (Laden et al., 2000). For a large subset of this group, the questions about exposure were asked before the disease occurred, a step taken to eliminate bias in recalling exposure. No associations with electric blanket use were found.

Erren (2001) reported the results of a meta-analysis of the studies of breast cancer, in which the results of 24 different studies in women were statistically aggregated. When the results of all 24 studies, including studies of workplace exposures, were pooled, the estimate indicated an association between EMF and a small excess breast cancer risk. The pooled results for exposure to EMF in the vicinity of electrical facilities did not show an association with breast cancer, nor did the results for exposure to EMF from appliance use. However, the meta-analysis also showed a lack of consistency among the results of the individual studies, a broad variation in the designs, and a wide range of methods used to assess exposure. No adjustments were made to the data to give increased weight to studies based on more comprehensive exposure assessments. The author also noted that the weak statistical association might be an artifact (a result of chance or unforeseen error) rather than an indication of a cause-and-effect relationship (Erren, 2001).

2.2.3 Laboratory Studies of EMF

Laboratory studies complement epidemiologic studies of people because the effects of heredity, diet, and other health-related exposures of animals can be better controlled or eliminated. The assessment of EMF and health, as for any other exposure, includes chronic, long-term studies in animals (*in vivo* studies) and studies of changes in genes or other cellular processes observed in isolated cells and tissues in the laboratory (*in vitro*).

Although the results of the RAPID Program were described in some detail in the NIEHS reports (NIEHS, 1998), many of the studies had not been published in the peer-reviewed literature. The RAPID research program included studies of four biological effects, each of which had previously been observed in only one laboratory. These effects are as follows: effects on gene expression, increased intracellular calcium in a human cell line, proliferation of cell colonies on agar, and increased activity of the enzyme ornithine decarboxylase (ODC). Some scientists have suggested that these biological responses are signs of possible adverse health effects of EMF. It is standard scientific procedure to attempt to replicate results in other laboratories, because artifacts and investigator error can occur in scientific investigations. Replications, often using more experiments or more rigorous protocols, help to ensure objectivity and validity. Attempts at replication can substantiate and strengthen an observation, or they may discover the underlying reason for the observed response.

Studies in the RAPID program reported no consistent biological effects of EMF exposure on gene expression, intracellular calcium concentration, growth of cell colonies on agar, or ODC activity (Boorman et al., 2000b). For example, Balcer-Kubiczek et al. (2000) and Loberg et al. (2000) studied the expression of hundreds of cancer-related genes in human mammary or leukemia cell lines. They found no increase in gene expression with increased intensity of magnetic fields. To test the experimental procedure, they used X-rays and treatments known to affect the genes. These are known as positive controls and, as expected, caused gene expression in exposed cells.

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Scientists have concluded that the combined animal bioassay results provide no evidence that magnetic fields cause, enhance, or promote the development of leukemia and lymphoma, or mammary cancer (e.g., Boorman et al., 1999; McCormick et al., 1999; Boorman et al., 2000 a, b; Anderson et al., 2001).

2.2.4 Summary Regarding Cancer

Epidemiology studies do not support the idea that EMF from power lines increase the risk of cancers in adults. The latest epidemiologic studies of childhood cancer, considered in the context of the other data, provide no persuasive evidence that leukemia in children is causally associated with magnetic fields measured at the home, calculated magnetic fields based on distance and current loading, or wire codes. Recent meta-analyses reported no association between childhood cancer and magnetic fields below 2 or 3 mG. Although some association was reported for fields above this level, fields at most residences are likely to be below 3 or 4 mG. The authors of each of these analyses list several biases and problems that render the data inconclusive and prevent resolution of the inconsistencies in the epidemiologic data. For this reason, laboratory studies can provide important complementary information. Large, well-conducted animal studies and studies of initiation and promotion, provide no basis to conclude that EMF increases leukemia, lymphoma, breast, brain, or any other type of cancer.

2.3 Research Related to Reproduction

Previous epidemiologic studies reported no association with birth weight or fetal growth retardation after exposure to sources of relatively strong magnetic fields, such as electric blankets, or sources of typically weaker magnetic fields such as power lines (Bracken et al., 1995; Belanger et al., 1998).

A recent epidemiology study examined miscarriages² in relation to exposures to magnetic fields from electric bed-heating (electric blankets, heated waterbeds and mattress pads), which result in higher exposures than residential fields in general (Lee et al., 2000). The researchers assessed exposure prior to the birth (a prospective study) and included information to control for potential confounding factors (other exposures and conditions that affect the risk of miscarriage). This study had a large number of cases and high participation rates. Miscarriage rates were lower among users of electric bed-heating.

Studies of laboratory animals exposed to pure 60-Hz fields have shown no increase in birth defects, no multigenerational effects, and no changes that would indicate an increase in miscarriage or loss of fertility (e.g., Ryan et al., 1999; Ryan et al., 2000). Exposed and unexposed litters were no different in the amount of fetal loss and the number and type of birth defects, indicating no reproductive effect of EMF.

In summary, the recent evidence from epidemiology and laboratory studies provides no indication that exposure to power-frequency EMF has an adverse effect on reproduction, pregnancy, or growth and development of the embryo. The results of these recent studies are consistent with the conclusions of the NIEHS.

2.4 Power-line Electric Fields and Airborne Particles and Ions

Researchers from a university in England have suggested that the alternating-current (ac) electric fields from power lines might affect health indirectly, by interacting with the electrical charges on certain airborne particles in the air. They hypothesize that more particles would be deposited on the skin by a strong electric field, or in the lung by charges on particles (Henshaw et al., 1996; Fewes et al., 1999a, b).

² The medical term for miscarriage is spontaneous abortion.

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If this hypothesis were correct, and interaction did occur (i.e., the airborne particles were charged to increase deposition on skin and in lungs to a sufficient degree), then the researchers further hypothesize that human exposure to various airborne particles and disease might increase. These hypotheses remain highly speculative; scientists have found their assumptions unconvincing, and recognize data gaps in the steps of the hypotheses. Nevertheless, questions about effects of these charged particles have been raised in the media.

In their laboratory, Henshaw and colleagues have developed models to test the physical assumptions that are the first step of their hypotheses: that electric fields can change the behavior of particulates in the air. For example, they measured the deposition of radon daughter³ particles on metal plates, in the presence of electric fields at intensities found under or near power lines. They also reported increased deposition at similar electric field strengths outdoors near high voltage transmission lines. Under these conditions, deposition of products on surfaces was slightly increased, an occurrence that implies that the deposition might also occur on other surfaces, such as the skin. However, Henshaw and colleagues have not tested the most speculative parts of their hypothesis: that such changes in the deposition rate of particles would lead to an important increase in human exposure, and also that the increased skin exposure would be sufficient to affect human health, in this case to cause an increase in skin cancer. Given (a) the small change anticipated, (b) the ability of wind to disperse particles, and (c) the limited amount of time that people spend outdoors directly under high-voltage power lines, the assumption of health effects is unsupported (Swanson and Jeffers, 2000).

Henshaw et al. also hypothesize that ac electric fields at the surface of power line conductors lead to increased charges on particles, and thereby increase the likelihood that inhaled particles, including radon daughters, would be deposited on surfaces inside the lung or airways, even at considerable distances from the line. Air contains particles of various sizes, including aerosols⁴ from emissions from cars and trucks and manufacturing, as well as natural sources such as radon from soil, rock, and building materials. If, as hypothesized, charges on the aerosol particles were increased, and if this change were to increase deposition in the lungs when inhaled over long periods of time, in theory these events could lead to increases in respiratory disease, and possibly other diseases.

The physical basis for aspects of these hypotheses is reasonable. However, the other steps of the hypothesis are highly speculative, and the idea that power lines could substantially affect human exposure to airborne particles or lead to adverse health effects is unwarranted (Swanson and Jeffers, 2000).

The National Radiological Protection Board (NRPB) of Great Britain considered the hypotheses and data published by Fewes et al. regarding aerosol deposition increased by electric fields (1999a) and exposure to corona ions from power lines (1999b). The NRPB report (2001) concluded:

The physical principles for enhanced aerosol deposition in large electric fields are well understood. However, it has not been demonstrated that any such enhanced deposition will increase human exposure in a way that will result in adverse health effects to the general public (NRPB, 2001: 23).

2.5 Recent Reviews by Scientific Advisory Groups

Reviews of the scientific research regarding EMF and health by the Health Council of the Netherlands (HCN) were published in 2000 and updated in May 2001. The Institute of Electrical Engineers of Great

³ Radon daughters refers to the radioactive decay products of radon (²²²Rn).

⁴ An aerosol is a relatively stable suspension of solid particles or liquid droplets in a gaseous medium.

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Britain (IEE) published a review in 2000. The NRPB Advisory Group on Non-Ionising Radiation (AGNIR) published the most recent review in 2001. That review includes research published in 2000, and includes the most comprehensive discussion of the individual research studies. The International Agency for Research on Cancer (IARC) evaluated health effects of EMF and released a statement regarding their findings in June 2001.

2.5.1 National Radiological Protection Board of Great Britain (NRPB) Advisory Group on Non-Ionising Radiation

The conclusions from the report prepared by the NRPB's Advisory Group on Non-Ionising Radiation (AGNIR) on ELF-EMF and the risk of cancer are consistent with previous reviews. Members from universities, medical schools, and cancer research institutes reviewed the reports of experimental and epidemiological studies, including reports in the literature in 2000. Their general conclusions are as follows:

Laboratory experiments have provided no good evidence that extremely low frequency electromagnetic fields are capable of producing cancer, nor do human epidemiological studies suggest that they cause cancer in general. There is, however, some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukaemia in children. In practice, such levels of exposure are seldom encountered by the general public in the UK [or in the U.S.] (NRPB, 2001: 164).

The group further recognizes that the scientific evidence suggesting that exposure to power-frequency electromagnetic fields poses an increased risk of cancer is very weak. Virtually all of the cellular, animal and human laboratory evidence provides no support for an increased risk of cancer incidence following such exposure to power frequencies, although sporadic positive findings have been reported. In addition, the epidemiological evidence is, at best, weak.

These conclusions of the Advisory Group are consistent with previous reviews by the NIEHS (1999) and the Health Council of the Netherlands (HCN, 2000). The NRPB response to the Advisory Group report states that "the review of experimental studies by [the Advisory Group] AGNIR gives no clear support for a causal relationship between exposure to ELF-EMFs and cancer" (NRPB, 2001: 1).

2.5.2 Health Council of the Netherlands (HCN)

The Health Council of the Netherlands has prepared updates of its 1992 Advisory Report on exposure to electromagnetic fields (0 Hz to 10 MHz) (HCN, 2000; 2001). Members of the Expert Committee who prepared the report include specialists in physics, biology, and epidemiology. The Expert Committee based its analysis on the review and summaries of the studies provided in the NIEHS (1998) and concurred with the views of the director of the NIEHS (1999). For the update, the Committee evaluated a number of publications that appeared after these reports, e.g., McBride et al., (1999) and Green et al. (1999a), and wrote:

The committee thinks that the quality of the relevant epidemiological research has improved considerably since the publication of the advisory report in 1992. Even so, this research has not resulted in unequivocal, scientifically reliable conclusions (HCN, 2000: 15).

The Council emphasizes that the associations with EMF reported in epidemiologic studies are strictly statistical and do not demonstrate a cause-and-effect relationship. In their view, experimental research

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does not demonstrate a causal link or a mechanism to explain EMF as a cause of disease in humans. They concluded that there is no reason to recommend measures to limit residence near overhead power lines (HCN, 2000).

The 2001 update (HCN, 2001) includes three major studies (described above) published in 2000 and 2001 (Ahlbom et al., 2000; Greenland et al., 2000; Wartenberg 2001b). The Council concludes:

Because the association is only weak and without a reasonable biological explanation, it is not unlikely that [an association between ELF exposure and childhood leukemia] could also be explained by chance The committee therefore sees no reason to modify its earlier conclusion that the association is not likely to be indicative of a causal relationship (HCN, 2001: 40).

2.5.3 Institution of Electrical Engineers (IEE) of Great Britain

One of the recent reviews was that of the Institution of Electrical Engineers (IEE) of Great Britain (IEE, 2000). In 1992, the IEE set up a Working Party whose eight members, with broad expertise in the health sciences, review the relevant scientific literature and prepare reports of their views. Their conclusion is based on recent major epidemiologic studies and the scientific literature built up over the past 20 years. In May 2000, the Working Party concluded “. . . that there is still not convincing scientific evidence showing harmful effects of low level electromagnetic fields on humans” (IEE, 2000:1).

2.5.4 International Agency for Research on Cancer (IARC)

The International Agency for Research on Cancer sponsored a review of EMF research by a Working Group of scientific experts from 10 countries. This multidisciplinary group reviewed health effects of ELF-EMF. Although their monograph is still in preparation, IARC has released a summary of the Group's conclusions. The Working Group concluded that the epidemiologic studies do not provide support for an association between childhood leukemia and residential magnetic fields at intensities less than 4 mG. IARC reviewers also evaluated the animal data and concluded that it was “inadequate” to support a risk for cancer. Their summary states that the EMF data does not merit the category “carcinogenic to humans” or the category “probably carcinogenic to humans,” nor did they find that “the agent is probably not carcinogenic to humans” (IARC, 2001).

2.6 Summary

The results of the latest epidemiologic studies of childhood cancer do not provide convincing evidence to support the hypothesis that exposure to magnetic fields or power lines near the home are a cause of leukemia in children. The larger, more reliable, residential studies do not support the idea that fields in the residence contribute to the risk of cancer in adults. Although epidemiology studies provide evidence most relevant to humans, the results may include uncertainties because they are observational rather than experimental. For this reason, laboratory studies can provide important complementary information. The larger and more thorough animal studies that exposed animals for EMF for their entire lifespan show no increases in cancer or other adverse health effects, including reproduction outcomes, in exposed animals.

3.0 Ecological Research

Scientists have studied the effects of high-voltage transmission lines on many plant and animal species in the natural environment. In this section, the research on the effects of EMF on ecological systems to assess the likelihood of adverse impacts was briefly reviewed. In addition to the comprehensive review

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of research on this topic by wildlife biologists at BPA (Lee et al., 1996), a search of the published scientific literature for more recent studies published between 1995 and June 2001 was conducted.

3.1 Fauna

The habitat on the transmission-line right-of-way and surrounding area shields most wildlife from electric fields. Vegetation in the form of grasses, shrubs, and small trees largely shields small ground-dwelling species such as mice, rabbits, foxes, and snakes from electric fields. Species that live underground, such as moles, woodchucks, and worms, are further shielded from electric fields by the soil. Hence, large species such as deer and domestic livestock (e.g., sheep and cattle) have greater potential exposures to electric fields since they can stand taller than surrounding vegetation. However, the duration of exposure for deer and other large animals is likely to be limited to foraging bouts or the time it takes them to cross under the line. Furthermore, all species would be exposed to higher magnetic fields under a transmission line than elsewhere, as the vegetation and soil do not provide shielding from this aspect of the transmission-line electrical environment.

Field studies have been performed in which the behavior of large mammals in the vicinity of high-voltage transmission lines was monitored. No effects of electric or magnetic fields were evident in two studies from the northern United States on big game species, such as deer and elk, exposed to a 500-kilovolt (kV) transmission line (Goodwin 1975; Picton et al., 1985). In such studies, a possible confounding factor is audible noise. Audible noise associated with high-voltage power transmission lines (with voltages greater than 110-kV) is due to corona. Audible noise generated by transmission lines reaches its highest levels in inclement weather (rain or snow).

Much larger populations of animals that might spend time near a transmission line are livestock that graze under or near transmission lines. To provide a more sensitive and reliable test for adverse effects than informal observation, scientists have studied animals continuously exposed to fields from the lines in relatively controlled conditions. For example, grazing animals such as cows and sheep have been exposed to high-voltage transmission lines and their reproductive performance examined (Lee et al., 1996). No adverse effects were found among cattle exposed over one or more successive breedings to a 500-kV direct-current overhead transmission line (Angell et al., 1990). Compared to unexposed animals in a similar environment, the exposure to 50-Hz fields did not affect reproductive functions or pregnancy of cows (Algers and Hennichs, 1985; Algers and Hultgren, 1987).

A group of investigators from Oregon State University, Portland State University, and other academic centers evaluated the effects of long-term exposure to EMF from a 500-kV transmission line operated by BPA on various cellular aspects of immune response, including the production of proteins by leukocytes (IL-1 and IL-2) of sheep. In previous unpublished reports, the researchers found differences in IL-1 activity between exposed and control groups. However, in their most recent replication, the authors found no evidence of differences in these measures of immune function. The sheep were exposed to 27 months of continuous exposure to EMF, a period of exposure much greater than the short, intermittent exposures that sheep would incur grazing under transmission lines. Mean exposures of EMF were 3.5-3.8 μ T (35-38 mG) and 5.2-5.8 kV/m, respectively (Hefeneider et al., 2001).

Scientists from the Illinois Institute of Technology (IIT) monitored the possible effects of electric and magnetic fields on fauna and flora in Michigan and Wisconsin from 1969 – 1997 to evaluate the effects of an above-ground, military-communications antenna operating at 76 Hz. The antenna produces EMF similar in physical characteristics to those produced by high-voltage transmission lines, but of much lower intensity. This study, which included embryonic development, fertility, postnatal growth, maturation, aerobic metabolism, and homing behavior, showed no adverse impacts of ELF electric and magnetic fields on the animals (NRC, 1997).

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The hormone melatonin, secreted at night by the pineal gland, plays a role in animals that are seasonal breeders. Studies in laboratory mice and rats have suggested that exposure to electric and/or magnetic fields might affect levels of the hormone melatonin, but results have not been consistent (Wilson et al., 1981; Holmberg, 1995; Kroeker et al., 1996; Vollrath et al., 1997; Huuskonen et al., 2001). However, when researchers examined sheep and cattle exposed to EMF from transmission lines exceeding 500-kV, they found no effect on the levels of the hormone melatonin in blood, weight gain, onset of puberty, or behavior in sheep and cattle (Stormshak et al., 1992; Lee et al., 1993; Lee et al., 1995; Thompson et al., 1995; Burchard et al., 1998).

Another part of the IIT study examined the effect of the antenna system fields on the growth, development, and homing behavior of birds. Studies of embryonic development (Beaver et al., 1993), fertility, postnatal growth, maturation, aerobic metabolism, and homing behavior showed no adverse impacts of ELF electric and magnetic fields on the animals (NRC, 1997). Fernie and colleagues studied the effects of continuous EMF exposure of raptors to an electric field of 10 kV/m in a controlled, laboratory setting. The exposure was designed to mimic exposure to a 765-kV transmission line. Continuous EMF exposure was found to reduce hatching success and increase egg size, fledging success, and embryonic development (Fernie et al., 2000). In a study of the effects on body mass and food intake of reproducing falcons, the authors found that EMF lengthened the photoperiod as a result of altered melatonin levels in the male species, yet concluded that “EMF effects on adult birds may only occur after continuous, extended exposure,” which is not likely to occur from resting on power lines (Fernie and Bird, 1999:620).

Several avian species are reported to use the earth’s magnetic field as one of the cues for navigation. It has been proposed that deposits of magnetite in specialized cells in the head are the mechanism by which the birds can detect variations in the inclination and intensity of a direct-current (dc) magnetic field (Kirschvink and Gould, 1981; Walcott et al., 1988). In early studies of transmission lines, it was reported that the migratory patterns of birds appeared to be altered near transmission lines (Southern, 1975; Larkin and Sutherland, 1977). However, these studies were of crude design, and Lee et al. (1996) concluded that, “During migration, birds must routinely fly over probably hundreds (or thousands) of electrical transmission and distribution lines. We are not aware of any evidence to suggest that such lines are disrupting migratory flights” (Lee et al., 1996:4-59). No further studies on this topic were identified in the literature.

Bees, like birds, are able to detect the earth’s dc magnetic fields. They are known to use magnetite particles, which are contained in an abdominal organ, as a compass (Kirschvink and Gould, 1981). In the laboratory, they are able to discriminate between a localized magnetic anomaly and a uniform background dc magnetic field (Walker et al., 1982; Kirschvink et al., 1992).

Greenberg et al. (1981) studied honeybee colonies placed near 765-kV transmission lines. They found that hives exposed to electric fields of 7 kV/m had decreased hive weight, abnormal amounts of propolis (a resinous material) at hive entrances, increased mortality and irritability, loss of the queen in some hives, and a decrease in the hive’s overall survival compared to hives that were not exposed. Exposure to electric fields of 7-12 kV/m may induce a current or heat the interior of the hive; however, placing the hive farther from the line, shielding the hive, or using hives without metallic parts eliminates this problem. IIT studied the effects of EMF on bees exposed to the 76-Hz antenna system at lower intensities and concluded that these behavioral effects of “ELF-EMF impacts are absent or at most minimal” (NRC, 1997:102).

Reptiles and amphibians contribute to the overall functioning of the forest ecosystems. However, little research has been performed on the effects of EMF on reptiles and amphibians in their natural habitat.

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3.2 Flora

Numerous studies have been carried out to assess the effect of exposure of plants to transmission-line electric and magnetic fields. These studies have involved both forest species and agriculture crops. Researchers have found no adverse effects on plant responses, including seed germination, seedling emergence, seedling growth, leaf area per plant, flowering, seed production, germination of the seeds, longevity, and biomass production (Lee et al., 1996).

The only confirmed adverse effect of transmission lines on plants was reported for transmission lines with voltages above 1200 kV. For example, Douglas Fir trees planted within 15 m of the conductors were shorter than trees planted away from the line. Shorter trees are believed to result from corona-induced damage to the branch tips. Trees between 15 and 30 m away from the line suffered needle burns, but those 30 m and beyond were not affected (Rogers et al., 1984). These effects would not occur at the lower field intensities expected beyond the right-of-way of the proposed 500-kV transmission line.

3.3 Summary

The habitat on the transmission-line rights-of-way and surrounding areas shields smaller animals from electric fields produced by high-voltage transmission lines; thus, vegetation easily shields small animals from electric fields. The greatest potential for larger animals to be exposed to EMF occurs when they are passing beneath the lines. Studies of animal reproductive performance, behavior, melatonin production, immune function, and navigation have found minimal or no effects of EMF. Past studies have found little effect of EMF on plants; no recent studies of plants growing near transmission lines have been performed. In summary, the literature published to date has shown little evidence of adverse effects of EMF from high-voltage transmission lines on wildlife and plants. At the field intensities associated with the proposed 500-kV transmission line, no adverse effects on wildlife or plants are expected.

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McNARY – JOHN DAY TRANSMISSION-LINE PROJECT

***ASSESSMENT OF RESEARCH REGARDING EMF AND
HEALTH AND ENVIRONMENTAL EFFECTS***

January, 2002

Prepared by

Exponent™

and

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for

Bonneville Power Administration

*Bonneville Power Administration/ McNary – John Day Transmission Line Project
Assessment of Research Regarding EMF and Health and Environmental Effects*

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ASSESSMENT OF RESEARCH REGARDING EMF AND HEALTH AND ENVIRONMENTAL EFFECTS

1.0 Introduction

Over the last 20 years, research has been conducted in the United States and around the world to examine whether exposures to electric and magnetic fields (EMF) at 50/60 Hertz (Hz) from electric power lines are a cause of cancer or adversely affect human health. The research included epidemiology studies that suggested a link with childhood leukemia for some types of exposures, as well as other epidemiology studies that did not; it also included lifetime animal studies, which showed no evidence of adverse health effects. Comprehensive reviews of the research conducted by governmental and scientific agencies in the U.S. and in the United Kingdom (UK) had examined the research, and did not find a basis for imposing additional restrictions (NIEHS, 1999; IEE, 2000).

The Bonneville Power Administration (BPA) requested that Exponent update the BPA on research on EMF and health in relation to exposures that might occur near the McNary – John Day Transmission Line Project. This update concentrates on recent major research studies to explain how they contribute to the assessment of effects of EMF on health (Section 2). The focus is on both epidemiologic and laboratory research, because these research approaches provide different and complementary information for determining whether an environmental exposure can affect human health. Section 3, Ecological Research, reviews studies of potential effects of EMF on plants and animals in the natural environment. This update includes studies of residential or environmental exposures to EMF and health effects that became available in 2001 (through November).

2.0 Health

2.1 The NIEHS Report and Research Program

In 1998, the NIEHS completed a comprehensive review of the scientific research on health effects of EMF. The NIEHS had been managing a research program that Congress funded in 1992 in response to questions regarding exposure to EMF from power sources. The program was known as the RAPID Program (Research and Public Information Dissemination Program). The NIEHS convened a panel of scientists (the “Working Group”) to review and evaluate the RAPID Program research and other research. Their report, *Assessment of Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, was completed in July 1998 (NIEHS, 1998).

The director of the NIEHS prepared a health risk assessment of EMF and submitted his report to Congress in June 1999 (NIEHS, 1999). Experts at NIEHS, who had considered the previous Working Group report, reports from four technical workshops, and research that became available after June 1998, concluded as follows:

The scientific evidence suggesting that ELF-EMF [extremely low frequency-electric and magnetic field] exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed

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adults. . . . In contrast, the mechanistic studies and animal toxicology literature fail to demonstrate any consistent pattern. . . . No indication of increased leukemias in experimental animals has been observed. . . . The lack of consistent, positive findings in animal or mechanistic studies weakens the belief that this association is actually due to ELF-EMF, but it cannot completely discount the epidemiology findings. . . . The NIEHS does not believe that other cancers or other non-cancer health outcomes provide sufficient evidence of a risk to currently warrant concern (NIEHS, 1999: 9-10).

Although the results of the RAPID research are described in some detail in the 1998 report, many of the studies had not been published in the peer-reviewed literature. Recognizing the need to have these results reviewed and considered for publication, the NIEHS arranged for a special edition of the journal *Radiation Research* (*Radiation Research*, 153[5], 2000) to be devoted to this topic.¹

2.2 Update of Research Related to Cancer

This update includes studies of residential or occupational exposures to EMF and leukemia that became available through November 2001, including several epidemiology studies of childhood cancer and meta-analyses. The California Department of Health Services (CDHS) conducted a workshop in 1999 to discuss epidemiologic research on EMF and health. The reports presented at this workshop were published in January 2001 as a supplement to the journal, *Bioelectromagnetics*. Many of the papers were technical discussions of methodology issues in epidemiologic studies of EMF, including discussions of how to better understand the conflicting results reported in previous studies (Neutra and Del Pizzo, 2001). For example, one study evaluates the extent to which systematic errors (known in epidemiology as selection bias or information bias) occurred in EMF studies, and if those errors occurred, whether the effect on results could be evaluated (Wartenberg, 2001a). Other researchers discuss epidemiologic approaches to study how possible confounding factors, such as the age and type of home and traffic density, might affect the interpretation of studies of EMF and childhood cancer (Langholz, 2001; Reynolds et al., 2001).

For this update, we reviewed epidemiology and laboratory studies of cancer and reproduction. Several of the studies are “meta-analyses,” an approach that incorporates statistical methods to analyze differences among studies and aggregate the results of smaller studies. The sections below include a review of meta-analyses of the studies of childhood leukemia, and a meta-analysis of studies of breast cancer in adults (Erren, 2001).

2.2.1 Epidemiology Studies of Children

The question of power lines and childhood cancer has been based on the assumption that the relevant exposure associated with power lines is the magnetic field, rather than the electric field. This assumption rests on the fact that electric fields are shielded from the interior of homes (where people spend the vast majority of their time) by walls and vegetation, while magnetic fields are not. The magnetic field in the vicinity of a power line results from the flow of current; higher currents result in higher levels of magnetic fields.

Epidemiologic studies report results in the form of statistical associations. The term “statistical association” is used to describe the tendency of two things to be linked or to vary in the same way, such

¹ See, for instance, the articles cited in the **List of References** under Balcer-Kubiczek, Boorman, Loberg, and Ryan.

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as level of exposure and occurrence of disease. However, statistical associations are not automatically an indication of cause and effect, because the interpretation of numerical information depends on the context, including (for example) the nature of what is being studied, the source of the data, how the data were collected, and the size of the study. The larger studies and more powerful studies of EMF have not reported convincing statistical associations between power lines and childhood leukemia (e.g., Linet et al., 1997; McBride et al., 1999; UKCCS, 1999). Despite the larger sample size, these studies usually had a limited number of cases exposed over 2 or 3 milligauss (mG).

Epidemiology Studies

The following discussion briefly describes major studies.

- A study from Germany included 514 children with leukemia and 1,301 control children (Schuz et al., 2001). Measurements of magnetic-field intensity (50 Hz) were taken for 24 hours in each child's bedroom. The results were calculated separately for daytime or nighttime levels in the bedroom, rather than for a child's overall 24-hour exposure. The authors report an association with leukemia for mean daytime magnetic-field exposures that might have been due to chance. They reported an association between mean nighttime magnetic-field levels and leukemia for the highest exposed group (4 mG or higher; 9 cases). The assessment of exposure by mean field levels in the bedroom did not link magnetic-field levels to any specific source. The authors note in their conclusions that “. . . fewer than one-third of all stronger magnetic fields were caused by high-voltage powerlines” (Schuz et al., 2001:734).

Several aspects of the study detract from the validity of the results: the estimate included a broad margin of error because only a small number of cases was exposed at the higher levels, and many eligible cases and controls did not participate, which means that the responders may not represent the population and results could be biased. Another concern is that these magnetic-field measurements were taken in 1997, long after the relevant exposure period for cases diagnosed in 1990-1994. Magnetic-field levels may have changed over time, as electricity usage changed.

- A study from British Columbia, Canada, included 462 children who had been diagnosed with leukemia and an equal number of children without leukemia for comparison (McBride et al., 1999). Magnetic-field exposure was assessed for each of the children in several ways: personal monitors were worn in a backpack for 48 hours, a monitor took measurements in the bedroom for 24 hours, the wiring outside the house was rated by potential exposure level (wire codes), and measurements were taken around the outside perimeter of the homes. (Wire codes are a method of estimating relative exposure intensity based on the configuration of the power lines.) Regardless of the method used to estimate magnetic-field exposure, the magnetic-field exposure of children who had leukemia was not greater than that of the children in the comparison group.
- A study conducted in Ontario, Canada reported on the magnetic-field exposure of a smaller group of children than in other recent studies (Green et al., 1999a). No increased risk estimates were found with the average magnetic fields in the bedroom or the interior, or with any of the three methods of estimating exposure from wire-configuration codes. A still smaller group of 88 children with leukemia and their controls wore personal monitors to measure magnetic fields (Green et al., 1999b). Associations with magnetic fields were reported in some of the analyses, but most of the risk estimates had a broad margin of error, and major methodological problems in the study preclude any clear interpretation of the findings.
- The United Kingdom Childhood Cancer Study, the largest study to date, included a total of 1073 childhood leukemia cases (UKCCS, 1999). Exposure was assessed by spot measurements in the

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home (bedroom and family room) and school, and summarized by averaging these over time. No evidence was found to support the idea of an increased risk of leukemia from exposures to magnetic fields inside or outside of the home.

- The UKCCS investigators had obtained magnetic-field measurements on only a portion of the childhood cancer cases in their study (UKCCS, 1999). To obtain additional information, they used a method to assess exposure to magnetic fields without entering homes; they were thus able to analyze 1331 child leukemia cases (UKCCS, 2000). For these children, they measured distances to power lines and substations. This information was used to calculate the magnetic field from these external field sources, based on power-line characteristics related to production of magnetic fields. The results of the second UKCCS study showed no evidence for an association with leukemia for magnetic fields calculated to be between 1 mG and 2 mG, 2 mG and 4 mG, or 4 mG or greater at the residence, in contrast to the weak association reported for measured fields of 4 mG or greater in the first report (UKCCS, 1999).

Researchers have proposed that the associations that are sometimes reported between childhood leukemia and power lines might be due to other factors that can confound (other risk factors for disease that may distort the analysis) the analysis. One example is heavy traffic, which may occur near power lines and which can increase the levels of potentially carcinogenic chemicals in the area. Earlier studies had reported associations between traffic density and childhood cancer (Savitz et al., 1988). If power lines were more common in areas that had higher traffic density, then the increased air pollution might explain an association between power lines and childhood cancer. However, more recent studies seem to eliminate this possibility. In a study of 90 cases of childhood leukemia, Reynolds et al. (2001) found no evidence of an association with traffic density. In a larger study that included 986 cases of childhood leukemia, no association was found with high traffic-density exposure during pregnancy or childhood (Raaschou-Nielsen et al., 2001).

Meta-analyses of Studies of Leukemia

Recently, researchers re-analyzed the data from previous epidemiology studies of magnetic fields and childhood leukemia (Ahlbom et al., 2000; Greenland et al., 2000). The researchers pooled the data on individuals from each of the studies, creating a study with a larger number of subjects and therefore greater statistical power than any single study. A pooled analysis is preferable to other types of meta-analyses in which the results from several studies are combined from grouped data obtained from the published studies. These analyses focused on studies that assessed exposure to magnetic fields using 24-hour measurements or calculations based on the characteristics of the power lines and current load. Both Ahlbom et al. and Greenland et al. used exposure categories of <1 mG (<0.1 microtesla [μ T]) as a reference category. The statistical results of these analyses can be summarized as follows:

- The pooled analyses provided no indication that wire codes are more strongly associated with leukemia than measured fields.
- Pooling these data corroborates an absence of an association between childhood leukemia and magnetic fields for exposures below 3 mG (0.3 μ T).
- Pooling these data results in a statistical association with leukemia for exposures greater than 3-4 mG (0.3 or 0.4 μ T).

The authors are appropriately cautious in the interpretation of their analyses, and they clearly identify the limitations in their evaluation of the original studies. Magnetic fields above 3 mG (0.3 μ T) in residences are estimated to be rather rare, about 3% in the U.S. (Zaffanella, 1993). Limitations include sparse data

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(few cases) to adequately characterize a relationship between magnetic fields and leukemia, uncertainties related to pooling different magnetic-field measures without evidence that all of the measures are comparable, and the incomplete and limited data on important confounders such as housing type and traffic density.

A meta-analysis of the data from epidemiologic studies of childhood leukemia studies was presented at the California Workshop and recently published (Wartenberg, 2001b). This meta-analysis did not have the advantage of obtaining and pooling the data on all of the individuals in the studies, unlike those published before it (Ahlbom et al., 2000; Greenland et al., 2000). Instead of using individual data, Wartenberg (2001b) used an approach that extracted the published results, reported as grouped data from several published studies. He used 19 studies overall, after excluding 7 studies that had insufficient data on individuals or deficiencies in the exposure assessment data. He reported a weak association for a) “proximity to electrical facilities” based on wire codes or distance, and b) magnetic-field level over 2 mG, based on either calculations from wiring and loading characteristics (if available) or on spot magnetic-field measurements. The results show more cases than controls exposed to measured or calculated fields above 2 mG. The author concludes that the analysis supports an association, although the size of the effect is small to moderate, but also notes “limitations due to design, confounding, and other biases may suggest alternative interpretations” (Wartenberg, 2001b:S-100).

The results of this meta-analysis are not directly comparable to previous ones regarding fields of 3 or 4 mG because the analysis was not based on individual data. The comparison of grouped data used different exposure cut points for the analysis and different criteria for the comparison group. None of these three analyses (Ahlbom et al., 2000; Greenland et al., 2000; Wartenberg, 2001b) included the results of the latest UK analysis of 1331 child leukemia cases based on calculated fields, which found no association between EMF and childhood leukemia or other cancers, regardless of the exposure level.

2.2.2 Epidemiology Studies of Adults

Studies of adults with certain types of cancer, such as brain cancer, breast cancer, or leukemia, have reported associations with exposure to magnetic fields at residences, but results have not been consistent across studies. Contradictory results among studies argue against a conclusion that the association reflects a cause-and-effect relationship. In their assessments of risk, scientists give most weight to studies that include more people, obtain more detailed and individual exposure assessments, and/or include people who have higher exposures.

A study of 492 adult cases of brain cancer in California included measurements of magnetic fields taken in the home and at the front door, and considered the types of power-line wiring (Wrensch et al., 1999). The authors report no evidence of increased risk with higher exposures, no association with type of power line, and no link with levels measured at the front door.

A number of recent studies of breast cancer focused on electric blankets as a source of high exposure. Electric blankets are assumed to be one of the strongest sources of EMF exposure in the home. Three studies of electric-blanket use found no evidence that long-term use increased the risk of breast cancer. Women who developed breast cancer reported no difference in total use of electric blankets, use in recent years, or use many years in the past:

- Gammon et al. (1998) reported that, even for those who kept the blanket on most of the time, no increase in risk was found for those who had longer duration of use (measured in months).

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- A study of 608 breast cancer cases found no evidence of increased use of electric blankets or other home appliances in cases compared to controls, and no indication of increasing risk with a longer time of use (Zheng et al., 2000).
- In a cohort of over 120,000 female nurses, data were obtained on known risk factors for breast cancer as well as electric-blanket use (Laden et al., 2000). For a large subset of this group, the questions about exposure were asked before the disease occurred, a step taken to eliminate bias in recalling exposure. No associations with electric blanket use were found.

Erren (2001) reported the results of a meta-analysis of the studies of breast cancer, in which the results of 24 different studies in women were statistically aggregated. When the results of all 24 studies, including studies of workplace exposures, were pooled, the estimate indicated an association between EMF and a small excess breast cancer risk. The pooled results for exposure to EMF in the vicinity of electrical facilities did not show an association with breast cancer, nor did the results for exposure to EMF from appliance use. However, the meta-analysis also showed a lack of consistency among the results of the individual studies, a broad variation in the designs, and a wide range of methods used to assess exposure. No adjustments were made to the data to give increased weight to studies based on more comprehensive exposure assessments. The author also noted that the weak statistical association might be an artifact (a result of chance or unforeseen error) rather than an indication of a cause-and-effect relationship (Erren, 2001).

2.2.3 Laboratory Studies of EMF

Laboratory studies complement epidemiologic studies of people because the effects of heredity, diet, and other health-related exposures of animals can be better controlled or eliminated. The assessment of EMF and health, as for any other exposure, includes chronic, long-term studies in animals (*in vivo* studies) and studies of changes in genes or other cellular processes observed in isolated cells and tissues in the laboratory (*in vitro*).

Although the results of the RAPID Program were described in some detail in the NIEHS reports (NIEHS, 1998), many of the studies had not been published in the peer-reviewed literature. The RAPID research program included studies of four biological effects, each of which had previously been observed in only one laboratory. These effects are as follows: effects on gene expression, increased intracellular calcium in a human cell line, proliferation of cell colonies on agar, and increased activity of the enzyme ornithine decarboxylase (ODC). Some scientists have suggested that these biological responses are signs of possible adverse health effects of EMF. It is standard scientific procedure to attempt to replicate results in other laboratories, because artifacts and investigator error can occur in scientific investigations. Replications, often using more experiments or more rigorous protocols, help to ensure objectivity and validity. Attempts at replication can substantiate and strengthen an observation, or they may discover the underlying reason for the observed response.

Studies in the RAPID program reported no consistent biological effects of EMF exposure on gene expression, intracellular calcium concentration, growth of cell colonies on agar, or ODC activity (Boorman et al., 2000b). For example, Balcer-Kubiczek et al. (2000) and Loberg et al. (2000) studied the expression of hundreds of cancer-related genes in human mammary or leukemia cell lines. They found no increase in gene expression with increased intensity of magnetic fields. To test the experimental procedure, they used X-rays and treatments known to affect the genes. These are known as positive controls and, as expected, caused gene expression in exposed cells.

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Scientists have concluded that the combined animal bioassay results provide no evidence that magnetic fields cause, enhance, or promote the development of leukemia and lymphoma, or mammary cancer (e.g., Boorman et al., 1999; McCormick et al., 1999; Boorman et al., 2000 a, b; Anderson et al., 2001).

2.2.4 Summary Regarding Cancer

Epidemiology studies do not support the idea that EMF from power lines increase the risk of cancers in adults. The latest epidemiologic studies of childhood cancer, considered in the context of the other data, provide no persuasive evidence that leukemia in children is causally associated with magnetic fields measured at the home, calculated magnetic fields based on distance and current loading, or wire codes. Recent meta-analyses reported no association between childhood cancer and magnetic fields below 2 or 3 mG. Although some association was reported for fields above this level, fields at most residences are likely to be below 3 or 4 mG. The authors of each of these analyses list several biases and problems that render the data inconclusive and prevent resolution of the inconsistencies in the epidemiologic data. For this reason, laboratory studies can provide important complementary information. Large, well-conducted animal studies and studies of initiation and promotion, provide no basis to conclude that EMF increases leukemia, lymphoma, breast, brain, or any other type of cancer.

2.3 Research Related to Reproduction

Previous epidemiologic studies reported no association with birth weight or fetal growth retardation after exposure to sources of relatively strong magnetic fields, such as electric blankets, or sources of typically weaker magnetic fields such as power lines (Bracken et al., 1995; Belanger et al., 1998).

A recent epidemiology study examined miscarriages² in relation to exposures to magnetic fields from electric bed-heating (electric blankets, heated waterbeds and mattress pads), which result in higher exposures than residential fields in general (Lee et al., 2000). The researchers assessed exposure prior to the birth (a prospective study) and included information to control for potential confounding factors (other exposures and conditions that affect the risk of miscarriage). This study had a large number of cases and high participation rates. Miscarriage rates were lower among users of electric bed-heating.

Studies of laboratory animals exposed to pure 60-Hz fields have shown no increase in birth defects, no multigenerational effects, and no changes that would indicate an increase in miscarriage or loss of fertility (e.g., Ryan et al., 1999; Ryan et al., 2000). Exposed and unexposed litters were no different in the amount of fetal loss and the number and type of birth defects, indicating no reproductive effect of EMF.

In summary, the recent evidence from epidemiology and laboratory studies provides no indication that exposure to power-frequency EMF has an adverse effect on reproduction, pregnancy, or growth and development of the embryo. The results of these recent studies are consistent with the conclusions of the NIEHS.

2.4 Power-line Electric Fields and Airborne Particles and Ions

Researchers from a university in England have suggested that the alternating-current (ac) electric fields from power lines might affect health indirectly, by interacting with the electrical charges on certain airborne particles in the air. They hypothesize that more particles would be deposited on the skin by a strong electric field, or in the lung by charges on particles (Henshaw et al., 1996; Fewes et al., 1999a, b).

² The medical term for miscarriage is spontaneous abortion.

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If this hypothesis were correct, and interaction did occur (i.e., the airborne particles were charged to increase deposition on skin and in lungs to a sufficient degree), then the researchers further hypothesize that human exposure to various airborne particles and disease might increase. These hypotheses remain highly speculative; scientists have found their assumptions unconvincing, and recognize data gaps in the steps of the hypotheses. Nevertheless, questions about effects of these charged particles have been raised in the media.

In their laboratory, Henshaw and colleagues have developed models to test the physical assumptions that are the first step of their hypotheses: that electric fields can change the behavior of particulates in the air. For example, they measured the deposition of radon daughter³ particles on metal plates, in the presence of electric fields at intensities found under or near power lines. They also reported increased deposition at similar electric field strengths outdoors near high voltage transmission lines. Under these conditions, deposition of products on surfaces was slightly increased, an occurrence that implies that the deposition might also occur on other surfaces, such as the skin. However, Henshaw and colleagues have not tested the most speculative parts of their hypothesis: that such changes in the deposition rate of particles would lead to an important increase in human exposure, and also that the increased skin exposure would be sufficient to affect human health, in this case to cause an increase in skin cancer. Given (a) the small change anticipated, (b) the ability of wind to disperse particles, and (c) the limited amount of time that people spend outdoors directly under high-voltage power lines, the assumption of health effects is unsupported (Swanson and Jeffers, 2000).

Henshaw et al. also hypothesize that ac electric fields at the surface of power line conductors lead to increased charges on particles, and thereby increase the likelihood that inhaled particles, including radon daughters, would be deposited on surfaces inside the lung or airways, even at considerable distances from the line. Air contains particles of various sizes, including aerosols⁴ from emissions from cars and trucks and manufacturing, as well as natural sources such as radon from soil, rock, and building materials. If, as hypothesized, charges on the aerosol particles were increased, and if this change were to increase deposition in the lungs when inhaled over long periods of time, in theory these events could lead to increases in respiratory disease, and possibly other diseases.

The physical basis for aspects of these hypotheses is reasonable. However, the other steps of the hypothesis are highly speculative, and the idea that power lines could substantially affect human exposure to airborne particles or lead to adverse health effects is unwarranted (Swanson and Jeffers, 2000).

The National Radiological Protection Board (NRPB) of Great Britain considered the hypotheses and data published by Fewes et al. regarding aerosol deposition increased by electric fields (1999a) and exposure to corona ions from power lines (1999b). The NRPB report (2001) concluded:

The physical principles for enhanced aerosol deposition in large electric fields are well understood. However, it has not been demonstrated that any such enhanced deposition will increase human exposure in a way that will result in adverse health effects to the general public (NRPB, 2001: 23).

2.5 Recent Reviews by Scientific Advisory Groups

Reviews of the scientific research regarding EMF and health by the Health Council of the Netherlands (HCN) were published in 2000 and updated in May 2001. The Institute of Electrical Engineers of Great

³ Radon daughters refers to the radioactive decay products of radon (²²²Rn).

⁴ An aerosol is a relatively stable suspension of solid particles or liquid droplets in a gaseous medium.

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Britain (IEE) published a review in 2000. The NRPB Advisory Group on Non-Ionising Radiation (AGNIR) published the most recent review in 2001. That review includes research published in 2000, and includes the most comprehensive discussion of the individual research studies. The International Agency for Research on Cancer (IARC) evaluated health effects of EMF and released a statement regarding their findings in June 2001.

2.5.1 National Radiological Protection Board of Great Britain (NRPB) Advisory Group on Non-Ionising Radiation

The conclusions from the report prepared by the NRPB's Advisory Group on Non-Ionising Radiation (AGNIR) on ELF-EMF and the risk of cancer are consistent with previous reviews. Members from universities, medical schools, and cancer research institutes reviewed the reports of experimental and epidemiological studies, including reports in the literature in 2000. Their general conclusions are as follows:

Laboratory experiments have provided no good evidence that extremely low frequency electromagnetic fields are capable of producing cancer, nor do human epidemiological studies suggest that they cause cancer in general. There is, however, some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukaemia in children. In practice, such levels of exposure are seldom encountered by the general public in the UK [or in the U.S.] (NRPB, 2001: 164).

The group further recognizes that the scientific evidence suggesting that exposure to power-frequency electromagnetic fields poses an increased risk of cancer is very weak. Virtually all of the cellular, animal and human laboratory evidence provides no support for an increased risk of cancer incidence following such exposure to power frequencies, although sporadic positive findings have been reported. In addition, the epidemiological evidence is, at best, weak.

These conclusions of the Advisory Group are consistent with previous reviews by the NIEHS (1999) and the Health Council of the Netherlands (HCN, 2000). The NRPB response to the Advisory Group report states that "the review of experimental studies by [the Advisory Group] AGNIR gives no clear support for a causal relationship between exposure to ELF-EMFs and cancer" (NRPB, 2001: 1).

2.5.2 Health Council of the Netherlands (HCN)

The Health Council of the Netherlands has prepared updates of its 1992 Advisory Report on exposure to electromagnetic fields (0 Hz to 10 MHz) (HCN, 2000; 2001). Members of the Expert Committee who prepared the report include specialists in physics, biology, and epidemiology. The Expert Committee based its analysis on the review and summaries of the studies provided in the NIEHS (1998) and concurred with the views of the director of the NIEHS (1999). For the update, the Committee evaluated a number of publications that appeared after these reports, e.g., McBride et al., (1999) and Green et al. (1999a), and wrote:

The committee thinks that the quality of the relevant epidemiological research has improved considerably since the publication of the advisory report in 1992. Even so, this research has not resulted in unequivocal, scientifically reliable conclusions (HCN, 2000: 15).

The Council emphasizes that the associations with EMF reported in epidemiologic studies are strictly statistical and do not demonstrate a cause-and-effect relationship. In their view, experimental research

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does not demonstrate a causal link or a mechanism to explain EMF as a cause of disease in humans. They concluded that there is no reason to recommend measures to limit residence near overhead power lines (HCN, 2000).

The 2001 update (HCN, 2001) includes three major studies (described above) published in 2000 and 2001 (Ahlbom et al., 2000; Greenland et al., 2000; Wartenberg 2001b). The Council concludes:

Because the association is only weak and without a reasonable biological explanation, it is not unlikely that [an association between ELF exposure and childhood leukemia] could also be explained by chance The committee therefore sees no reason to modify its earlier conclusion that the association is not likely to be indicative of a causal relationship (HCN, 2001: 40).

2.5.3 Institution of Electrical Engineers (IEE) of Great Britain

One of the recent reviews was that of the Institution of Electrical Engineers (IEE) of Great Britain (IEE, 2000). In 1992, the IEE set up a Working Party whose eight members, with broad expertise in the health sciences, review the relevant scientific literature and prepare reports of their views. Their conclusion is based on recent major epidemiologic studies and the scientific literature built up over the past 20 years. In May 2000, the Working Party concluded “. . . that there is still not convincing scientific evidence showing harmful effects of low level electromagnetic fields on humans” (IEE, 2000:1).

2.5.4 International Agency for Research on Cancer (IARC)

The International Agency for Research on Cancer sponsored a review of EMF research by a Working Group of scientific experts from 10 countries. This multidisciplinary group reviewed health effects of ELF-EMF. Although their monograph is still in preparation, IARC has released a summary of the Group's conclusions. The Working Group concluded that the epidemiologic studies do not provide support for an association between childhood leukemia and residential magnetic fields at intensities less than 4 mG. IARC reviewers also evaluated the animal data and concluded that it was “inadequate” to support a risk for cancer. Their summary states that the EMF data does not merit the category “carcinogenic to humans” or the category “probably carcinogenic to humans,” nor did they find that “the agent is probably not carcinogenic to humans” (IARC, 2001).

2.6 Summary

The results of the latest epidemiologic studies of childhood cancer do not provide convincing evidence to support the hypothesis that exposure to magnetic fields or power lines near the home are a cause of leukemia in children. The larger, more reliable, residential studies do not support the idea that fields in the residence contribute to the risk of cancer in adults. Although epidemiology studies provide evidence most relevant to humans, the results may include uncertainties because they are observational rather than experimental. For this reason, laboratory studies can provide important complementary information. The larger and more thorough animal studies that exposed animals for EMF for their entire lifespan show no increases in cancer or other adverse health effects, including reproduction outcomes, in exposed animals.

3.0 Ecological Research

Scientists have studied the effects of high-voltage transmission lines on many plant and animal species in the natural environment. In this section, the research on the effects of EMF on ecological systems to assess the likelihood of adverse impacts was briefly reviewed. In addition to the comprehensive review

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of research on this topic by wildlife biologists at BPA (Lee et al., 1996), a search of the published scientific literature for more recent studies published between 1995 and June 2001 was conducted.

3.1 Fauna

The habitat on the transmission-line right-of-way and surrounding area shields most wildlife from electric fields. Vegetation in the form of grasses, shrubs, and small trees largely shields small ground-dwelling species such as mice, rabbits, foxes, and snakes from electric fields. Species that live underground, such as moles, woodchucks, and worms, are further shielded from electric fields by the soil. Hence, large species such as deer and domestic livestock (e.g., sheep and cattle) have greater potential exposures to electric fields since they can stand taller than surrounding vegetation. However, the duration of exposure for deer and other large animals is likely to be limited to foraging bouts or the time it takes them to cross under the line. Furthermore, all species would be exposed to higher magnetic fields under a transmission line than elsewhere, as the vegetation and soil do not provide shielding from this aspect of the transmission-line electrical environment.

Field studies have been performed in which the behavior of large mammals in the vicinity of high-voltage transmission lines was monitored. No effects of electric or magnetic fields were evident in two studies from the northern United States on big game species, such as deer and elk, exposed to a 500-kilovolt (kV) transmission line (Goodwin 1975; Picton et al., 1985). In such studies, a possible confounding factor is audible noise. Audible noise associated with high-voltage power transmission lines (with voltages greater than 110-kV) is due to corona. Audible noise generated by transmission lines reaches its highest levels in inclement weather (rain or snow).

Much larger populations of animals that might spend time near a transmission line are livestock that graze under or near transmission lines. To provide a more sensitive and reliable test for adverse effects than informal observation, scientists have studied animals continuously exposed to fields from the lines in relatively controlled conditions. For example, grazing animals such as cows and sheep have been exposed to high-voltage transmission lines and their reproductive performance examined (Lee et al., 1996). No adverse effects were found among cattle exposed over one or more successive breedings to a 500-kV direct-current overhead transmission line (Angell et al., 1990). Compared to unexposed animals in a similar environment, the exposure to 50-Hz fields did not affect reproductive functions or pregnancy of cows (Algers and Hennichs, 1985; Algers and Hultgren, 1987).

A group of investigators from Oregon State University, Portland State University, and other academic centers evaluated the effects of long-term exposure to EMF from a 500-kV transmission line operated by BPA on various cellular aspects of immune response, including the production of proteins by leukocytes (IL-1 and IL-2) of sheep. In previous unpublished reports, the researchers found differences in IL-1 activity between exposed and control groups. However, in their most recent replication, the authors found no evidence of differences in these measures of immune function. The sheep were exposed to 27 months of continuous exposure to EMF, a period of exposure much greater than the short, intermittent exposures that sheep would incur grazing under transmission lines. Mean exposures of EMF were 3.5-3.8 μ T (35-38 mG) and 5.2-5.8 kV/m, respectively (Hefeneider et al., 2001).

Scientists from the Illinois Institute of Technology (IIT) monitored the possible effects of electric and magnetic fields on fauna and flora in Michigan and Wisconsin from 1969 – 1997 to evaluate the effects of an above-ground, military-communications antenna operating at 76 Hz. The antenna produces EMF similar in physical characteristics to those produced by high-voltage transmission lines, but of much lower intensity. This study, which included embryonic development, fertility, postnatal growth, maturation, aerobic metabolism, and homing behavior, showed no adverse impacts of ELF electric and magnetic fields on the animals (NRC, 1997).

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The hormone melatonin, secreted at night by the pineal gland, plays a role in animals that are seasonal breeders. Studies in laboratory mice and rats have suggested that exposure to electric and/or magnetic fields might affect levels of the hormone melatonin, but results have not been consistent (Wilson et al., 1981; Holmberg, 1995; Kroeker et al., 1996; Vollrath et al., 1997; Huuskonen et al., 2001). However, when researchers examined sheep and cattle exposed to EMF from transmission lines exceeding 500-kV, they found no effect on the levels of the hormone melatonin in blood, weight gain, onset of puberty, or behavior in sheep and cattle (Stormshak et al., 1992; Lee et al., 1993; Lee et al., 1995; Thompson et al., 1995; Burchard et al., 1998).

Another part of the IIT study examined the effect of the antenna system fields on the growth, development, and homing behavior of birds. Studies of embryonic development (Beaver et al., 1993), fertility, postnatal growth, maturation, aerobic metabolism, and homing behavior showed no adverse impacts of ELF electric and magnetic fields on the animals (NRC, 1997). Fernie and colleagues studied the effects of continuous EMF exposure of raptors to an electric field of 10 kV/m in a controlled, laboratory setting. The exposure was designed to mimic exposure to a 765-kV transmission line. Continuous EMF exposure was found to reduce hatching success and increase egg size, fledging success, and embryonic development (Fernie et al., 2000). In a study of the effects on body mass and food intake of reproducing falcons, the authors found that EMF lengthened the photoperiod as a result of altered melatonin levels in the male species, yet concluded that “EMF effects on adult birds may only occur after continuous, extended exposure,” which is not likely to occur from resting on power lines (Fernie and Bird, 1999:620).

Several avian species are reported to use the earth's magnetic field as one of the cues for navigation. It has been proposed that deposits of magnetite in specialized cells in the head are the mechanism by which the birds can detect variations in the inclination and intensity of a direct-current (dc) magnetic field (Kirschvink and Gould, 1981; Walcott et al., 1988). In early studies of transmission lines, it was reported that the migratory patterns of birds appeared to be altered near transmission lines (Southern, 1975; Larkin and Sutherland, 1977). However, these studies were of crude design, and Lee et al. (1996) concluded that, “During migration, birds must routinely fly over probably hundreds (or thousands) of electrical transmission and distribution lines. We are not aware of any evidence to suggest that such lines are disrupting migratory flights” (Lee et al., 1996:4-59). No further studies on this topic were identified in the literature.

Bees, like birds, are able to detect the earth's dc magnetic fields. They are known to use magnetite particles, which are contained in an abdominal organ, as a compass (Kirschvink and Gould, 1981). In the laboratory, they are able to discriminate between a localized magnetic anomaly and a uniform background dc magnetic field (Walker et al., 1982; Kirschvink et al., 1992).

Greenberg et al. (1981) studied honeybee colonies placed near 765-kV transmission lines. They found that hives exposed to electric fields of 7 kV/m had decreased hive weight, abnormal amounts of propolis (a resinous material) at hive entrances, increased mortality and irritability, loss of the queen in some hives, and a decrease in the hive's overall survival compared to hives that were not exposed. Exposure to electric fields of 7-12 kV/m may induce a current or heat the interior of the hive; however, placing the hive farther from the line, shielding the hive, or using hives without metallic parts eliminates this problem. IIT studied the effects of EMF on bees exposed to the 76-Hz antenna system at lower intensities and concluded that these behavioral effects of “ELF-EMF impacts are absent or at most minimal” (NRC, 1997:102).

Reptiles and amphibians contribute to the overall functioning of the forest ecosystems. However, little research has been performed on the effects of EMF on reptiles and amphibians in their natural habitat.

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3.2 Flora

Numerous studies have been carried out to assess the effect of exposure of plants to transmission-line electric and magnetic fields. These studies have involved both forest species and agriculture crops. Researchers have found no adverse effects on plant responses, including seed germination, seedling emergence, seedling growth, leaf area per plant, flowering, seed production, germination of the seeds, longevity, and biomass production (Lee et al., 1996).

The only confirmed adverse effect of transmission lines on plants was reported for transmission lines with voltages above 1200 kV. For example, Douglas Fir trees planted within 15 m of the conductors were shorter than trees planted away from the line. Shorter trees are believed to result from corona-induced damage to the branch tips. Trees between 15 and 30 m away from the line suffered needle burns, but those 30 m and beyond were not affected (Rogers et al., 1984). These effects would not occur at the lower field intensities expected beyond the right-of-way of the proposed 500-kV transmission line.

3.3 Summary

The habitat on the transmission-line rights-of-way and surrounding areas shields smaller animals from electric fields produced by high-voltage transmission lines; thus, vegetation easily shields small animals from electric fields. The greatest potential for larger animals to be exposed to EMF occurs when they are passing beneath the lines. Studies of animal reproductive performance, behavior, melatonin production, immune function, and navigation have found minimal or no effects of EMF. Past studies have found little effect of EMF on plants; no recent studies of plants growing near transmission lines have been performed. In summary, the literature published to date has shown little evidence of adverse effects of EMF from high-voltage transmission lines on wildlife and plants. At the field intensities associated with the proposed 500-kV transmission line, no adverse effects on wildlife or plants are expected.

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MCNARY – JOHN DAY 500-kV
TRANSMISSION-LINE PROJECT

ELECTRICAL EFFECTS

January 2002

Prepared by
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for
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*Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Electrical Effects*

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ELECTRICAL EFFECTS FROM THE PROPOSED MCNARY — JOHN DAY TRANSMISSION-LINE PROJECT

1.0 Introduction

The Bonneville Power Administration (BPA) is proposing to build a 87-mile (mi.) (140- kilometer [km]) 500-kilovolt (kV) transmission line from the existing BPA McNary Substation near the McNary Dam on the Columbia River, to the existing BPA John Day Substation near the John Day Dam on the Columbia River. The proposed line is designated the McNary – John Day 500-kV line. The proposed line would be built on new and existing right-of-way. Although both substations are located on the south (Oregon) side of the river, most of the proposed line route is on the north (Washington) side of the river. For most of its length the proposed line would parallel existing 230- and 345-kV lines. For some portions of the route, the proposed line would also parallel existing 500-kV lines and in one section there would be no parallel lines within about 600 feet of the line. The parallel line configurations and their lengths are given in Table 1. The purpose of this report is to describe and quantify the electrical effects of the proposed McNary – John Day 500-kV transmission line. These effects include the following:

- the levels of 60-hertz (Hz; cycles per second) electric and magnetic fields (EMF) at 3.28 feet (ft.) or 1 meter (m) above the ground,
- the effects associated with those fields,
- the levels of audible noise produced by the line, and
- electromagnetic interference associated with the line.

Electrical effects occur near all transmission lines, including those 500-kV lines already present in the area of the proposed route for the McNary – John Day line. Therefore, the levels of these quantities for the proposed line are computed and compared with those from the existing lines in Oregon, Washington, and elsewhere.

The voltage on the conductors of transmission lines generates an *electric field* in the space between the conductors and the ground. The electric field is calculated or measured in units of volts-per-meter (V/m) or kilovolts-per-meter (kV/m) at a height of 3.28 ft. (1 m) above the ground. The current flowing in the conductors of the transmission line generates a *magnetic field* in the air and earth near the transmission line; current is expressed in units of amperes (A). The magnetic field is expressed in milligauss (mG), and is also usually measured or calculated at a height of 3.28 ft. (1 m) above the ground. The electric field at the surface of the conductors causes the phenomenon of *corona*. Corona is the electrical breakdown or ionization of air in very strong electric fields, and is the source of audible noise, electromagnetic radiation, and visible light.

To quantify EMF levels along the route, the electric and magnetic fields from the proposed and existing lines were calculated using the BPA Corona and Field Effects Program (USDOE, undated). In this program, the calculation of 60-Hz fields uses standard superposition techniques for vector fields from several line sources: in this case, the line sources are transmission-line conductors. (Vector fields have both magnitude and direction: these must be taken into account when combining fields from different sources.) Important input parameters to the computer program are voltage, current, and geometric

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configuration of the line. The transmission-line conductors are assumed to be straight, parallel to each other, and located above and parallel to an infinite flat ground plane. Although such conditions do not occur under real lines because of conductor sag and variable terrain, the validity and limitations of calculations using these assumptions have been well verified by comparisons with measurements. This approach was used to estimate fields for the proposed McNary – John Day line, where minimum clearances were assumed to provide worst-case (highest) estimates for the fields.

Electric fields are calculated using an imaging method. Fields from the conductors and their images in the ground plane are superimposed with the proper magnitude and phase to produce the total field at a selected location.

The total magnetic field is calculated from the vector summation of the fields from currents in all the transmission-line conductors. Balanced currents are assumed for each three-phase circuit; the contribution of induced image currents in the conductive earth is not included.

Electric and magnetic fields for the proposed line were calculated at the standard height (3.28 ft. or 1 m) above the ground (IEEE, 1987). Calculations were performed out to 300 ft. (91 m) from the centerline of the existing corridor. The validity and limitations of such calculations have been well verified by measurements. Because maximum voltage, maximum current, and minimum conductor height above-ground are used, ***the calculated values given here represent worst-case conditions:*** i.e., the calculated fields are higher than they would be in practice. Such worst-case conditions would seldom occur.

The corona performance of the proposed line was also predicted using the BPA Corona and Field Effects Program (USDOE, undated). Corona performance is calculated using empirical equations that have been developed over several years from the results of measurements on numerous high-voltage lines (Chartier and Stearns, 1981; Chartier, 1983). The validity of this approach for corona-generated audible noise has been demonstrated through comparisons with measurements on other lines all over the United States (IEEE Committee Report, 1982). The accuracy of this method for predicting corona-generated radio and television interference from transmission lines has also been established (Olsen et al., 1992). Important input parameters to the computer program are voltage, current, conductor size, and geometric configuration of the line.

Corona is a highly variable phenomenon that depends on conditions along a length of line. Predictions of the levels of corona effects are reported in statistical terms to account for this variability. Calculations of audible noise and electromagnetic interference levels were made under conditions of an estimated average operating voltage (98 percent of maximum voltage) and with the average line height over a span: 540 kV and about 45 ft. (13.7 m) clearance for the proposed 500-kV line. Levels of audible noise, radio interference, and television interference are predicted for both fair and foul weather; however, corona is basically a foul-weather phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Along the route of the proposed McNary – John Day transmission line, such conditions are expected to occur about 1% of the time during a year, based on hourly precipitation records recorded at Arlington, Oregon during 1997 – 2000. Corona activity also increases with altitude. For purposes of evaluating corona effects from the proposed line, an altitude of 600 ft. (183 m) was assumed.

2.0 Physical Description

2.1 Proposed Line

The proposed 500-kV transmission line would be a three-phase, single-circuit line with the phases arranged in a delta (triangular) configuration. The maximum phase-to-phase voltage would be 550 kV; the average voltage would be 540 kV. The maximum electrical current on the line would be 1758 A per phase, based on the BPA projected normal system annual peak load with 2004 as the base year. The load factor for this load would be about 0.50 (average load = peak load x load factor). BPA provided the physical and operating characteristics of the proposed and existing lines.

The electrical characteristics and physical dimensions for the configuration of the proposed line are shown in Figure 1, and summarized in Table 2. Each phase of the proposed 500-kV line would have three 1.3-inch (in.) (3.30-centimeter [cm]) diameter conductors (ACSR: steel-reinforced aluminum conductor) arranged in an inverted triangle bundle configuration, with 17-in. (43.3-cm) spacing between conductors. Voltage and current waves are displaced by 120° in time (one-third of a cycle) on each electrical phase. The horizontal phase spacing between the lower conductor positions would be 48 ft. (14.6 m). The vertical spacing between the conductor positions would be 34.5 ft. (10.5 m). (The spacing between conductor locations would vary slightly where special towers are used, such as at angle points along the line.)

Minimum conductor-to-ground clearance would be 35 ft. (10.7 m) at a conductor temperature of 122°F (50°C), which represents maximum operating conditions and high ambient air temperatures; clearances above ground would be greater under normal operating temperatures. The average clearance above ground along a span would be approximately 45 ft. (13.7 m); this value was used for corona calculations. At road crossings, the ground clearance would be at least 54 ft. (16.5 m). The 35-ft. (10.7-m) minimum clearance provided by BPA is greater than the minimum distance of the conductors above ground required to meet the National Electrical Safety Code (NESC) (IEEE, 2002). The final design of the proposed line could entail larger clearances. The right-of-way width for the proposed line would vary depending on location and the presence of parallel lines. The distance from the centerline of the proposed line to the edge of the right-way would vary from 72.5 ft. (22 m) to 187.5 ft. (57 m).

2.2 Existing Lines

Six possible corridor configurations were identified for analyzing electrical effects along the route from McNary Substation to John Day Substation (Table 1). These configurations are:

- 1) the proposed line parallel to and north of the existing McNary – Horse Heaven – Harvalum 230-kV and McNary – Ross No. 1 345-kV lines;
- 2) the proposed line parallel to and north of the existing 230-kV and 345-kV lines and the existing Ashe – Marion No. 1/Ashe – Slatt No. 1 double circuit 500-kV line;
- 3) the proposed line with no parallel lines within 600 feet;
- 4) the proposed line parallel to and 125 feet south of the existing 230-kV and 345-kV lines and the existing Hanford – John Day 500-kV line;

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- 4A) the proposed line located on the existing Hanford – John Day 500-kV towers and parallel to and north of the existing McNary – Horse Heaven – Harvalum 230-kV and McNary – Ross No. 1 345-kV lines (The existing Hanford – John Day 500-kV line would be relocated on new towers north of the proposed line.); and
- 4B) the proposed line parallel to and 275 feet south of the existing 230-kV and 345-kV lines and the existing Hanford – John Day 500-kV line.

Configurations 4, 4A, and 4B are possible alternatives in the short section of the route where the proposed line parallels the existing Hanford – John Day 500-kV line; their presence and respective lengths would depend on the final engineering design for the line.

The physical and electrical characteristics of the corridor configurations that were analyzed are given in Table 2; cross-sections of the corridors are shown in Figure 1. Short sections of the proposed line entering the substations were not analyzed.

Changes in the electrical phasing of the existing lines in Configuration 1 occur and would affect field levels slightly. The four phasing schemes produce similar electric and magnetic fields and only the maximum results for field calculations are included here. In portions of Configuration 1, it may be necessary to increase the ground clearance to 37 feet (11.3 m) to ensure that the BPA criterion of 9 kV/m for peak electric field is met. BPA would select the means of achieving the 9-kV/m field criterion during the engineering design of the line. Corona effects from all phasing schemes of Configuration 1 were essentially the same. The maximum levels for fields and corona effects computed for the different phasing schemes are reported here.

3.0 Electric Field

3.1 Basic Concepts

An electric field is said to exist in a region of space if an electrical charge, at rest in that space, experiences a force of electrical origin (i.e., electric fields cause free charges to move). Electric field is a vector quantity: that is, it has both magnitude and direction. The direction corresponds to the direction that a positive charge would move in the field. Sources of electric fields are unbalanced electrical charges (positive or negative) and time-varying magnetic fields. Transmission lines, distribution lines, house wiring, and appliances generate electric fields in their vicinity because of unbalanced electrical charge on energized conductors. The unbalanced charge is associated with the voltage on the energized system. On the power system in North America, the voltage and charge on the energized conductors are cyclic (plus to minus to plus) at a rate of 60 times per second. This changing voltage results in electric fields near sources that are also time-varying at a frequency of 60 hertz (Hz; a frequency unit equivalent to cycles per second).

As noted earlier, electric fields are expressed in units of volts per meter (V/m) or kilovolts (thousands of volts) per meter (kV/m). Electric- and magnetic-field magnitudes in this report are expressed in root-mean-square (rms) units. For sinusoidal waves, the rms amplitude is given as the peak amplitude divided by the square root of two.

The spatial uniformity of an electric field depends on the source of the field and the distance from that source. On the ground, under a transmission line, the electric field is nearly constant in magnitude and direction over distances of several feet (1 meter). However, close to transmission- or distribution-line

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conductors, the field decreases rapidly with distance from the conductors. Similarly, near small sources such as appliances, the field is not uniform and falls off even more rapidly with distance from the device. If an energized conductor (source) is inside a grounded conducting enclosure, then the electric field outside the enclosure is zero, and the source is said to be shielded.

Electric fields interact with the charges in all matter, including living systems. When a conducting object, such as a vehicle or person, is located in a time-varying electric field near a transmission line, the external electric field exerts forces on the charges in the object, and electric fields and currents are induced in the object. If the object is grounded, then the total current induced in the body (the "short-circuit current") flows to earth. The distribution of the currents within, say, the human body, depends on the electrical conductivities of various parts of the body: for example, muscle and blood have higher conductivity than bone and would therefore experience higher currents.

At the boundary surface between air and the conducting object, the field both in the air and perpendicular to the conductor surface is much, much larger than the field in the conductor itself. For example, the average surface field on a human standing in a 10 kV/m field is 27 kV/m; the internal fields in the body are much smaller: approximately 0.008 V/m in the torso and 0.45 V/m in the ankles.

3.2 Transmission-line Electric Fields

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, towers, vegetation, buildings, vehicles, and people. The calculated strength of the electric field at a height of 3.28 ft. (1 m) above an unvegetated, flat earth is frequently used to describe the electric field under straight parallel transmission lines. The most important transmission-line parameters that determine the electric field at a 1-m height are conductor height above ground and line voltage.

Calculations of electric fields from transmission lines are performed with computer programs based on well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values under these conditions represent an ideal situation. When practical conditions approach this ideal model, measurements and calculations agree. Often, however, conditions are far from ideal because of variable terrain and vegetation. In these cases, fields are calculated for ideal conditions, with the lowest conductor clearances to provide upper bounds on the electric field under the transmission lines. With the use of more complex models or empirical results, it is also possible to account accurately for variations in conductor height, topography, and changes in line direction. Because the fields from different sources add vectorially, it is possible to compute the fields from several different lines if the electrical and geometrical properties of the lines are known. However, in general, electric fields near transmission lines with vegetation below are highly complex and cannot be calculated. Measured fields in such situations are highly variable.

For evaluation of EMF from transmission lines, the fields must be calculated for a specific line condition. The NESC states the condition for evaluating electric-field-induced short-circuit current for lines with voltage above 98 kV, line-to-ground, as follows: conductors are at a minimum clearance from ground corresponding to a conductor temperature of 120°F (49°C), and at a maximum voltage (IEEE, 2002). BPA has supplied the needed information for calculating electric and magnetic fields from the proposed transmission lines: the maximum operating voltage, the estimated peak current in 2004, and the minimum conductor clearances.

There are standard techniques for measuring transmission-line electric fields (IEEE, 1987). Provided that the conditions at a measurement site closely approximate those of the ideal situation assumed for

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calculations, measurements of electric fields agree well with the calculated values. If the ideal conditions are not approximated, the measured field can differ substantially from calculated values. Usually the actual electric field at ground level is reduced from the calculated values by various common objects that act as shields.

Maximum or peak field values occur over a small area at midspan, where conductors are closest to the ground. As the location of an electric-field profile approaches a tower, the conductor clearance increases, and the peak field decreases. A grounded tower will reduce the electric field considerably by shielding. For the parallel-line configurations considered here, minimum conductor clearances were assumed to occur along the same lateral profile for both lines. This condition will not necessarily occur in practice, because the towers for the parallel lines may be offset or located at different elevations. **The assumption of simultaneous minimum clearance results in peak (worst-case) fields that may be larger than what occurs in practice.**

For traditional transmission lines, such as the proposed line, where the right-of-way extends laterally well beyond the conductors, electric fields at the edge of the right-of-way are not as sensitive as the peak field to conductor height. Computed values at the edge of the right-of-way for any line height are fairly representative of what can be expected all along the transmission-line corridor. However, the presence of vegetation on and at the edge of the right-of-way will reduce actual electric-field levels below calculated values. The triangular arrangement of the conductor bundles for the proposed line reduces the electric and magnetic field levels below what they would be for a flat conductor arrangement.

3.3 Calculated Values of Electric Fields

Table 3 shows the calculated values of electric field at 3.28 ft. (1 m) above ground for the proposed McNary – John Day 500-kV transmission-line configurations. The peak value on the right-of-way and the value at the edge of the right-of-way are given for the six proposed configurations at minimum conductor clearances and at the estimated average clearance over a span. Figure 2 shows lateral profiles for the electric field for both existing and proposed configurations. Electric fields for the minimum and average line heights for the proposed line with no immediately adjacent parallel lines are shown in Figure 2c.

The calculated peak electric field expected on the right-of-way of the proposed line is 8.97 kV/m or less, depending on the configuration. For average clearance, the peak field would be 6.0 kV/m or less. As shown in Figure 2, the peak values would be present only at locations directly under the line, near mid-span, where the conductors are at the minimum clearance. The conditions of minimum conductor clearance at maximum current and maximum voltage occur very infrequently. The calculated peak levels are rarely reached under real-life conditions, because the actual line height is generally above the minimum value used in the computer model, because the actual voltage is below the maximum value used in the model, and because vegetation within and near the edge of the right-of-way tends to shield the field at ground level. The largest value expected at the edge of the right-of-way of the proposed line would be 2.8 kV/m. Maximum electric fields under the existing parallel 500-kV, 345-kV, and 230-kV lines are 8.9, 4.7 and 4.5 kV/m, respectively.

3.4 Environmental Electric Fields

The electric fields associated with the McNary – John Day 500-kV line can be compared with those found in other environments. Sources of 60-Hz electric (and magnetic) fields exist everywhere electricity is used; levels of these fields in the modern environment vary over a wide range. Electric-field

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levels associated with the use of electrical energy are orders of magnitude greater than naturally occurring 60-Hz fields of about 0.0001 V/m, which stem from atmospheric and extraterrestrial sources.

Electric fields in outdoor, publicly accessible places range from less than 1 V/m to 12 kV/m; the large fields exist close to high-voltage transmission lines of 500 kV or higher. In remote areas without electrical service, 60-Hz field levels can be much lower than 1 V/m. Electric fields in home and work environments generally are not spatially uniform like those of transmission lines; therefore, care must be taken when making comparisons between fields from different sources such as appliances and electric lines. In addition, fields from all sources can be strongly modified by the presence of conducting objects. However, it is helpful to know the levels of electric fields generated in domestic and office environments in order to compare commonly experienced field levels with those near transmission lines.

Numerous measurements of residential electric fields have been reported for various parts of the United States, Canada, and Europe. Although there have been no large studies of residential electric fields, sufficient data are available to indicate field levels and characteristics. Measurements of domestic 60-Hz electric fields indicate that levels are highly variable and source-dependent. Electric-field levels are not easily predicted because walls and other objects act as shields, because conducting objects perturb the field, and because homes contain numerous localized sources. Internal sources (wiring, fixtures, and appliances) seem to predominate in producing electric fields inside houses. Average measured electric fields in residences are generally in the range of 5 to 20 V/m. In a large occupational exposure monitoring project that included electric-field measurements at homes, average exposures for all groups away from work were generally less than 10 V/m (Bracken, 1990).

Electric fields from household appliances are localized and decrease rapidly with distance from the source. Local electric fields measured at 1 ft. (0.3 m) from small household appliances are typically in the range of 30 to 60 V/m. Stopps and Janischewskyj (1979) reported electric-field measurements near 20 different appliances; at a 1-ft. (0.3-m) distance, fields ranged from 1 to 150 V/m, with a mean of 33 V/m. In another survey, reported by Deno and Zaffanella (1982), field measurements at a 1-ft. (0.3-m) distance from common domestic and workshop sources were found to range from 3 to 70 V/m. The localized fields from appliances are not uniform, and care should be taken in comparing them with transmission-line fields.

Electric blankets can generate higher localized electric fields. Sheppard and Eisenbud (1977) reported fields of 250 V/m at a distance of approximately 1 ft. (0.3 m). Florig et al. (1987) carried out extensive empirical and theoretical analysis of electric-field exposure from electric blankets and presented results in terms of uniform equivalent fields such as those near transmission lines. Depending on what parameter was chosen to represent intensity of exposure and the grounding status of the subject, the equivalent vertical 60-Hz electric-field exposure ranged from 20 to over 3500 V/m. The largest equivalent field corresponds to the measured field on the chest with the blanket-user grounded. The average field on the chest of an ungrounded blanket-user yields an equivalent vertical field of 960 V/m. As manufacturers have become aware of the controversy surrounding EMF exposures, electric blankets have been redesigned to reduce *magnetic* fields. However, electric fields from these “low field” blankets are still comparable with those from older designs (Bassen et al., 1991).

Generally, people in occupations not directly related to high-voltage equipment are exposed to electric fields comparable with those of residential exposures. For example, the average electric field measured in 14 commercial and retail locations in rural Wisconsin and Michigan was 4.8 V/m (ITT Research Institute, 1984). Median electric field was about 3.4 V/m. These values are about one-third the values in residences reported in the same study. Power-frequency electric fields near video display terminals

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(VTDs) are about 10 V/m, similar to those of other appliances (Harvey, 1983). Electric-field levels in public buildings such as shops, offices, and malls appear to be comparable with levels in residences.

In a survey of 1,882 volunteers from utilities, electric-field exposures were measured for 2,082 work days and 657 non-work days (Bracken, 1990). Electric-field exposures for occupations other than those directly related to high-voltage equipment were equivalent to those for non-work exposure.

Thus, except for the relatively few occupations where high-voltage sources are prevalent, electric fields encountered in the workplace are probably similar to those of residential exposures. Even in electric-utility occupations where high field sources are present, exposures to high fields are limited on average to minutes per day.

Electric fields found in publicly accessible areas near high-voltage transmission lines can typically range up to 3 kV/m for 230-kV lines, to 10 kV/m for 500-kV lines, and to 12 kV/m for 765-kV lines. Although these peak levels are considerably higher than the levels found in other public areas, they are present only in limited areas on rights-of-way.

The calculated electric fields for the proposed McNary – John Day 500-kV transmission line are consistent with the levels reported for other 500-kV transmission lines in Oregon, Washington, and elsewhere. The calculated electric fields on the right-of-way of the proposed transmission line would be much higher than levels normally encountered in residences and offices.

4.0 Magnetic Field

4.1 Basic Concepts

Magnetic fields can be characterized by the force they exert on a moving charge or on an electrical current. As with the electric field, the magnetic field is a vector quantity characterized by both magnitude and direction. Electrical currents generate magnetic fields. In the case of transmission lines, distribution lines, house wiring, and appliances, the 60-Hz electric current flowing in the conductors generates a time-varying, 60-Hz magnetic field in the vicinity of these sources. The strength of a magnetic field is measured in terms of magnetic lines of force per unit area, or magnetic flux density. The term “magnetic field,” as used here, is synonymous with magnetic flux density and is expressed in units of Gauss (G) or milligauss (mG).

The uniformity of a magnetic field depends on the nature and proximity of the source, just as the uniformity of an electric field does. Transmission-line-generated magnetic fields are quite uniform over horizontal and vertical distances of several feet near the ground. However, for small sources such as appliances, the magnetic field decreases rapidly over distances comparable with the size of the device.

The interaction of a time-varying magnetic field with conducting objects results in induced electric field and currents in the object. A changing magnetic field through an area generates a voltage around any conducting loop enclosing the area (Faraday's law). This is the physical basis for the operation of an electrical transformer. For a time-varying sinusoidal magnetic field, the magnitude of the induced voltage around the loop is proportional to the area of the loop, the frequency of the field, and the magnitude of the field. The induced voltage around the loop results in an induced electric field and current flow in the loop material. The induced current that flows in the loop depends on the conductivity of the loop.

4.2 Transmission-line Magnetic Fields

The magnetic field generated by currents on transmission-line conductors extends from the conductors through the air and into the ground. The magnitude of the field at a height of 3.28 ft. (1 m) is frequently used to describe the magnetic field under transmission lines. Because the magnetic field is not affected by non-ferrous materials, the field is not influenced by normal objects on the ground under the line. The direction of the maximum field varies with location. (The electric field, by contrast, is essentially vertical near the ground.) The most important transmission-line parameters that determine the magnetic field at 3.28 ft. (1 m) height are conductor height above ground and magnitude of the currents flowing in the conductors. As distance from the transmission-line conductors increases, the magnetic field decreases.

Calculations of magnetic fields from transmission lines are performed using well-known physical principles (cf., Deno and Zaffanella, 1982). The calculated values usually represent the ideal straight parallel-conductor configuration. For simplicity, a flat earth is usually assumed. Balanced currents (currents of the same magnitude for each phase) are also assumed. This is usually valid for transmission lines, where loads on all three phases are maintained in balance during operation. Induced image currents in the earth are usually ignored for calculations of magnetic field under or near the right-of-way. The resulting error is negligible. Only at distances greater than 300 ft. (91 m) from a line do such contributions become significant (Deno and Zaffanella, 1982). The clearance for magnetic-field calculations for the proposed line was the same as that used for electric-field evaluations.

Standard techniques for measuring magnetic fields near transmission lines are described in ANSI IEEE Standard No. 644-1987 (IEEE, 1987). Measured magnetic fields agree well with calculated values, provided the currents and line heights that go into the calculation correspond to the actual values for the line. To realize such agreement, it is necessary to get accurate current readings during field measurements (because currents on transmission lines can vary considerably over short periods of time) and also to account for all field sources in the vicinity of the measurements.

As with electric fields, the maximum or peak magnetic fields occur in areas near the centerline and at midspan where the conductors are the lowest. The magnetic field at the edge of the right-of-way is not very dependent on line height. If more than one line is present, the peak field will depend on the relative electrical phasing of the conductors and the direction of power flow.

4.3 Calculated Values for Magnetic Fields

Table 4 gives the calculated values of the magnetic field at 3.28 ft. (1 m) height for the proposed 500-kV transmission line configurations. Field values on the right-of-way and at the edge of the right-of-way are given for projected maximum currents during system annual peak load in 2004, for minimum and average conductor clearances. The maximum currents are 1758 A on each of the three phases of the proposed line. The actual magnetic-field levels would vary, as currents on the lines change daily and seasonally and as ambient temperature changes. Average currents over the year would be about 50% of the maximum values. The levels shown in the figures represent the highest magnetic fields expected for the proposed McNary – John Day 500-kV line. Average fields over a year would be considerably reduced from the peak values, as a result of increased clearances above the minimum value and reduced currents from the maximum value.

Figure 3 shows lateral profiles of the magnetic field under maximum current and minimum clearance conditions for configurations of the proposed 500-kV transmission line. A field profile for average

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height under Configuration 3 is also included in Figure 3c. Maximum field levels for the existing configurations are also shown in Figure 3.

For the proposed 500-kV line, the maximum calculated 60-Hz magnetic field expected at 3.28 ft. (1 m) above ground is 311 mG. This field is calculated for the maximum current of 1758 A, with the conductors at a height of 35 ft. (10.7 m). The maximum field would decrease for increased conductor clearance. For an average conductor height over a span of 45 ft. (13.7 m), the maximum field would be 216 mG. Maximum fields under the proposed line in the configuration with no immediately adjacent parallel lines would be slightly less than these values.

The magnetic field at the edge of the right-of-way depends on the width of the right-of-way which varies considerably for the proposed line. For maximum current conditions the calculated magnetic field at the edge of the right-of-way varies from 89 mG to 16 mG as the center line to edge of right-of-way distance varies from 72.5 ft. to 175 ft. The field at the edge of the right-of-way adjacent to a parallel line would depend on that line.

The magnetic field falls off rapidly as distance from the line increases. At a distance of 225 ft. (69 m) from the centerline of the proposed line with no parallel lines, the field would be less than 10 mG for maximum current conditions.

For the existing lines, the peak magnetic fields on the rights-of-way are 327 mG and 298 mG, for the 500-kV and 230-kV lines, respectively. The peak value of 327 mG occurs under the existing Hanford – John Day 500-kV line. Fields at the edges of the existing rights-of-way range from 84 mG for the McNary – Horse Heaven 230-kV line to 9 mG for the Hanford – John Day 500-kV line which is 220 ft. from the edge of the right-of-way.

4.4 Environmental Magnetic Fields

Transmission lines are not the only source of magnetic fields; as with 60-Hz electric fields, 60-Hz magnetic fields are present throughout the environment of a society that relies on electricity as a principal energy source. The magnetic fields associated with the proposed McNary – John Day 500-kV line can be compared with fields from other sources. The range of 60-Hz magnetic-field exposures in publicly accessible locations such as open spaces, transmission-line rights-of-way, streets, pedestrian walkways, parks, shopping malls, parking lots, shops, hotels, public transportation, and so on range from less than 0.1 mG to about 1 G, with the highest values occurring near small appliances with electric motors. In occupational settings in electric utilities, where high currents are present, magnetic-field exposures for workers can be above 1 G. At 60 Hz, the magnitude of the natural magnetic field is approximately 0.0005 mG.

Several investigations of residential fields have been conducted. In a large study to identify and quantify significant sources of 60-Hz magnetic fields in residences, measurements were made in 996 houses, randomly selected throughout the country (Zaffanella, 1993). The most common sources of residential fields were power lines, the grounding system of residences, and appliances. Field levels were characterized by both point-in-time (spot) measurements and 24-hour measurements. Spot measurements averaged over all rooms in a house exceeded 0.6 mG in 50% of the houses and 2.9 mG in 5% of houses. Power lines generally produced the largest average fields in a house over a 24-hour period. On the other hand, grounding system currents proved to be a more significant source of the highest fields in a house. Appliances were found to produce the highest local fields; however, fields fell off rapidly with increased distance. For example, the median field near microwave ovens was 36.9 mG at a distance of 10.5 in (0.27 m) and 2.1 mG at 46 in (1.17 m). Across the entire sample of 996 houses, higher magnetic fields

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were found in, among others, urban areas (vs. rural); multi-unit dwellings (vs. single-family); old houses (vs. new); and houses with grounding to a municipal water system.

In an extensive measurement project to characterize the magnetic-field exposure of the general population, over 1000 randomly selected persons in the United States wore a personal exposure meter for 24 hours and recorded their location in a simple diary (Zaffanella and Kalton, 1998). Based on the measurements of 853 persons, the estimated 24-hour average exposure for the general population is 1.24 mG and the estimated median exposure is 0.88 mG. The average field “at home, not in bed” is 1.27 mG and “at home, in bed” is 1.11 mG. Average personal exposures were found to be largest “at work” (mean of 1.79 mG and median of 1.01 mG) and lowest “at home, in bed” (mean of 1.11 mG and median of 0.49 mG). Average fields in school were also low (mean of 0.88 mG and median of 0.69 mG). Factors associated with higher exposures at home were smaller residences, duplexes and apartments, metallic rather than plastic water pipes, and nearby overhead distribution lines.

As noted above, magnetic fields from appliances are localized and decrease rapidly with distance from the source. Localized 60-Hz magnetic fields have been measured near about 100 household appliances such as ranges, refrigerators, electric drills, food mixers, and shavers (Gauger, 1985). At a distance of 1 ft. (0.3 m), the maximum magnetic field ranged from 0.3 to 270 mG, with 95% of the measurements below 100 mG. Ninety-five percent of the levels at a distance of 4.9 ft. (1.5 m) were less than 1 mG. Devices that use light-weight, high-torque motors with little magnetic shielding exhibited the largest fields. These included vacuum cleaners and small hand-held appliances and tools. Microwave ovens with large power transformers also exhibited relatively large fields. Electric blankets have been a much-studied source of magnetic-field exposure because of the length of time they are used and because of the close proximity to the body. Florig and Hoburg (1988) estimated that the average magnetic field in a person using an electric blanket was 15 mG, and that the maximum field could be 100 mG. New "low-field" blankets have magnetic fields at least 10 times lower than those from conventional blankets (Bassen et al., 1991).

In a domestic magnetic-field survey, Silva et al. (1989) measured fields near different appliances at locations typifying normal use (e.g., sitting at an electric typewriter or standing at a stove). Specific appliances with relatively large fields included can openers (n = 9), with typical fields ranging from 30 to 225 mG and a maximum value up to 2.7 G; shavers (n = 4), with typical fields from 50 to 300 mG and maximum fields up to 6.9 G; and electric drills (n = 2), with typical fields from 56 to 190 mG and maximum fields up to 1.5 G. The fields from such appliances fall off very rapidly with distance and are only present for short periods. Thus, although instantaneous magnetic-field levels close to small hand-held appliances can be quite large, they do not contribute to average area levels in residences.

Although studies of residential magnetic fields have not all considered the same independent parameters, the following consistent characterization of residential magnetic fields emerges from the data:

- (1) External sources play a large role in determining residential magnetic-field levels. Transmission lines, when nearby, are an important external source. Unbalanced ground currents on neutral conductors and other conductors, such as water pipes in and near a house, can represent a significant source of magnetic field. Distribution lines per se, unless they are quite close to a residence, do not appear to be a traditional distance-dependent source.
- (2) Homes with overhead electrical service appear to have higher average fields than those with underground service.

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- (3) Appliances represent a localized source of magnetic fields that can be much higher than average or area fields. However, fields from appliances approach area levels at distances greater than 3.28 ft. (1 m) from the device.

Although important variables in determining residential magnetic fields have been identified, quantification and modeling of their influence on fields at specific locations is not yet possible. However, a general characterization of residential magnetic-field level is possible: average levels in the United States are in the range of 0.5 to 1.0 mG, with the average field in a small number of homes exceeding this range by as much as a factor of 10 or more. Average personal exposure levels are slightly higher, possibly due to use of appliances and varying distances to other sources. Maximum fields can be much higher.

Magnetic fields in commercial and retail locations are comparable with those in residences. As with appliances, certain equipment or machines can be a local source of higher magnetic fields. Utility workers who work close to transformers, generators, cables, transmission lines, and distribution systems clearly experience high-level fields. Other sources of fields in the workplace include motors, welding machines, computers, and video display terminals (VDTs). In publicly accessible indoor areas, such as offices and stores, field levels are generally comparable with residential levels, unless a high-current source is nearby.

Because high-current sources of magnetic field are more prevalent than high-voltage sources, occupational environments with relatively high magnetic fields encompass a more diverse set of occupations than do those with high electric fields. For example, in occupational magnetic-field measurements reported by Bowman et al. (1988), the geometric mean field from 105 measurements of magnetic field in "electrical worker" job locations was 5.0 mG. "Electrical worker" environments showed the following elevated magnetic-field levels (geometric mean greater than 20 mG): industrial power supplies, alternating current (ac) welding machines, and sputtering systems for electronic assembly. For secretaries in the same study, the geometric mean field was 3.1 mG for those using VDTs (n = 6) and 1.1 mG for those not using VDTs (n = 3).

Measurements of personal exposure to magnetic fields were made for 1,882 volunteer utility workers for a total of 4,411 workdays (Bracken, 1990). Median workday mean exposures ranged from 0.5 mG for clerical workers without computers to 7.2 mG for substation operators. Occupations not specifically associated with transmission and distribution facilities had median workday exposures less than 1.5 mG, while those associated with such facilities had median exposures above 2.3 mG. Magnetic-field exposures measured in homes during this study were comparable with those recorded in offices.

Magnetic fields in publicly accessible outdoor areas seem to be, as expected, directly related to proximity to electric-power transmission and distribution facilities. Near such facilities, magnetic fields are generally higher than indoors (residential). Higher-voltage facilities tend to have higher fields. Typical maximum magnetic fields in publicly accessible areas near transmission facilities can range from less than a few milligauss up to 300 mG or more, near heavily loaded lines operated at 230 to 765 kV. The levels depend on the line load, conductor height, and location on the right-of-way. Because magnetic fields near high-voltage transmission lines depend on the current in the line, they can vary daily and seasonally. To characterize fields from the distribution system, Heroux (1987) measured 60-Hz magnetic fields with a mobile platform along 140 mi. (223 km) of roads in Montreal. The median field level averaged over nine different routes was 1.6 mG, with 90% of the measurements less than about 5.1 mG. Spot measurements indicated that typical fields directly above underground distribution systems were 5 to 19 mG. Beneath overhead distribution lines, typical fields were 1.5 to 5 mG on the primary side of the

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transformer, and 4 to 10 mG on the secondary side. Near ground-based transformers used in residential areas, fields were 80 to 1000 mG at the surface and 10 to 100 mG at a distance of 1 ft. (0.3 m).

The magnetic fields from the proposed line would be comparable to or less than those from existing 500-kV lines in Oregon, Washington, and elsewhere. On and near the right-of-way of the proposed line, magnetic fields would be well above average residential levels. However, the fields from the line would decrease rapidly and approach common ambient levels at distances greater than a few hundred feet from the line. Furthermore, the fields at the edge of the right-of-way would not be above those encountered during normal activities near common sources such as hand-held appliances.

5.0 Electric and Magnetic Field (EMF) Effects

Possible effects associated with the interaction of EMF from transmission lines with people on and near a right-of-way fall into two categories: short-term effects that can be perceived and may represent a nuisance, and possible long-term health effects. Only short-term effects are discussed here. The issue of whether there are long-term health effects associated with transmission-line fields is controversial. In recent years, considerable research on possible biological effects of EMF has been conducted. A review of these studies and their implications for health-related effects is provided in a separate technical report for the environmental assessment for the proposed McNary – John Day 500-kV transmission line.

5.1 Electric Fields: Short-term Effects

Short-term effects from transmission-line electric fields are associated with perception of induced currents and voltages or perception of the field. Induced current or spark discharge shocks can be experienced under certain conditions when a person contacts objects in an electric field. Such effects occur in the fields associated with transmission lines that have voltages of 230-kV or higher. These effects could occur infrequently under the proposed McNary – John Day 500-kV line.

Steady-state currents are those that flow continuously after a person contacts an object and provides a path to ground for the induced current. The amplitude of the steady-state current depends on the induced current to the object in question and on the grounding path. The magnitude of the induced current to vehicles and objects under the proposed line will depend on the electric-field strength and the size and shape of the object. When an object is electrically grounded, the voltage on the object is reduced to zero, and it is not a source of current or voltage shocks. If the object is poorly grounded or not grounded at all, then it acquires some voltage relative to earth and is a possible source of current or voltage shocks.

The responses of persons to steady-state current shocks have been extensively studied, and levels of response documented (Keeseey and Letcher, 1969; IEEE, 1978). Primary shocks are those that can result in direct physiological harm. Such shocks will not be possible from induced currents under the existing or proposed lines, because clearances above ground required by the NESC preclude such shocks from large vehicles and grounding practices eliminate large stationary objects as sources of such shocks.

Secondary shocks are defined as those that could cause an involuntary and potentially harmful movement, but no direct physiological harm. Secondary shocks could occur under the proposed 500-kV line when making contact with ungrounded conducting objects such as vehicles or equipment. However, such occurrences are anticipated to be very infrequent. Shocks, when they occur under the 500-kV line, are most likely to be below the nuisance level. Induced currents are extremely unlikely to be perceived off the right-of-way of the proposed line.

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Induced currents are always present in electric fields under transmission lines and will be present near the proposed line. However, during initial construction, BPA routinely grounds metal objects that are located on or near the right-of-way. The grounding eliminates these objects as sources of induced current and voltage shocks. Multiple grounding points are used to provide redundant paths for induced current flow. After construction, BPA would respond to any complaints and install or repair grounding to mitigate nuisance shocks.

Unlike fences or buildings, mobile objects such as vehicles and farm machinery cannot be grounded permanently. Limiting the possibility of induced currents from such objects to persons is accomplished in several ways. First, required clearances for above-ground conductors tend to limit field strengths to levels that do not represent a hazard or nuisance. The NESC (IEEE, 2002) requires that, for lines with voltage exceeding 98 kV line-to-ground (170 kV line-to-line), sufficient conductor clearance be maintained to limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 milliamperes (mA) or less. This can be accomplished by limiting access or by increasing conductor clearances in areas where large vehicles could be present. BPA and other utilities design and operate lines to be in compliance with the NESC.

For the proposed line, conductor clearances (50°C conductor temperature) would be increased to at least 54 ft. (16.5 m) over major road crossings along the route, resulting in a maximum field of 4.4 kV/m or less at the 3.28 ft. (1 m) height. The largest truck allowed on roads in Oregon and Washington without a special permit is 14 ft. high by 8.5 ft. wide by 75 ft. long (4.3 x 2.6 x 22.9 m). The induced currents to such a vehicle oriented perpendicular to the line in a maximum field of 4.2 kV/m (at 3.28-ft. height) would be less than 4.0 mA (Reilly, 1979). For smaller trucks, the maximum induced currents for perpendicular orientation to the proposed line would be less than this value. (Larger special-permitted trucks, such as triple trailers, can be up to 105 feet in length. However, because they average the field over such a long distance, the maximum induced current to a 105-ft. vehicle oriented perpendicular to the 500-kV line at a road crossing would be less than 3.8 mA.) Thus, the NESC 5-mA criterion would be met for perpendicular road crossings of the proposed line. These large vehicles are not anticipated to be off highways or oriented parallel to the proposed line. As discussed below, these are worst-case estimates of induced currents at road crossings; conditions for their occurrence are rare. The conductor clearance at each road crossing would be checked during the design stage of the line to ensure that the NESC 5-mA criterion is met. Furthermore, it is BPA policy to limit the maximum induced current from vehicles to 2 mA in commercial parking lots. Line clearances would also be increased in accordance with the NESC, such as over railroads and water areas suitable for sailboating.

Several factors tend to reduce the levels of induced current shocks from vehicles:

- (1) Activities are distributed over the whole right-of-way, and only a small percentage of time is spent in areas where the field is at or close to the maximum value.
- (2) At road crossings, vehicles are aligned perpendicular to the conductors, resulting in a substantial reduction in induced current.
- (3) The conductor clearance at road crossings may not be at minimum values because of lower conductor temperatures and/or location of the road crossing away from midspan.
- (4) The largest vehicles are permitted only on certain highways.
- (5) Off-road vehicles are in contact with soil or vegetation, which reduces shock currents substantially.

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Induced voltages occur on objects, such as vehicles, in an electric field where there is an inadequate electrical ground. If the voltage is sufficiently high, then a spark discharge shock can occur as contact is made with the object. Such shocks are similar to "carpet" shocks that occur, for example, when a person touches a doorknob after walking across a carpet on a dry day. The number and severity of spark discharge shocks depend on electric-field strength. Based on the low frequency of complaints reported by Glasgow and Carstensen (1981) for 500-kV alternating current transmission lines (one complaint per year for each 1,500 mi. or 2400 km of 500-kV line), nuisance shocks, which are primarily spark discharges, do not appear to be a serious impediment to normal activities under 500-kV lines.

In electric fields higher than will occur under the proposed line, it is theoretically possible for a spark discharge from the induced voltage on a large vehicle to ignite gasoline vapor during refueling. The probability for exactly the right conditions for ignition to occur is extremely remote. The additional clearance of conductors provided at road crossings reduces the electric field in areas where vehicles are prevalent and reduces the chances for such events. Even so, BPA recommends that vehicles should not be refueled under the proposed line unless specific precautions are taken to ground the vehicle and the fueling source (USDOE, 1995).

Under certain conditions, the electric field can be perceived through hair movement on an upraised hand or arm of a person standing on the ground under high-voltage transmission lines. The median field for perception in this manner was 7 kV/m for 136 persons; only about 12% could perceive fields of 2 kV/m or less (Deno and Zaffanella, 1982). In areas under the conductors at midspan, the fields at ground level would exceed the levels where field perception normally occurs. In these instances, field perception could occur on the right-of-way of the proposed line. It is unlikely that the field would be perceived beyond the edge of the right-of-way. Where vegetation provides shielding, the field would not be perceived.

Conductive shielding reduces both the electric field and induced effects such as shocks. Persons inside a vehicle cab or canopy are shielded from the electric field. Similarly, a row of trees or a lower-voltage distribution line reduces the field on the ground in the vicinity. Metal pipes, wiring, and other conductors in a residence or building shield the interior from the transmission-line electric field.

The electric fields from the proposed 500-kV line would be comparable to those from existing 500-kV lines in the project area and elsewhere. Potential impacts of electric fields can be mitigated through grounding policies, adherence to the NESC, and increased clearances above the minimums specified by the NESC. Worst-case levels are used for safety analyses but, in practice, induced currents and voltages are reduced considerably by unintentional grounding. Shielding by conducting objects, such as vehicles and vegetation, also reduces the potential for electric-field effects.

5.2 Magnetic Field: Short-term Effects

Magnetic fields associated with transmission and distribution systems can induce voltage and current in long conducting objects that are parallel to the transmission line. As with electric-field induction, these induced voltages and currents are a potential source of shocks. A fence, irrigation pipe, pipeline, electrical distribution line, or telephone line forms a conducting loop when it is grounded at both ends. The earth forms the other portion of the loop. The magnetic field from a transmission line can induce a current to flow in such a loop if it is oriented parallel to the line. If only one end of the fence is grounded, then an induced voltage appears across the open end of the loop. The possibility for a shock exists if a person closes the loop at the open end by contacting both the ground and the conductor. The magnitude of this potential shock depends on the following factors: the magnitude of the field; the length of the object (the longer the object, the larger the induced voltage); the orientation of the object with

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respect to the transmission line (parallel as opposed to perpendicular, where no induction would occur); and the amount of electrical resistance in the loop (high resistance limits the current flow).

Magnetically induced currents from power lines have been investigated for many years; calculation methods and mitigating measures are available. A comprehensive study of gas pipelines near transmission lines developed prediction methods and mitigation techniques specifically for induced voltages on pipelines (Dabkowski and Taflove, 1979; Taflove and Dabkowski, 1979). Similar techniques and procedures are available for irrigation pipes and fences. Grounding policies employed by utilities for long fences reduce the potential magnitude of induced voltage.

The magnitude of the coupling with both pipes and fences is very dependent on the electrical unbalance (unequal currents) among the three phases of the line. Thus, a distribution line where a phase outage may go unnoticed for long periods of time can represent a larger source of induced currents than a transmission line where the loads are well-balanced (Jaffa and Stewart, 1981).

Knowledge of the phenomenon, grounding practices, and the availability of mitigation measures mean that magnetic-induction effects from the proposed 500-kV transmission line will be minimal. In addition, the proposed line would be located in an existing corridor where mitigation measures will have already been implemented for the existing lines.

Magnetic fields from transmission and distribution facilities can interfere with certain electronic equipment. Magnetic fields can cause distortion of the image on VDTs and computer monitors. The threshold field for interference depends on the type and size of monitor and the frequency of the field. Interference has been observed for certain monitors at fields at or below 10 mG (Baishiki et al., 1990; Banfai et al., 2000). Generally, the problem arises when computer monitors are in use near electrical distribution facilities in large office buildings. Fields from the proposed line would fall below this level at approximately 225 ft. (69 m) from the centerline.

Interference from magnetic fields can be eliminated by shielding the affected monitor or moving it to an area with lower fields. Similar mitigation methods could be applied to other sensitive electronics, if necessary. Interference from 60-Hz fields with computers and control circuits in vehicles and other equipment is not anticipated at the field levels found under and near the proposed 500-kV transmission line.

The magnetic fields from the proposed line would be comparable to those from existing 500-kV lines in the area of the proposed line.

6.0 Regulations

Regulations that apply to transmission-line electric and magnetic fields fall into two categories. Safety standards or codes are intended to limit or eliminate electric shocks that could seriously injure or kill persons. Field limits or guidelines are intended to limit electric- and magnetic-field exposures that can cause nuisance shocks or might cause health effects. In no case has a limit or standard been established because of a known or demonstrated health effect.

The proposed line would be designed to meet the NESC (IEEE, 2002), which specifies how far transmission-line conductors must be from the ground and other objects. The clearances specified in the code provide safe distances that prevent harmful shocks to workers and the public. In addition, people who live and work near transmission lines must be aware of safety precautions to avoid electrical (which

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is not necessarily physical) contact with the conductors. For example, farmers should not up-end irrigation pipes under a transmission or other electrical line or direct the water stream from an irrigation system into or near the conductors. In addition, as a matter of safety, the NESC specifies that electric-field-induced currents from transmission lines must be below the 5 mA (“let go”) threshold deemed a lower limit for primary shock. BPA publishes and distributes a brochure that describes safe practices to protect against shock hazards around power lines (USDOE, 1995).

Field limits or guidelines have been adopted in several states and countries and by national and international organizations. Electric-field limits have generally been based on minimizing nuisance shocks or field perception. The intent of magnetic-field limits has been to limit exposures to existing levels, given the uncertainty of their potential for health effects.

There are currently no national standards in the United States for 60-Hz electric and magnetic fields. Oregon's formal rule in its transmission-line-siting procedures specifically addresses field limits. The Oregon limit of 9 kV/m for electric fields is applied to areas accessible to the public (Oregon, State of, 1980). The Oregon rule also addresses grounding practices, audible noise, and radio interference. Oregon does not have a limit for magnetic fields from transmission lines. The state of Washington does not have guidelines for electric or magnetic fields from transmission lines.

Besides Oregon, several states have been active in establishing mandatory or suggested limits on 60-Hz electric and (in two cases) magnetic fields. Five other states have specific electric-field limits that apply to transmission lines: Florida, Minnesota, Montana, New Jersey, and New York. Florida and New York have established regulations for magnetic fields. These regulations are summarized in Table 5, adapted from TDHS Report (1989).

Government agencies and utilities operating transmission systems have established design criteria that include EMF levels. BPA has maximum allowable electric fields of 9 and 5 kV/m on and at the edge of the right-of-way, respectively (USDOE, 1996). BPA also has maximum-allowable electric field strengths of 5 kV/m, 3.5 kV/m, and 2.5 kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively. These levels are based on limiting the maximum short-circuit currents from anticipated vehicles to less than 1 mA in shopping center lots and to less than 2 mA in commercial parking lots.

Electric-field limits for overhead power lines have also been established in other countries (Maddock, 1992). Limits for magnetic fields from overhead power lines have not been explicitly established anywhere except in Florida and New York (see Table 5). However, general guidelines and limits on EMF have been established for occupational and public exposure in several countries and by national and international organizations.

The American Conference of Governmental Industrial Hygienists (ACGIH) sets guidelines (Threshold Limit Values or TLV) for occupational exposures to environmental agents (ACGIH, 2000). In general, a TLV represents the level below which it is believed that nearly all workers may be exposed repeatedly without adverse health effects. For EMF, the TLVs represent ceiling levels. For 60-Hz electric fields, occupational exposures should not exceed the TLV of 25 kV/m. However, the ACGIH also recognizes the potential for startle reactions from spark discharges and short-circuit currents in fields greater than 5-7 kV/m, and recommends implementing grounding practices. They recommend the use of conductive clothing for work in fields exceeding 15 kV/m. The TLV for occupational exposure to 60-Hz magnetic fields is a ceiling level of 10 G (10,000 mG) (ACGIH, 2000).

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Electric and magnetic fields from various sources (including automobile ignitions, appliances and, possibly, transmission lines) can interfere with implanted cardiac pacemakers. In light of this potential problem, manufacturers design devices to be immune from such interference. However, research has shown that these efforts have not been completely successful and that a few models of pacemakers could be affected by 60-Hz fields from transmission lines. There were also numerous models of pacemakers that were not affected by fields even larger than those found under transmission lines. Because of the known potential for interference with pacemakers by 60-Hz fields, field limits for pacemaker wearers have been established by the ACGIH. They recommend that wearers of pacemakers and similar medical-assist devices limit their exposure to electric fields of 1 kV/m or less and to magnetic fields to 1 G (1,000 mG) or less (ACGIH, 2000).

The International Committee on Non-ionizing Radiation Protection (ICNIRP), working in cooperation with the World Health Organization (WHO), has developed guidelines for occupational and public exposures to EMF (ICNIRP, 1998). For occupational exposures at 60 Hz, the recommended limits to exposure are 8.3 kV/m for electric fields and 4.2 G (4,200 mG) for magnetic fields. The electric-field level can be exceeded, provided precautions are taken to prevent spark discharge and induced current shocks. For the general public, the ICNIRP guidelines recommend exposure limits of 4.2 kV/m for electric fields and 0.83 G (830 mG) for magnetic fields (ICNIRP, 1998).

ICNIRP has also established guidelines for contact currents, which could occur when a grounded person contacts an ungrounded object in an electric field. The guideline levels are 1.0 mA for occupational exposure and 0.5 mA for public exposure.

The electric fields from the proposed 500-kV line would meet the ACGIH standards, provided wearers of pacemakers and similar medical-assist devices are discouraged from unshielded right-of-way use. (A passenger in an automobile under the line would be shielded from the electric field.) The electric fields in limited areas on the right-of-way would exceed the ICNIRP guideline for public exposure. The magnetic fields from the proposed line would be below the ACGIH limits, as well as below those of ICNIRP. The electric fields present on the right-of-way could induce currents in ungrounded vehicles that exceeded the ICNIRP level of 0.5 mA.

The estimated peak electric fields on the right-of-way of the proposed transmission line would meet the Oregon limit as well as those set in Florida and New York, but not those of Minnesota and Montana (see Table 5). The BPA maximum allowable electric field-limit would be met for all configurations of the proposed line. The edge-of-right-of-way electric fields from the proposed line would be below limits set in New Jersey, but above those in Florida, Montana, and New York.

The magnetic field at the edge of the right-of-way from the proposed line would be below the regulatory levels of states where such regulations exist.

7.0 Audible Noise

7.1 Basic Concepts

Audible noise (AN), as defined here, represents an unwanted sound, as from a transmission line, transformer, airport, or vehicle traffic. Sound is a pressure wave caused by a sound source vibrating or displacing air. The ear converts the pressure fluctuations into auditory sensations. AN from a source is superimposed on the background or ambient noise that is present before the source is introduced.

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The amplitude of a sound wave is the incremental pressure resulting from sound above atmospheric pressure. The sound-pressure level is the fundamental measure of AN; it is generally measured on a logarithmic scale with respect to a reference pressure. The sound-pressure level (SPL) in decibels (dB) is given by:

$$\text{SPL} = 20 \log (P/P_0)\text{dB}$$

where P is the effective rms (root-mean-square) sound pressure, P_0 is the reference pressure, and the logarithm (log) is to the base 10. The reference pressure for measurements concerned with hearing is usually taken as 20 micropascals (Pa), which is the approximate threshold of hearing for the human ear. A logarithmic scale is used to encompass the wide range of sound levels present in the environment. The range of human hearing is from 0 dB up to about 140 dB, a ratio of 10 million in pressure (EPA, 1978).

Logarithmic scales, such as the decibel scale, are not directly additive: to combine decibel levels, the dB values must be converted back to their respective equivalent pressure values, the total rms pressure level found, and the dB value of the total recalculated. For example, adding two sounds of equal level on the dB scale results in a 3 dB increase in sound level. Such an increase in sound pressure level of 3 dB, which corresponds to a doubling of the energy in the sound wave, is barely discernible by the human ear. It requires an increase of about 10 dB in SPL to produce a subjective doubling of sound level for humans. The upper range of hearing for humans (140 dB) corresponds to a sharply painful response (EPA, 1978).

Humans respond to sounds in the frequency range of 16 to 20,000 Hz. The human response depends on frequency, with the most sensitive range roughly between 2000 and 4000 Hz. The frequency-dependent sensitivity is reflected in various weighting scales for measuring audible noise. The A-weighted scale weights the various frequency components of a noise in approximately the same way that the human ear responds. This scale is generally used to measure and describe levels of environmental sounds such as those from vehicles or occupational sources. The A-weighted scale is also used to characterize transmission-line noise. Sound levels measured on the A-scale are expressed in units of dB(A) or dBA.

AN levels and, in particular, corona-generated audible noise (see below) vary in time. In order to account for fluctuating sound levels, statistical descriptors have been developed for environmental noise. Exceedence levels (L levels) refer to the A-weighted sound level that is exceeded for a specified percentage of the time. Thus, the L_5 level refers to the noise level that is exceeded only 5% of the time. L_{50} refers to the sound level exceeded 50% of the time. Sound-level measurements and predictions for transmission lines are often expressed in terms of exceedence levels, with the L_5 level representing the maximum level and the L_{50} level representing a median level.

Table 6 shows AN levels from various common sources. Clearly, there is wide variation. Noise exposure depends on how much time an individual spends in different locations. Outdoor noise generally does not contribute to indoor levels (EPA, 1974). Activities in a building or residence generally dominate interior AN levels. The amount of sound attenuation (reduction) provided by buildings is given in Table 7. Assuming that residences along the line route fall in the "warm climate, windows open" category, the typical sound attenuation provided by a house is about 12 dBA.

The BPA design criterion for corona-generated audible noise (L_{50} , foul weather) is 50 ± 2 dBA at the edge of the ROW (Perry, 1982). This criterion has been interpreted by the state and BPA to meet Oregon Noise Control Regulations (Perry, 1982). The Washington Administrative Code provides noise limitations by class of property, residential, commercial or industrial (Washington, State of, 1975). Transmission lines are classified as industrial and may cause a maximum permissible noise level of 60 dBA to intrude into residential property. During nighttime hours (10:00 p.m. to 7:00 a.m.), the

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maximum permissible limit for noise from industrial to residential areas is reduced to 50 dBA. This latter level applies to transmission lines that operate continuously. The state of Washington Department of Ecology accepts the 50 dBA level at the edge of the right-of-way for transmission lines, but encouraged BPA to design lines with lower audible noise levels (WDOE, 1981).

The EPA has established a guideline of 55 dBA for the annual average day-night level (L_{dn}) in outdoor areas (EPA, 1978). In computing this value, a 10 dB correction (penalty) is added to night-time noise between the hours of 10 p.m. and 7 a.m.

7.2 Transmission-line Audible Noise

Corona is the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that, under certain conditions, is accompanied by a 120-Hz hum. Corona-generated audible noise is of concern primarily for con-temporary lines operating at voltages of 345 kV and higher during foul weather. The proposed 500-kV line will produce some noise under foul weather conditions.

The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, protrusions on the conductor surface—particularly water droplets on or dripping off the conductors—cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. Wet conductors can occur during periods of rain, fog, snow, or icing. Based on meteorologic records near the route of the proposed transmission line, such conditions are expected to occur only about 1% of the time during the year.

For a few months after line construction, residual grease or oil on the conductors can cause water to bead up on the surface. This results in more corona sources and slightly higher levels of audible noise and electromagnetic interference if the line is energized. However, the new conductors "age" in a few months, and the level of corona activity decreases to the predicted equilibrium value. During fair weather, insects and dust on the conductor can also serve as sources of corona. The proposed line has been designed with three 1.3-inch (3.30-cm) diameter conductors per phase, which will yield acceptable corona levels.

7.3 Predicted Audible Noise Levels

Audible noise levels are calculated for average voltage and average conductor heights for fair- and foul-weather conditions. The predicted levels of corona-generated audible noise for the proposed line operated at a voltage of 540 kV are given in Table 8 and plotted in Figure 4 for the proposed configurations. For comparison, Table 8 also gives the calculated levels for the existing parallel lines.

The calculated median level (L_{50}) during foul weather 75 feet from the centerline of the proposed McNary – John Day right-of-way with no parallel lines is 47 dBA; the calculated maximum level (L_5) during foul weather at this location is 51 dBA. These levels are comparable with levels at the edges of some existing 500-kV lines in Oregon and Washington and lower than the levels from the existing Hanford – John Day 500-kV line in the corridor. However, for all the proposed configurations the resulting AN levels are higher than these because of contributions from existing lines.

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For the configurations with immediately adjacent parallel lines (Configurations 1, 2 and 4), the foul weather L_{50} AN level at the edge of the right-of-way adjacent to the proposed line would be 49 to 54 dBA. In these cases, AN from the existing parallel 345-kV and/or 500-kV lines is comparable to or greater than that from the proposed line; and the proposed line would add 4 dBA or less to existing noise levels at the proposed edge of the right-of-way. Such an increase would be barely discernible. Even for Configuration 3 where the proposed line would be more than 600 feet from the existing 345-kV line, the proposed line would add only about 6 dBA to existing levels. At the edge of the right-of-way adjacent to the existing lines in the corridor, the foul weather L_{50} AN level would change 1 dBA or less with the addition of the proposed line.

During fair-weather conditions, which occur about 99% of the time, audible noise levels at the edge of the right-of-way would be about 20 dBA lower than the foul weather levels (if corona were present). These lower levels could be masked by ambient noise on and off the right-of-way.

7.4 Discussion

The calculated foul-weather corona noise levels for the proposed line with no parallel lines would be comparable to, or less, than those from existing 500-kV lines in Oregon and Washington. During fair weather, noise from the conductors might be perceivable on the right-of-way, but beyond the right-of-way it would likely be masked or so low as not to be perceived, even during foul weather when ambient noise is higher.

Where the proposed line parallels the existing lines, the increase of less than 4 dBA due to the addition of the proposed line would barely be discernible at the edge of the right of-way and beyond. The level at the edge of the right-of-way of the existing lines would be the same, whether the proposed line were present or not.

No transformers are being added to the existing McNary and John Day Substations. Noise from the existing substation equipment and transmission lines would remain the primary source of environmental noise at these locations. The large-diameter tubular conductors in the station do not generate corona noise during fair weather and any noise generated during foul weather would be masked by noise from the transmission lines entering and leaving the station. During foul weather the noise from the proposed and existing lines would mask the substation noise at the outer edges of the rights-of-way.

Off the right-of-way, the levels of audible noise from the proposed line during foul weather would be below the 55 dBA level that can produce interference with speech outdoors. Since residential buildings provide significant sound attenuation (-12 dBA with windows open; -24 dBA with windows closed), the noise levels off the right-of-way would be well below the 45 dBA level required for interference with speech indoors and below the 35 dBA level where sleep interference can occur (EPA, 1973; EPA, 1978). Since corona is a foul-weather phenomenon, people tend to be inside with windows possibly closed, providing additional attenuation when corona noise is present. In addition, ambient noise levels can be high during such periods (due to rain hitting foliage or buildings), and can mask corona noise.

The 47-dBA level for the proposed line would meet the BPA design criterion and, hence, the Oregon regulations and the Washington Administrative Code limits for transmission lines. Noise levels at the edges of the rights-of-way of the existing McNary – Ross 345-kV and Hanford – John Day 500-kV lines (not shown in Table 8) exceed the limits of both Oregon and Washington and presumably are allowed because of the ages of the lines.

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The computed annual L_{dn} level for transmission lines operating in areas with about 1% foul weather is about $L_{dn} = L_{50} - 6$ dB (Bracken, 1987). Therefore, assuming such conditions in the area of the proposed McNary – John Day 500-kV line, the estimated L_{dn} at the edge of the right-of-way would be approximately 48 dBA or less, which is well below the EPA L_{dn} guideline of 55 dBA.

7.5 Conclusion

Along the proposed line route where no parallel lines are within 600 feet, there would be increases in the perceived noise above ambient levels during foul weather at the edges of the right-of-way. Where the proposed line parallels the existing 345-kV or 500-kV lines, the incremental noise contributed by the proposed line would be less than 4 dBA at the edge of the proposed new right-of-way and beyond, and would probably not be discernible from existing noise levels.

The corona-generated noise during foul weather would be masked to some extent by naturally occurring sounds such as wind and rain on foliage. During fair weather, the noise off the right-of-way from the proposed line would probably not be detectable above ambient levels. The noise levels from the proposed line would be below levels identified as causing interference with speech or sleep. The audible noise from the transmission line would be below EPA guideline levels and would meet the BPA design criterion that complies with the Oregon and Washington state noise regulations.

8.0 Electromagnetic Interference

8.1 Basic Concepts

Corona on transmission-line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. The noise can cause radio and television interference (RI and TVI). In certain circumstances, corona-generated electromagnetic interference (EMI) can also affect communications systems and other sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345 kV or higher. This is especially true of interference with television signals. The bundle of three 1.3-in. diameter conductors used in the design of the proposed 500-kV line would mitigate corona generation and thus keep radio and television interference levels at acceptable levels.

Spark gaps on distribution lines and on low-voltage wood-pole transmission lines are a more common source of RI/TVI than is corona from high-voltage electrical systems. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires. The proposed transmission line would be constructed with modern hardware that eliminates such problems and therefore minimizes gap noise. Consequently, this source of EMI is not anticipated for the proposed line.

No state has limits for either RI or TVI. In the United States, electromagnetic interference from power transmission systems is governed by the Federal Communications Commission (FCC) Rules and Regulations presently in existence (FCC, 1988). A power transmission system falls into the FCC category of "incidental radiation device," which is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." For purposes of these regulations, harmful interference is defined as: "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades,

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obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (FCC, 1988: Vol II, part 15. 47CFR, Ch. 1).

Electric power companies have been able to work quite well under the present FCC rule because harmful interference can generally be eliminated. It has been estimated that more than 95% of power-line sources that cause interference are due to gap-type discharges. These can be found and completely eliminated, when required to prevent interference (USDOE, 1980). Complaints related to corona-generated interference occur infrequently. This is especially true with the advent of cable television and satellite television, which are not subject to corona-generated interference. Mitigation of corona-generated interference with conventional radio and television receivers can be accomplished in several ways, such as use of a directional antenna or relocation of an existing antenna (USDOE, 1977; USDOE, 1980; Loftness et al., 1981).

8.2 Radio Interference (RI)

Radio reception in the AM broadcast band (535 to 1605 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near to transmission lines can be affected by RI. The IEEE Radio Noise Design Guide identifies an acceptable limit of fair-weather RI as expressed in decibels above 1 microvolt per meter (dB μ V/m) of about 40 dB μ V/m at 100 ft. (30 m) from the outside conductor (IEEE Committee Report, 1971). As a general rule, average levels during foul weather (when the conductors are wet) are 16 to 22 dB μ V/m higher than average fair-weather levels.

8.3 Predicted RI Levels

Table 9 gives the predicted fair- and foul-weather RI levels (1000 kHz) at 100 ft. (30 m) from the outside conductor for the proposed 500-kV line in the four configurations. Median foul-weather levels would be about 17 dB higher than the fair-weather levels. The predicted L₅₀ fair-weather level at the edge of the proposed right-of-way with no parallel lines is 45 dB μ V/m for 540-kV line operation; at 100 ft. (30 m) from the outside conductor, the level is 36 dB μ V/m. Predictions indicate that fair-weather RI will meet the IEEE 40 dB μ V/m criterion at distances greater than about 100 ft. (30 m) from the outside conductor of the proposed line in all configurations. Predicted fair-weather L₅₀ levels are comparable with those for the existing 345-kV line and lower than that from the existing 500-kV Hanford – John Day 500-kV line (45 dB μ V/m at 100 ft. [30 m]).

8.4 Television Interference (TVI)

Corona-caused TVI occurs during foul weather and is generally of concern for transmission lines with voltages of 345 kV or above, and only for conventional receivers within about 600 ft. (183 m) of a line. As is the case for RI, gap sources on distribution and low-voltage transmission lines are the principal observed sources of TVI. The use of modern hardware and construction practices for the proposed line would minimize such sources.

8.5 Predicted TVI Levels

Table 10 shows TVI levels predicted at 100 ft. (30 m) from the outside conductor of the proposed line operating at 540 kV and from existing lines. At this distance, the foul-weather TVI level (75 megahertz (MHz)) predicted for the proposed line is 23 to 24 dB μ V/m for all configurations. This is comparable with TVI levels from the existing 345-kV line and some other existing BPA 500-kV lines, and lower than

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that from the existing Hanford – John Day 500-kV line (33 dB μ V/m at 100 ft. [30 m] from the outside conductor).

There is a potential for interference with television signals at locations very near the proposed line in fringe reception areas. However, several factors reduce the likelihood of occurrence. Corona-generated TVI occurs only in foul weather; consequently, signals would not be interfered with most of the time, which is characterized by fair weather. Because television antennas are directional, the impact of TVI is related to the location and orientation of the antenna relative to the transmission line. If the antenna were pointed away from the line, then TVI from the line would affect reception much less than if the antenna were pointed towards the line. Since the level of TVI falls off with distance, the potential for interference becomes minimal at distances greater than several hundred feet from the centerline. Where the proposed line parallels the existing 500-kV line with higher TVI levels, interference issues may have already been addressed and the potential for impacts would be less than where a new line with no parallel lines is built.

Other forms of TVI from transmission lines are signal reflection (ghosting) and signal blocking caused by the relative locations of the transmission structure and the receiving antenna with respect to the incoming television signal. Television systems that operate at higher frequencies, such as satellite receivers, are not affected by corona-generated TVI. Cable television systems are similarly unaffected.

Interference with television reception can be corrected by any of several approaches: improving the receiving antenna system; installing a remote antenna; installing an antenna for TV stations less vulnerable to interference; connecting to an existing cable system; or installing a translator (cf. USDOE, 1977). BPA has an active program to identify, investigate, and mitigate legitimate RI and TVI complaints. It is anticipated that any instances of TVI caused by the proposed line could be effectively mitigated.

8.6 Interference with Other Devices

Corona-generated interference can conceivably cause disruption on other communications bands such as the citizen's (CB) and mobile bands. However, mobile-radio communications are not susceptible to transmission-line interference because they are generally frequency modulated (FM). Similarly, cellular telephones operate at a frequency of about 900 MHz, which is above the frequency where corona-generated interference is prevalent. In the unlikely event that interference occurs with these or other communications, mitigation can be achieved with the same techniques used for television and AM radio interference.

8.7 Conclusion

Predicted EMI levels for the proposed 500-kV transmission line are comparable to, or lower, than those that already exist near 500-kV lines; no impacts of corona-generated interference on radio, television, or other reception are anticipated. Furthermore, if interference should occur, there are various methods for correcting it: BPA has a program to respond to legitimate complaints.

9.0 Other Corona Effects

Corona is visible as a bluish glow or as bluish plumes. On the proposed 500-kV line, corona levels would be very low, so that corona on the conductors would be observable only under the darkest

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conditions and only with the aid of binoculars, if at all. Without a period of adaptation for the eyes and without intentional looking for the corona, it would probably not be noticeable.

When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of ozone and other oxidants. Ozone is approximately 90% of the oxidants, while the remaining 10% is composed principally of nitrogen oxides. The national primary ambient air quality standard for photochemical oxidants, of which ozone is the principal component, is a one-hour average not to exceed 235 micrograms/cubic meter) or 120 parts per billion. The maximum incremental ozone levels at ground level produced by corona activity on the proposed transmission line during foul weather would be much less than 1 part per billion. This level is insignificant when compared with natural levels and fluctuations in natural levels.

10.0 Summary

Electric and magnetic fields from the proposed transmission line have been characterized using well-known techniques accepted within the scientific and engineering community. The expected electric-field levels from the proposed line at minimum design clearance would be comparable to those from existing 500-kV lines in Oregon, Washington, and elsewhere. The expected magnetic-field levels from the proposed line would be comparable to, or less than, those from other 500-kV lines in Oregon, Washington, and elsewhere.

The peak electric field expected under the proposed line would be less than 9.0 kV/m; the maximum value at the edge of the right-of-way would be about 2.8 kV/m. Clearances at road crossings would be increased to reduce the peak electric-field value to 4.4 kV/m.

Under maximum current conditions, the maximum magnetic fields under the proposed line would be 311 mG; at the edge of the right-of-way of the proposed line the maximum magnetic field would be 89 mG.

The electric fields from the proposed line would meet regulatory limits for public exposure in Oregon, but could exceed the regulatory limits or guidelines for peak fields established in some other states and by ICNIRP. Washington does not have a limit for electric fields from transmission lines. The magnetic fields from the proposed line would be within the regulatory limits of the two states that have established them and within guidelines for public exposure established by ICNIRP. Oregon and Washington do not have any magnetic-field regulatory limits or guidelines.

Short-term effects from transmission-line fields are well understood and can be mitigated. Nuisance shocks arising from electric-field induced currents and voltages could be perceivable on the right-of-way of the proposed line. It is common practice to ground permanent conducting objects during and after construction to mitigate against such occurrences.

Corona-generated audible noise from the line would be perceivable during foul weather in areas where there are no immediately adjacent parallel lines. In sections with parallel lines the increase in audible noise during foul weather caused by the proposed line would be barely perceptible. The levels would be comparable to those near existing 500-kV transmission lines in Oregon and Washington, would be in compliance with noise regulations in Oregon and Washington, and would be below levels specified in EPA guidelines.

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Corona-generated electromagnetic interference from the proposed line would be comparable to or less than that from existing 500-kV lines in Washington and Oregon. Radio interference levels would be below limits identified as acceptable. Television interference, a foul-weather phenomenon, is anticipated to be comparable to or less than that from existing 500-kV lines in Oregon and Washington; if legitimate complaints arise, BPA has a mitigation program.

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 Tables: Electrical Effects*

Table 1: Possible configurations for McNary – John Day 500-kV corridor.

Configuration	Description of other lines in corridor with McNary – John Day 500-kV line	Miles
1	McNary – Horse Heaven – Harvalum 230-kV and McNary – Ross 345-kV lines ¹	73.0
2	Horse Heaven – Harvalum 230-kV, McNary – Ross 345-kV, and Ashe – Marion No. 1/ Ashe – Slat No. 1 double-circuit 500-kV	4.1
3	Proposed McNary – John Day 500-kV line only	3.0
4	Horse Heaven – Harvalum 230-kV, McNary – Ross 345-kV, and Hanford – John Day 500-kV lines (125-ft. spacing)	— ²
4A	Horse Heaven – Harvalum 230-kV, McNary – Ross 345-kV, and re-located Hanford – John Day 500-kV lines (proposed line located on existing Hanford – John Day towers)	— ²
4B	Horse Heaven – Harvalum 230-kV, McNary – Ross 345-kV, and Hanford – John Day 500-kV lines (275-ft. spacing)	— ²

¹ Four different electrical phasing options are present. Only maximum field results are presented.
² Length of individual configurations depends on engineering design. Total length of section parallel to Hanford – John Day 500-kV line is 6.7 miles.

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Table 2: Physical and electrical characteristics of configurations in the McNary – John Day 500-kV transmission-line corridor. (4 pages)

	Proposed	Existing Lines in Corridor	
Configuration	3	1	
Line Description	McNary – John Day 500-kV Only	McNary – Horse Heaven – Harvalum 230-kV	McNary – Ross 345-kV
Voltage, kV Maximum/Average¹	550/540	242/237	362/355
Peak current, A Existing/Proposed	1758	1107/985	516/604
Electric phasing (south-north)	CBA	CBA ²	ACB ²
Clearance, ft. Minimum/Average¹	35/45	26.5/36.5	34/44
Centerline distance-direction from McNary – John Day 500-kV Line, ft.	— ³	250 South	125 South
Centerline distance to edge of ROW, ft.	72.5 – 187.5	62.5	62.5
Tower configuration	Delta	Flat	Flat
Phase spacing, ft.	48H, 34.5V	26.3H	32H
Conductor: #/diameter, in.; spacing, in.	3/1.300; 17.04	1/1.382	1/1.602

¹ Average voltage and average clearance used for corona calculations.

² Most prevalent phasing scheme; three other phasing schemes also present in corridor.

³ Existing lines are 625 feet south of proposed line and affect audible noise but not electric or magnetic fields near proposed line.

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Table 2, continued

	Existing Lines in Corridor		
Configuration	2		
Line Description	Horse Heaven – Harvalum 230-kV	McNary – Ross 345-kV	Ashe – Marion No. 1/ Ashe – Slatt No. 1 500-kV Double Circuit
Voltage, kV Maximum/Average¹	242/237	362/355	550/540
Peak current, A Existing/Proposed	817/805	516/604	1239/1332 1760/1802
Electric phasing (south-north)	CBA	ACB	A A B C C B
Clearance, ft. Minimum/Average¹	26.5/36.5	34/44	35/45
Centerline distance-direction from McNary – John Day 500-kV Line, ft.	435 South	310 South	200 South
Centerline distance to edge of ROW, ft.	62.5	—	100
Tower configuration	Flat	Flat	Vertical, Double-circuit
Phase spacing, ft.	26.3H	32H	30H, 50H, 30H, 31V
Conductor: #/diameter, in.; spacing, in.	1/1.382	1/1.602	3/1.602; 17.04

¹ Average voltage and average clearance used for corona calculations.

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Table 2, continued

	Existing Lines in Corridor		
Configuration	4, 4B		
Line Description	Horse Heaven – Harvalum 230-kV	McNary – Ross 345-kV	Hanford – John Day 500-kV
Voltage, kV Maximum/Average¹	242/237	362/355	550/540
Peak current, A Existing/Proposed	817/805	516/604	1797/1842
Electric phasing (south-north)	BAC	BAC	CBA
Clearance, ft. Minimum/Average¹	26.5/36.5	34/44	33/43
Centerline distance-direction from McNary – John Day 500-kV Line, ft.	125 North (4) 275 North (4B)	250 North (4) 400 North (4B)	375 North (4) 525 North (4B)
Centerline distance to edge of ROW, ft.	62.5	—	220
Tower configuration	Flat	Flat	Delta
Phase spacing, ft.	26.3H	32H	40H, 27.5V
Conductor: #/diameter, in.; spacing, in.	1/1.382	1/1.602	2/1.602; 18.0

¹ Average voltage and average clearance used for corona calculations.

*Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects*

Table 2, continued

	Existing Lines in Corridor		
Configuration	4A		
Line Description	Horse Heaven – Harvalum 230-kV	McNary – Ross 345-kV	Hanford – John Day 500-kV⁴
Voltage, kV Maximum/Average¹	242/237	362/355	550/540
Peak current, A Existing/Proposed	817/805	516/604	1797/1842
Electric phasing (south-north)	BAC	BAC	CBA
Clearance, ft. Minimum/Average¹	26.5/36.5	34/44	33/43
Centerline distance-direction from McNary – John Day 500-kV Line, ft.	250 South	125 South	0 North ⁴
Centerline distance to edge of ROW, ft.	62.5	—	220 (existing) 75 (proposed)
Tower configuration	Flat	Flat	Delta
Phase spacing, ft.	26.3H	32H	40H, 27.5V
Conductor: #/diameter, in.; spacing, in.	1/1.382	1/1.602	2/1.602; 18.0

¹ Average voltage and average clearance used for corona calculations.

⁴ Data is for existing configuration. Proposed line would be located on the existing towers and the Hanford – John Day 500-kV line would be re-located 200 feet north of its existing location on new towers with 3/1.300-in. conductors (Figure 1e).

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Table 3: Calculated peak and edge-of-right-of-way electric fields for the proposed McNary – John Day 500-kV line operated at maximum voltage by configuration. Configurations are described in Tables 1 and 2 and shown in Figure 1.

a) Peak electric field on right-of-way, kV/m

Location	Under Proposed Line		In Remainder of Proposed Corridor		In Existing Corridor	
	Line Clearance	Minimum	Average	Minimum	Average	Minimum
Configuration 1	8.9	6.0	4.8	3.4	4.7	3.3
Configuration 2	8.9	6.0	8.8	6.4	8.8	6.3
Configuration 3	9.0	6.0	—	—	—	—
Configuration 4	8.8	5.9	8.9	6.0	8.9	6.0
Configuration 4A	8.9	6.0	8.8	5.9	8.9	6.0
Configuration 4B	8.8	5.9	8.9	6.0	8.9	6.0

b) Electric field at edge of proposed right-of-way, kV/m

Location	Adjacent to Proposed Line ¹		Adjacent to Existing Line in Proposed Corridor		In Existing Corridor ¹	
	Line Clearance	Minimum	Average	Minimum	Average	Minimum
Configuration 1	0.3	0.3	1.4	1.3	0.03, 1.4	0.04, 1.3
Configuration 2	2.8	2.8	1.2	1.1	0.3, 1.2	0.3, 1.1
Configuration 3	2.5, 0.4	2.4, 0.4	—	—	—	—
Configuration 4	2.5	2.5	0.2	0.2	0.1, 0.2	0.1, 0.2
Configuration 4A	2.5	2.5	1.5	1.4	0.1, 1.5	0.1, 1.4
Configuration 4B	2.5	2.5	0.2	0.2	0.1, 0.2	0.1, 0.2

¹ Electric field at edge of right-of-way adjacent to proposed line is given first, except for Configuration 3, where levels at 75 and 175 ft. from centerline are given.

*Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects*

Table 4: Calculated peak and edge-of-right-of-way magnetic fields for the proposed McNary – John Day 500-kV line operated at maximum current by configuration. Configurations are described in Tables 1 and 2 and shown in Figure 1.

a) Peak magnetic field on right-of-way, mG

Location	Under Proposed Line		In Remainder of Proposed Corridor		In Existing Corridor		
	Line Clearance	Minimum	Average	Minimum	Average	Minimum	Average
Configuration 1		296	203	261	166	298	192
Configuration 2		309	216	241	178	225	162
Configuration 3		303	207	—	—	—	—
Configuration 4		301	207	333	218	327	215
Configuration 4A		311	202	302	205	327	215
Configuration 4B		296	203	335	219	327	215

b) Magnetic field at edge of proposed right-of-way, mG

Location	Adjacent to Proposed Line ¹		Adjacent to Existing Line in Proposed Corridor		In Existing Corridor ¹		
	Line Clearance	Minimum	Average	Minimum	Average	Minimum	Average
Configuration 1		17	17	78	65	3, 84	3, 71
Configuration 2		89	79	58	47	12, 58	12, 48
Configuration 3		82, 16	71, 16	—	—	—	—
Configuration 4		77	67	10	10	8, 9	7, 9
Configuration 4A		89	77	69	60	69, 6	59, 6
Configuration 4B		80	70	10	10	3, 9	3, 9

¹ Magnetic field at edge of right-of-way adjacent to proposed line is given first, except for Configuration 3, where levels at 75 and 175 ft. from centerline are given.

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Table 5: States with transmission-line field limits.

STATE AGENCY	WITHIN RIGHT-OF- WAY	AT EDGE OF RIGHT-OF- WAY	COMMENTS
a. 60-Hz ELECTRIC-FIELD LIMIT, kV/m			
Florida Department of Environmental Regulation	8 (230 kV) 10 (500 kV)	2	Codified regulation, adopted after a public rulemaking hearing in 1989.
Minnesota Environmental Quality Board	8	—	12-kV/m limit on the high-voltage direct-current (HVDC) nominal electric field.
Montana Board of Natural Resources and Conservation	7 ¹	1 ²	Codified regulation, adopted after a public rulemaking hearing in 1984.
New Jersey Department of Environmental Protection	—	3	Used only as a guideline for evaluating complaints.
New York State Public Service Commission	11.8 (7,11) ¹	1.6	Explicitly implemented in terms of a specified right-of-way width.
Oregon Facility Siting Council	9	—	Codified regulation, adopted after a public rulemaking hearing in 1980.
b. 60-Hz MAGNETIC-FIELD LIMIT, mG			
Florida Department of Environmental Regulation	—	150 (230 kV) 200 (500 kV)	Codified regulations, adopted after a public rulemaking hearing in 1989.
New York State Public Service Commission	—	200	Adopted August 29, 1990.

¹ At road crossings

² Landowner may waive limit

Sources: TDHS Report, 1989; TDHS Report, 1990

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Table 6: Common noise levels.

Sound Level, dBA	Noise Source or Effect
128	Threshold of pain
108	Rock-and-roll band
80	Truck at 50 ft.
70	Gas lawnmower at 100 ft.
60	Normal conversation indoors
50	Moderate rainfall on foliage
47	Edge of proposed 500-kV right-of-way during rain
40	Refrigerator
25	Bedroom at night
0	Hearing threshold

Adapted from: USDOE, 1996.

Table 7: Typical sound attenuation (in decibels) provided by buildings.

	Windows opened	Windows closed
Warm climate	12	24
Cold climate	17	24

Source: EPA, 1978.

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Table 8: Predicted foul-weather audible noise (AN) levels at edge of proposed right-of-way (ROW) for the McNary – John Day 500-kV line by configuration. AN levels expressed in decibels on the A-weighted scale (dBA). L₅₀ and L₅ denote the levels exceeded 50 and 5 percent of the time, respectively. Configurations are described in Tables 1 and 2 and shown in Figure 1.

Configuration ¹	Foul-weather AN			
	Proposed Corridor ¹		Existing Corridor ¹	
	L ₅₀ , dBA	L ₅ , dBA	L ₅₀ , dBA	L ₅ , dBA
1	49, 50	52, 54	46, 49	50, 53
2	51, 50	54, 54	47, 50	51, 53
3	49, 46	52, 49	43, 41	46, 45
4	53, 54	56, 57	51, 54	55, 57
4A	54, 53	57, 57	53,53	56, 57
4B	52, 54	55, 57	50, 54	53, 57

¹ AN level at edge of right-of-way adjacent to proposed line is given first, except for Configuration 3, where levels at 75 and 175 ft. from centerline are given.

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Table 9: Predicted fair-weather radio interference (RI) levels at 100 feet (30.5 m) from the outside conductor of the proposed McNary – John Day 500-kV line by configuration. RI levels given in decibels above 1 microvolt/meter (dB μ V/m) at 1.0 MHz. L₅₀ denotes level exceeded 50 percent of the time. Configurations are described in Tables 1 and 2 and shown in Figure 1.

Configuration	Fair-weather RI	
	Proposed Corridor ¹	Existing Corridor ¹
	L ₅₀ , dB μ V/m	L ₅₀ , dB μ V/m
1	38, 31	39, 30
2	38, 31	38, 31
3	37	—
4	37, 45	33, 45
4A	37, 33	45, 33
4B	37, 45	33, 45

¹ RI level at 100 ft. from outside conductor of proposed line given first.

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: *Electrical Effects*

Table 10: Predicted maximum foul-weather television interference (TVI) levels at 100 feet (30.5 m) from the outside conductor of the proposed McNary – John Day 500-kV line by configuration. TVI levels given in decibels above 1 microvolt/meter (dBμV/m) at 75 MHz. Configurations are described in detail in Tables 1 and 2 and shown in Figure 1.

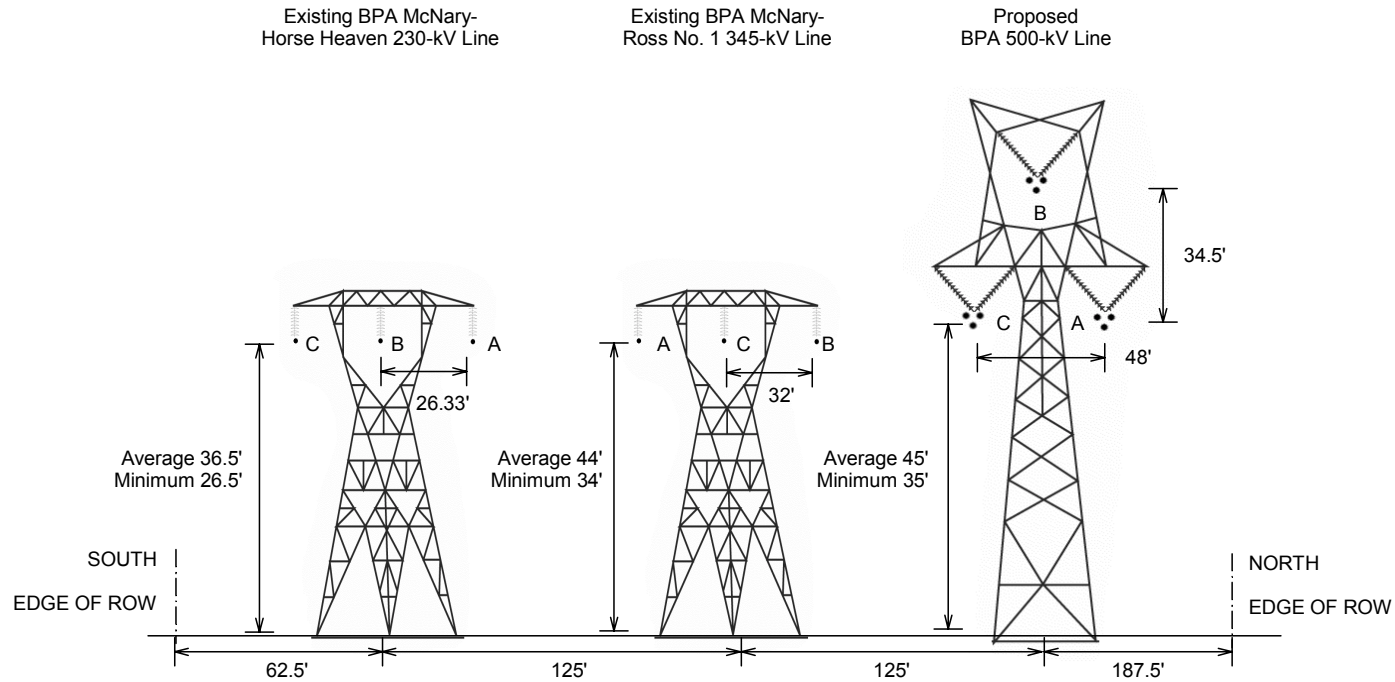
Configuration	Foul-weather TVI	
	Proposed Corridor ¹	Existing Corridor ¹
	Maximum (foul), dBμV/m	Maximum (foul), dBμV/m
1	23, 14	26, 14
2	23, 14	21, 14
3	23	—
4	23, 33	14, 33
4A	23, 14	33, 14
4B	23, 33	14, 33

¹ TVI level at 100 ft. from outside conductor of proposed line is given first.

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 1: Configurations for the proposed McNary – John Day 500-kV line: a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1); b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2); c) Proposed line with no parallel lines (Configuration 3); d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4 and 4B); and e) Proposed line on existing Hanford – John Day 500-kV line towers with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4A). (5 pages)

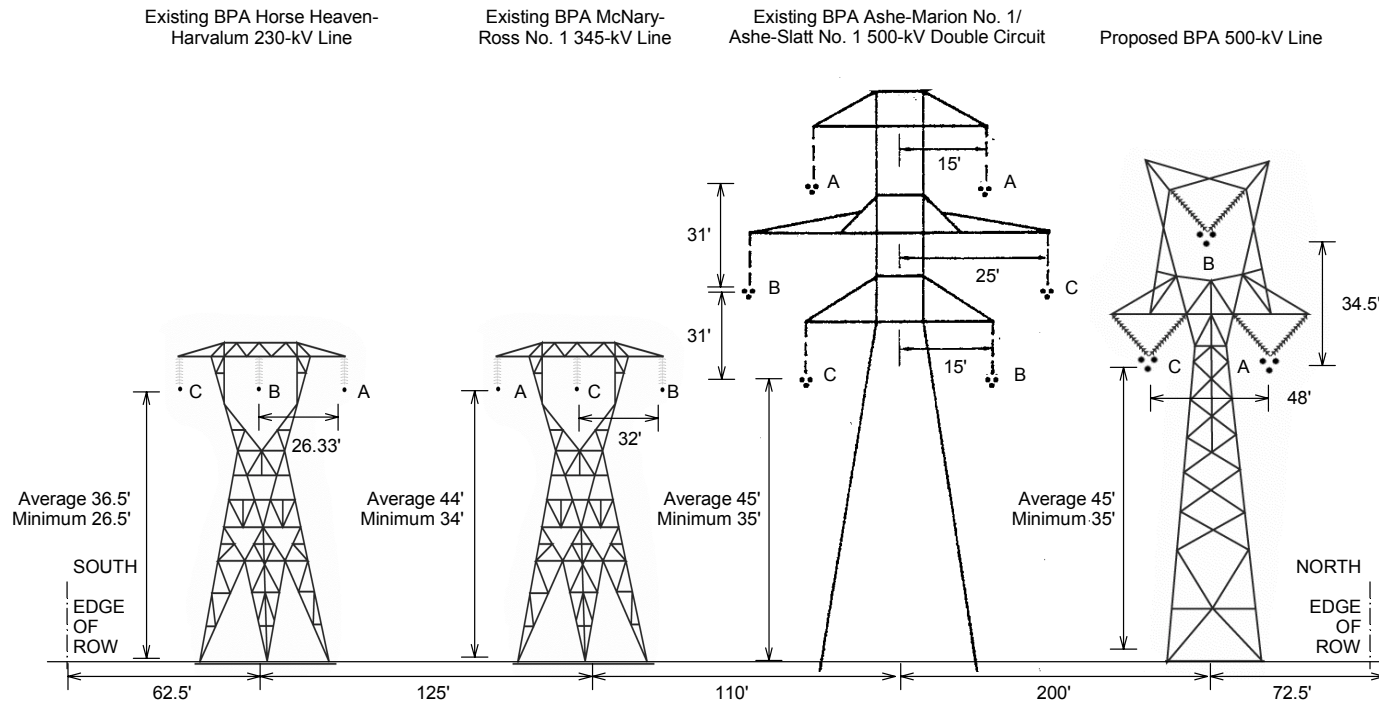
a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1) (not to scale)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Figure 1, continued

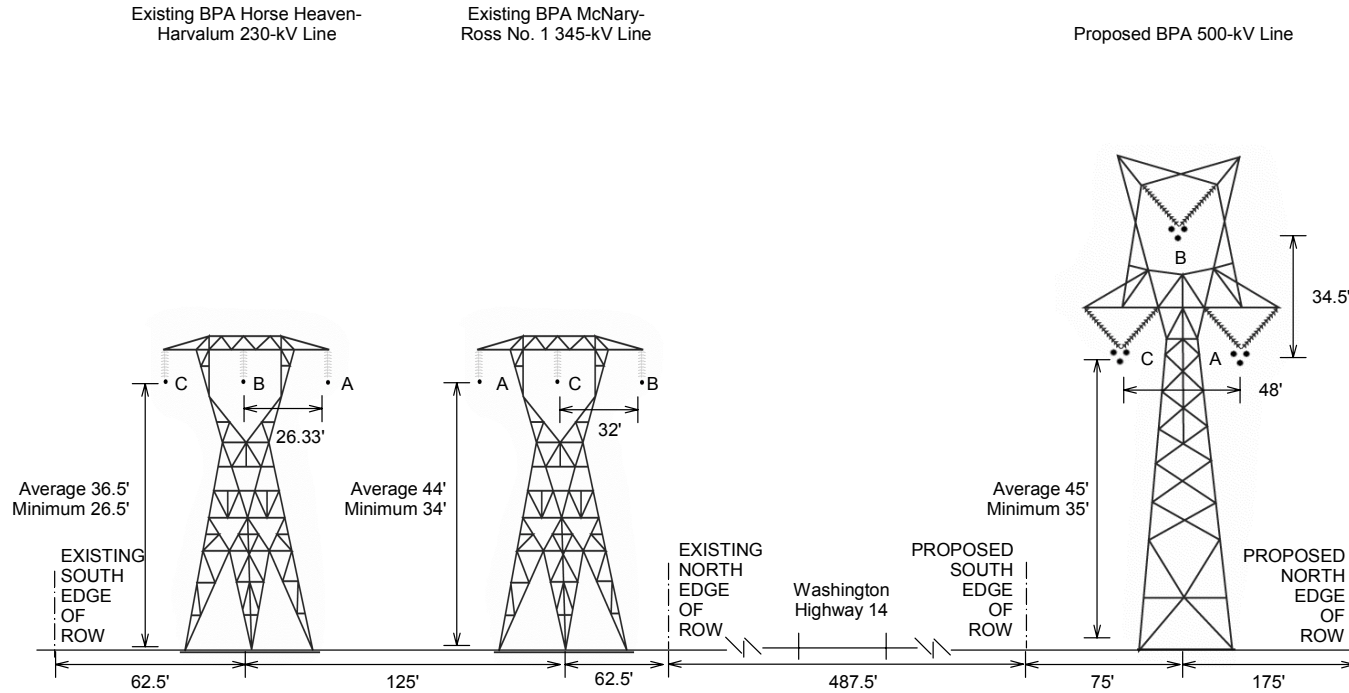
b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2) (not to scale)



*Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects*

Figure 1, continued

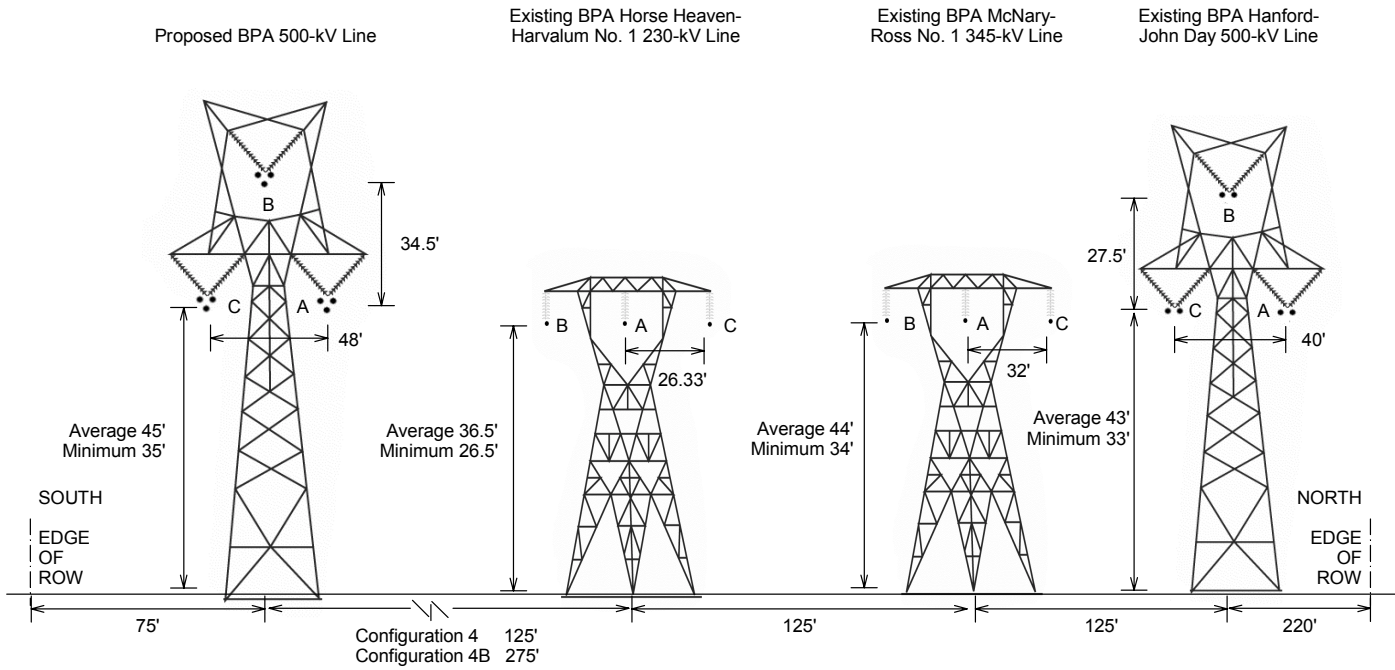
c) Proposed line with no parallel lines within 600 feet (Configuration 3) (not to scale)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 1, continued

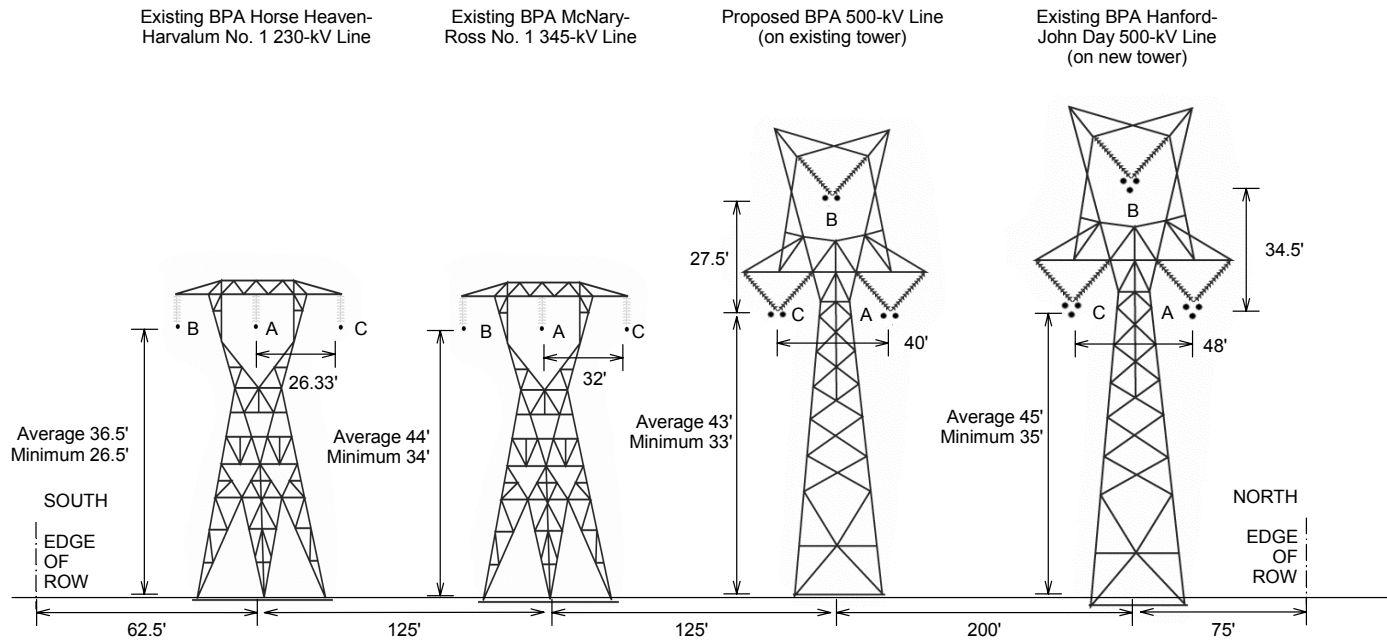
d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4 and 4B) (not to scale)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 1, continued

- e) Proposed line on existing Hanford – John Day 500-kV towers with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4A)
 (not to scale)

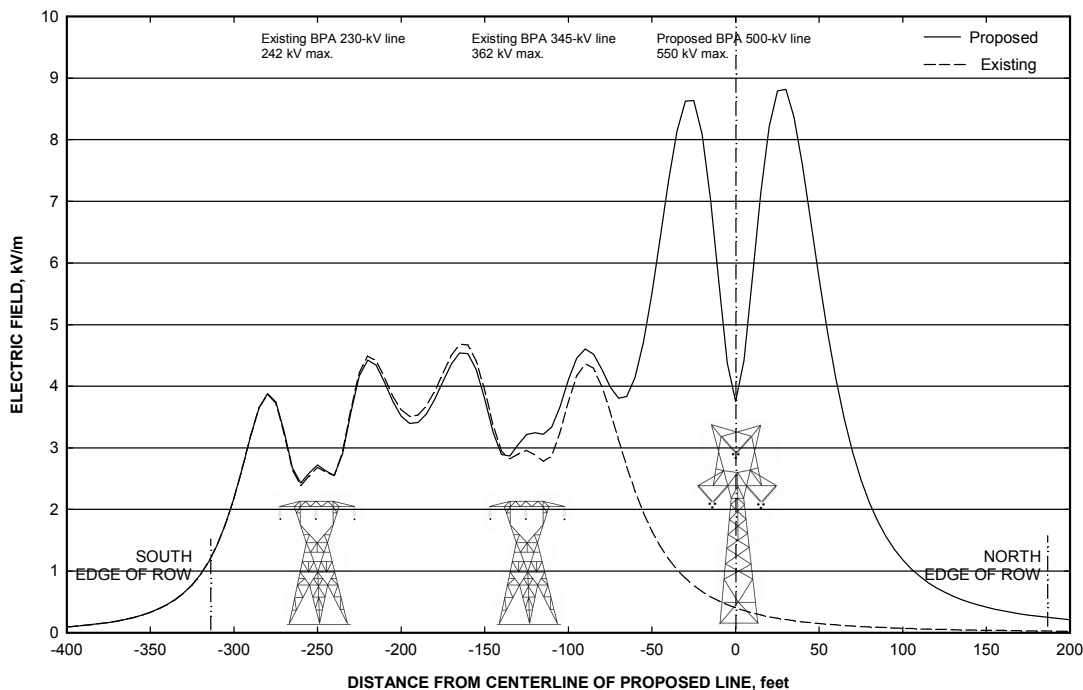


Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Figure 2: Electric-field profiles for configurations of the proposed McNary – John Day 500-kV line under maximum voltage conditions: a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1); b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2); c) Proposed line with no parallel lines within 600 feet (Configuration 3); d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4); e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4A); and f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B). (4 pages) Configurations are described in Tables 1 and 2 and shown in Figure 1.

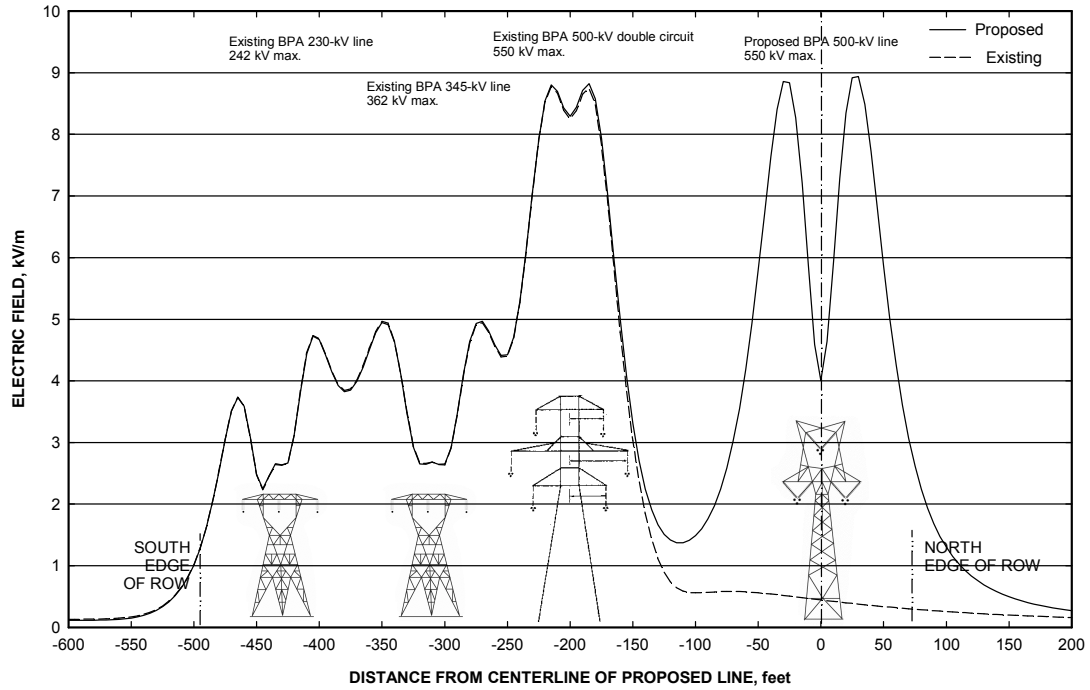
a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1)



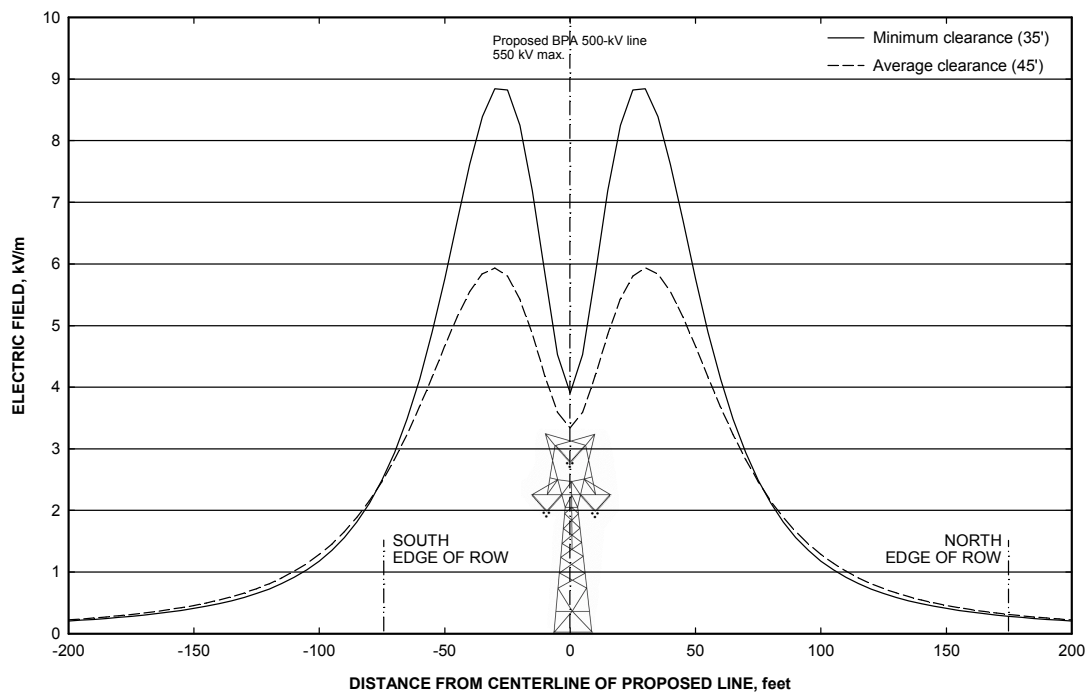
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 2, continued

- b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2)



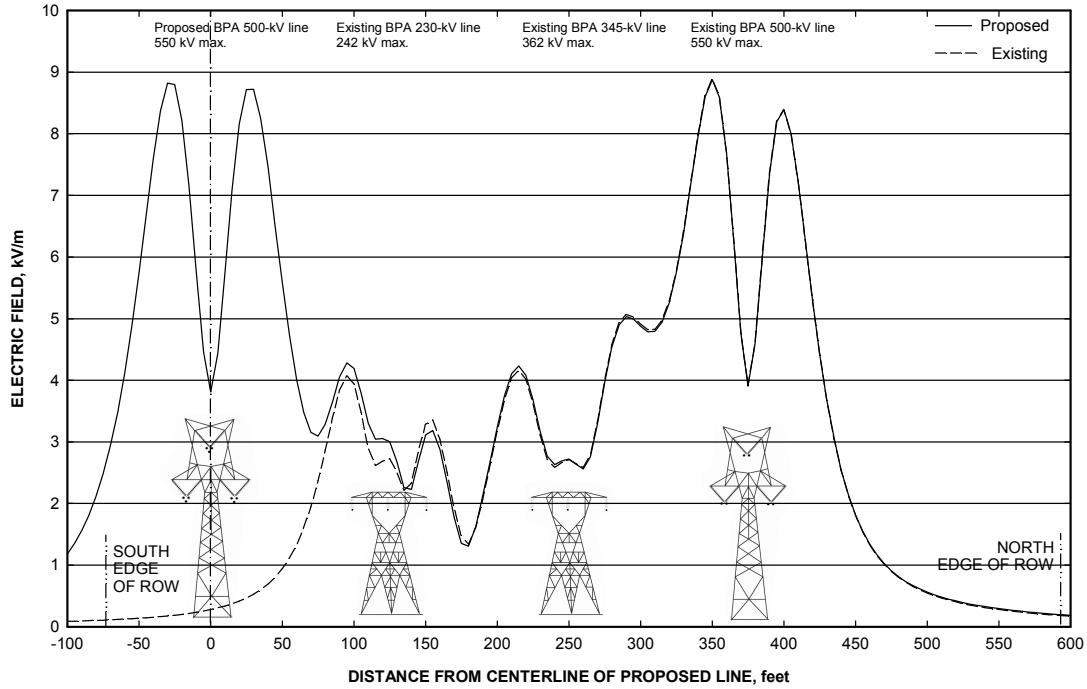
- c) Proposed line with no parallel lines within 600 feet (Configuration 3)



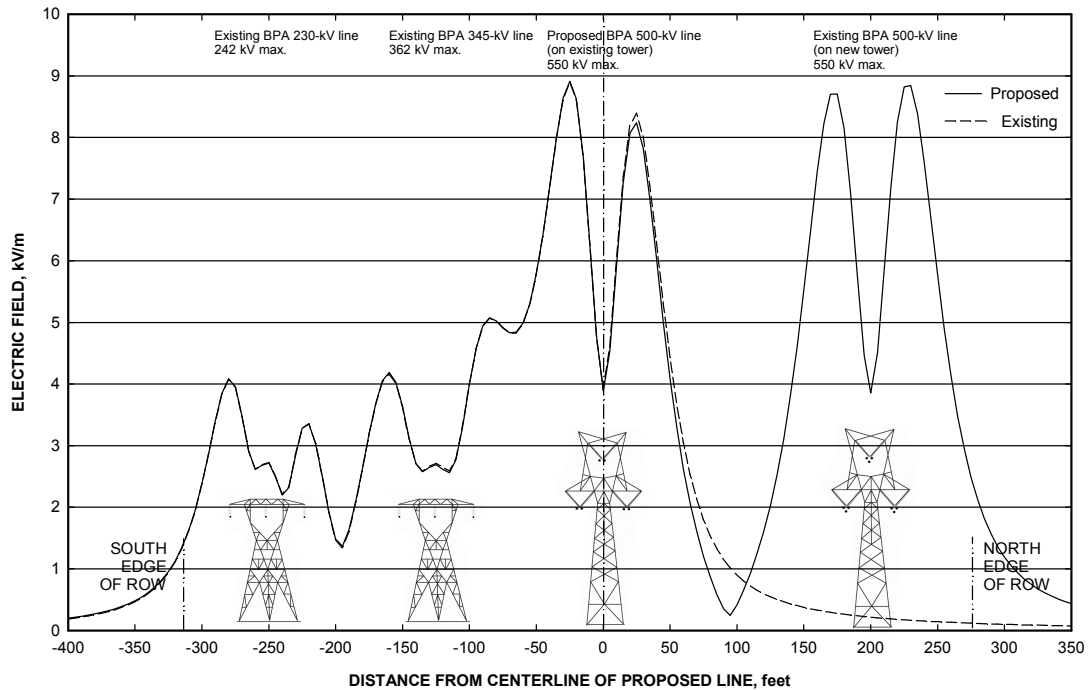
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 2, continued

- d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4, 125-ft. spacing)



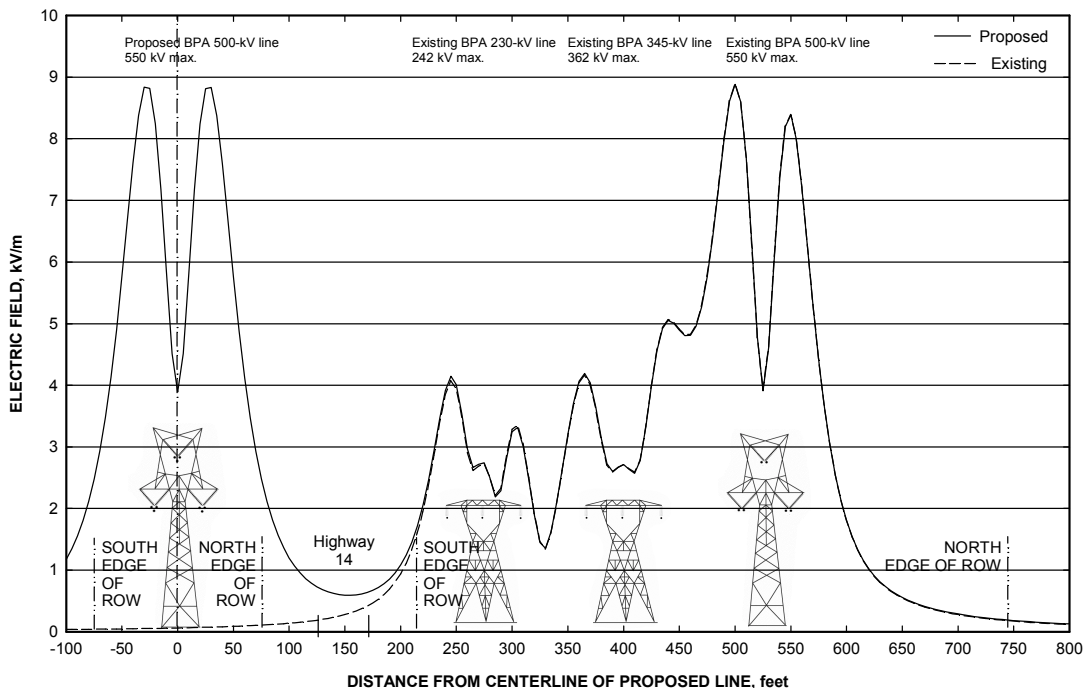
- e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4A)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 2, continued

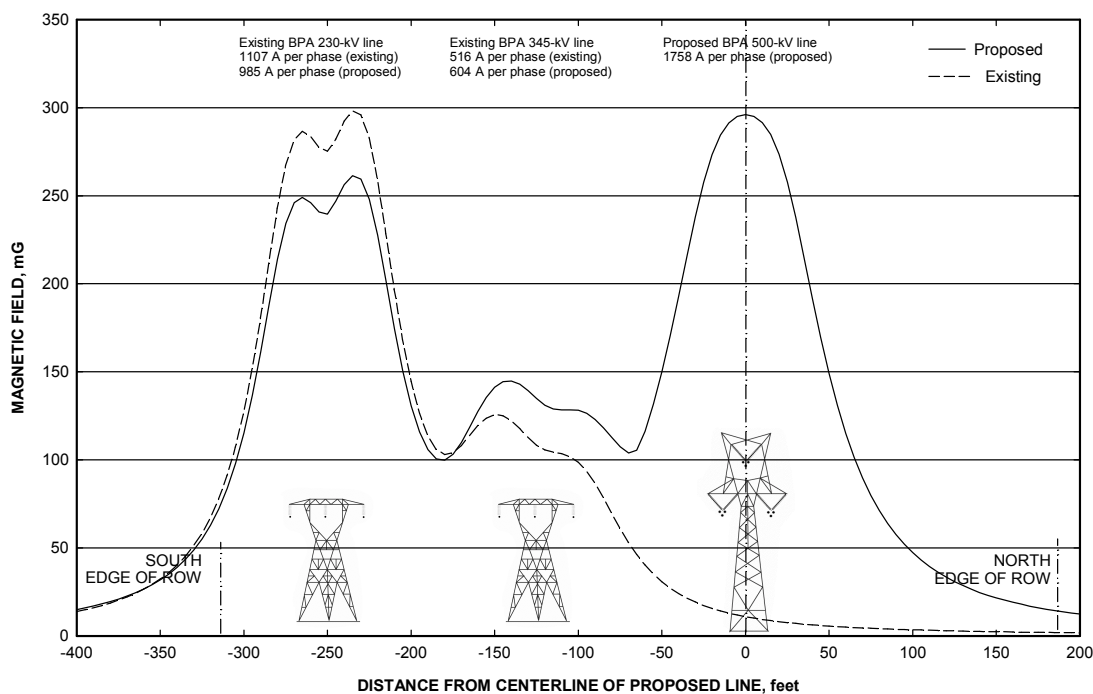
- f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B, 275-ft. spacing)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Figure 3: Magnetic-field profiles for configurations of the proposed McNary – John Day 500-kV line under maximum current conditions: a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1); b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2); c) Proposed line with no parallel lines (Configuration 3); and d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4); e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4A); and f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B). (4 pages) Configurations are described in Tables 1 and 2 and shown in Figure 1.

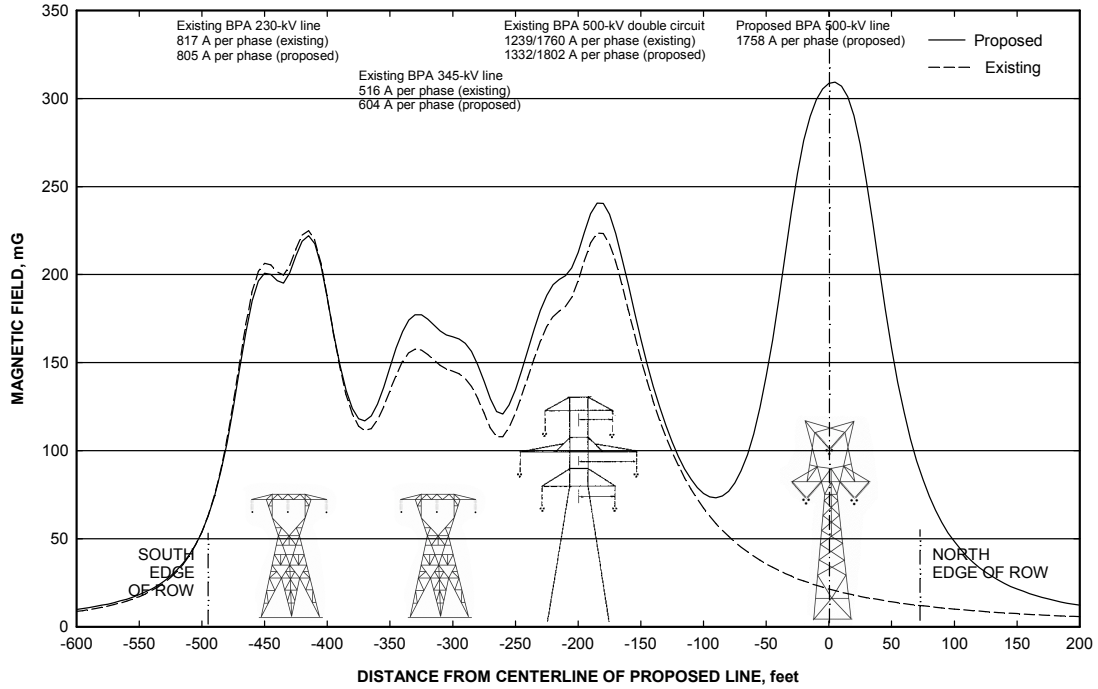
a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1)



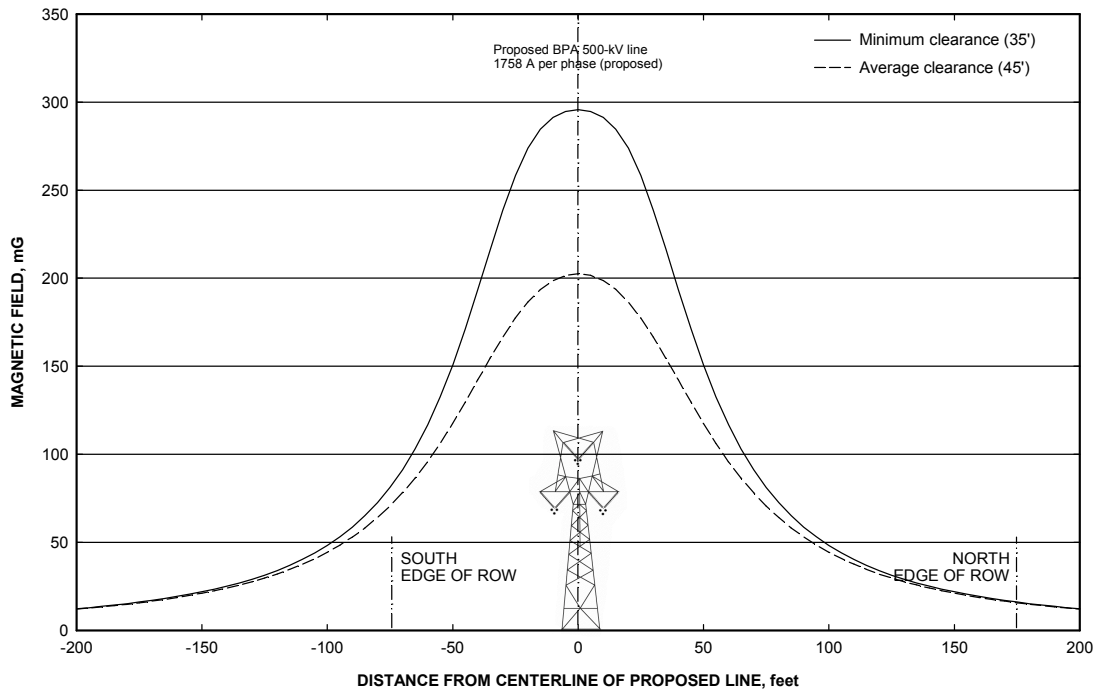
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 3, continued

b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2)



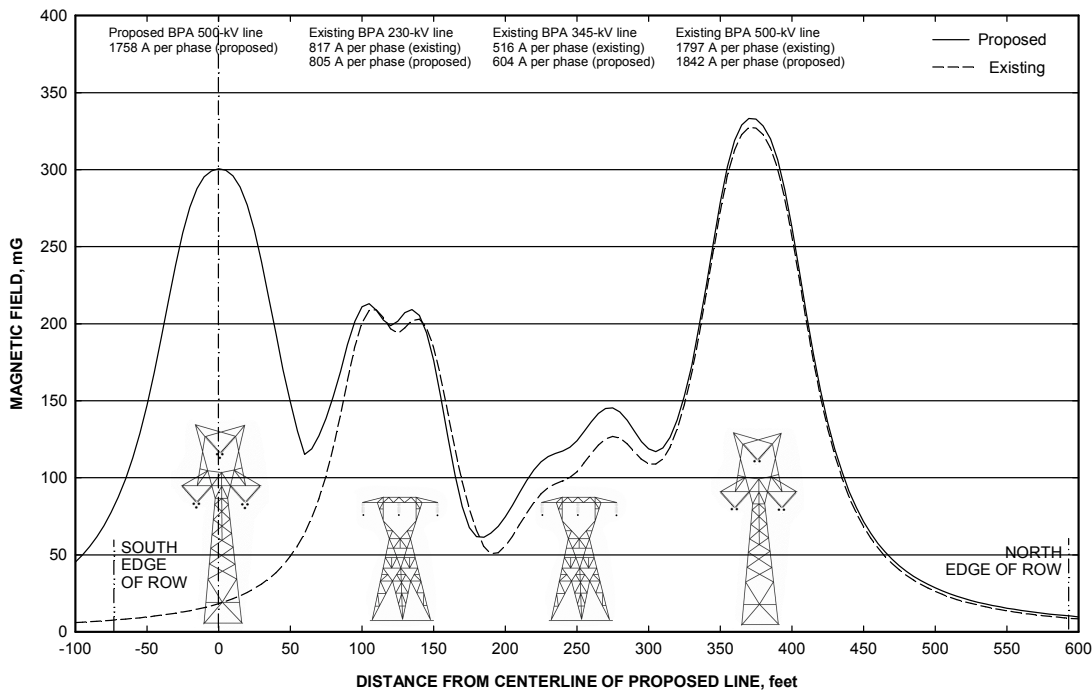
c) Proposed line with no parallel lines within 600 feet (Configuration 3)



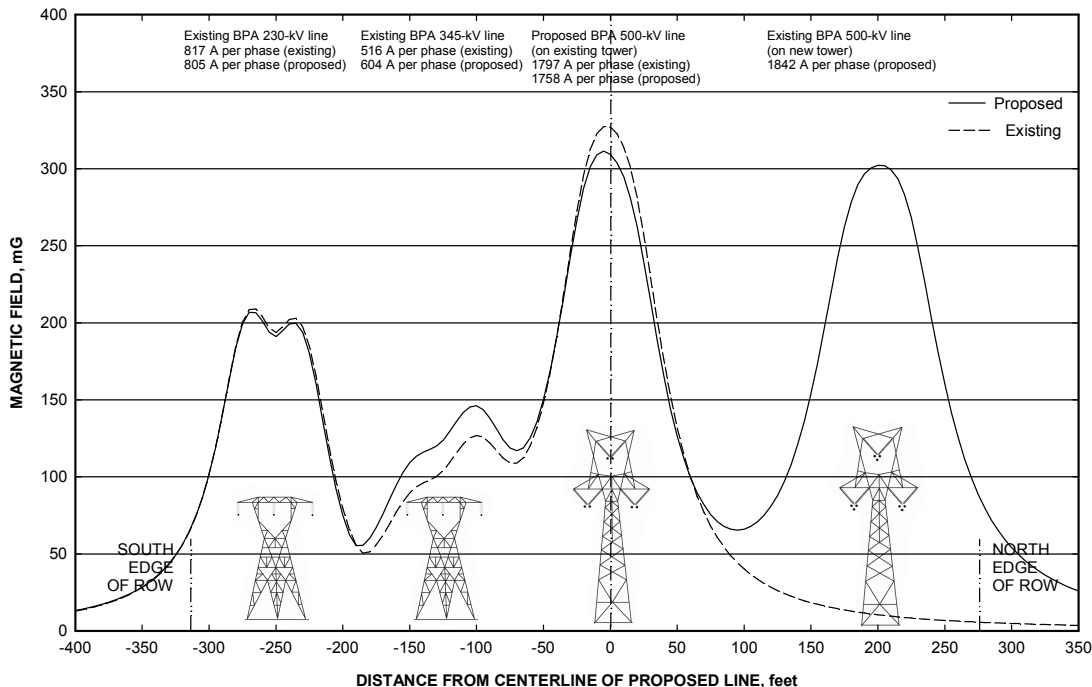
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 3, continued

d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4, 125-ft. spacing)



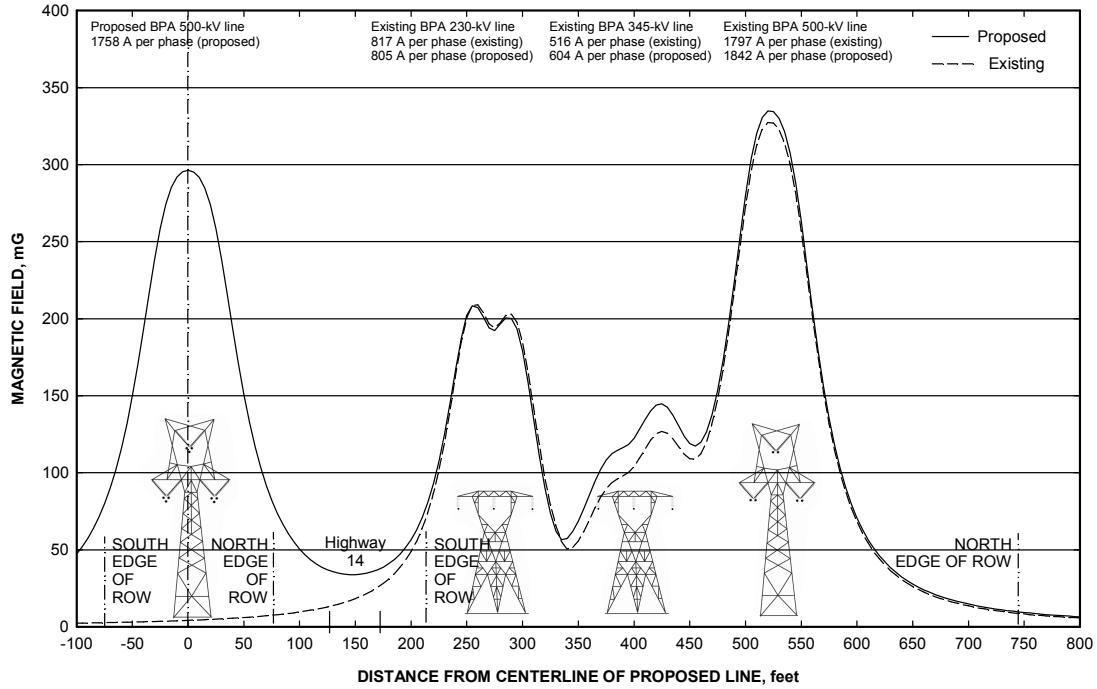
e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4A)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 3, continued

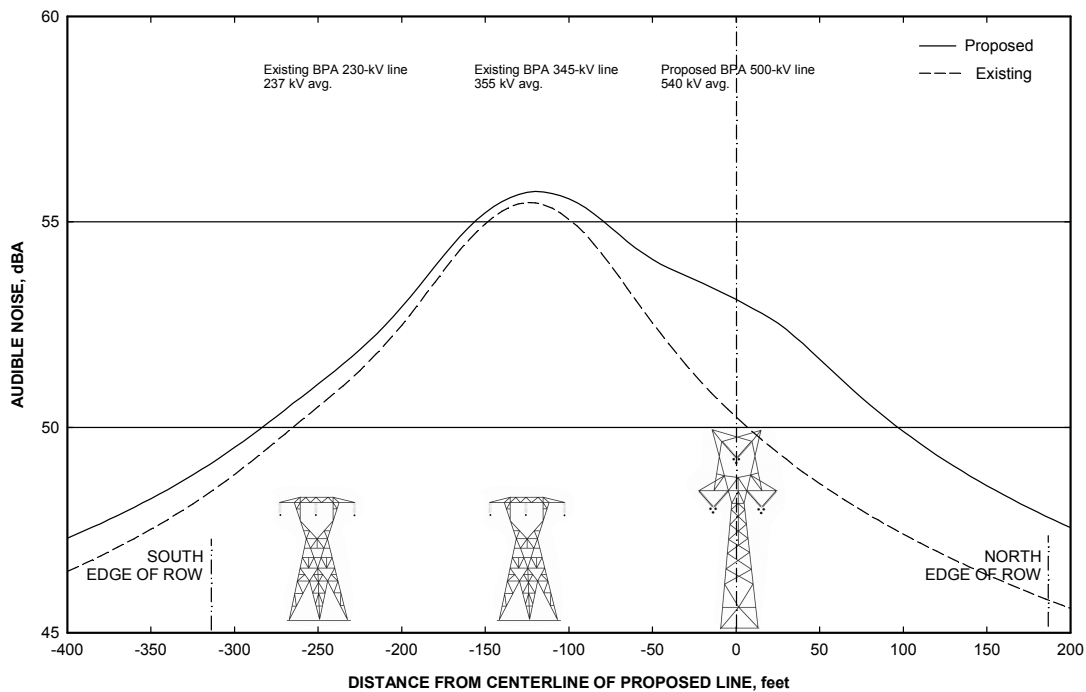
- f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B, 275-ft. spacing)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
Tables: Electrical Effects

Figure 4: Predicted foul-weather L_{50} audible noise levels from configurations of proposed McNary – John Day 500-kV line: a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1); b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2); c) Proposed line with no parallel lines (Configuration 3); and d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4); e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configurations 4A); and f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B). (4 pages) Configurations are described in Tables 1 and 2 and shown in Figure 1.

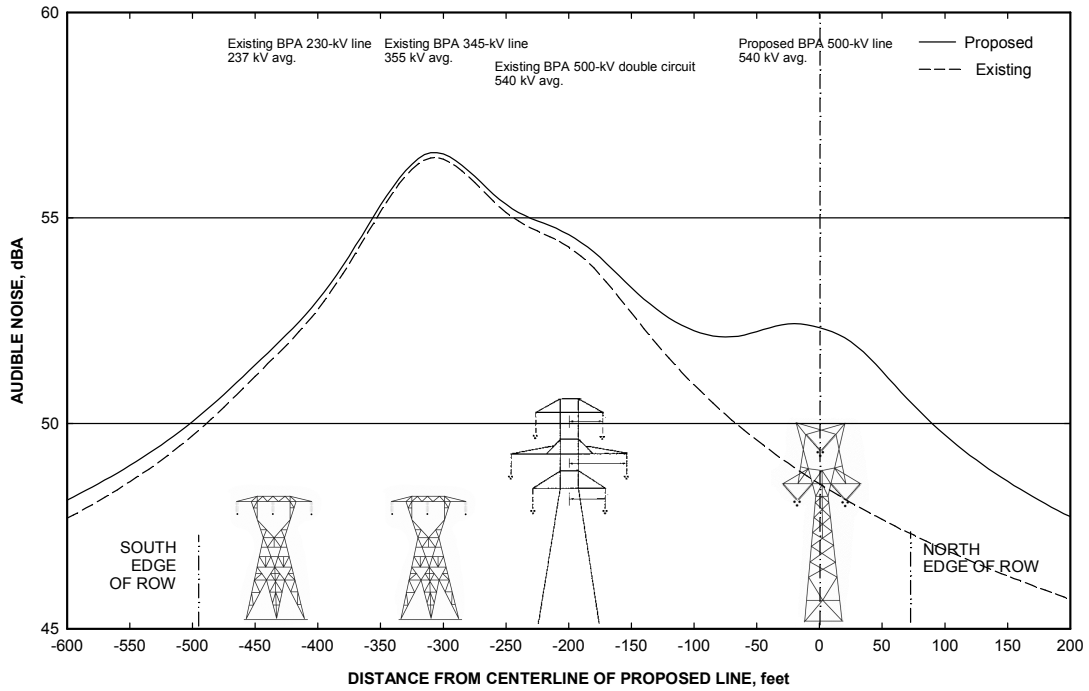
a) Proposed line with parallel 230-kV and 345-kV lines (Configuration 1)



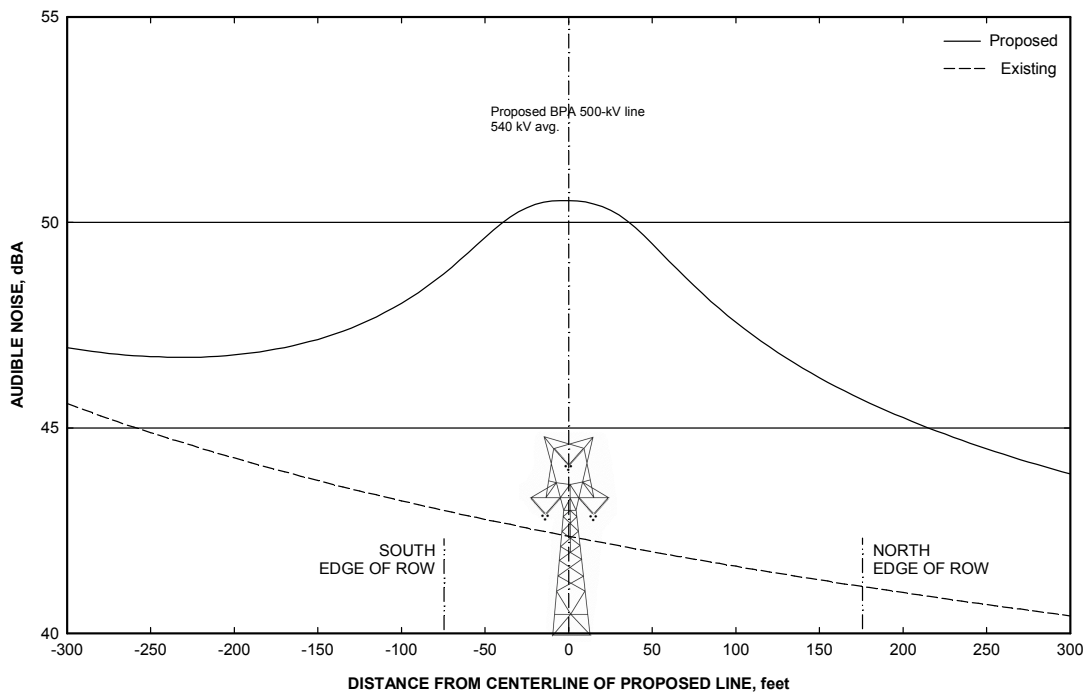
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 4, continued

- b) Proposed line with parallel 230-kV, 345-kV, and double-circuit 500-kV lines (Configuration 2)



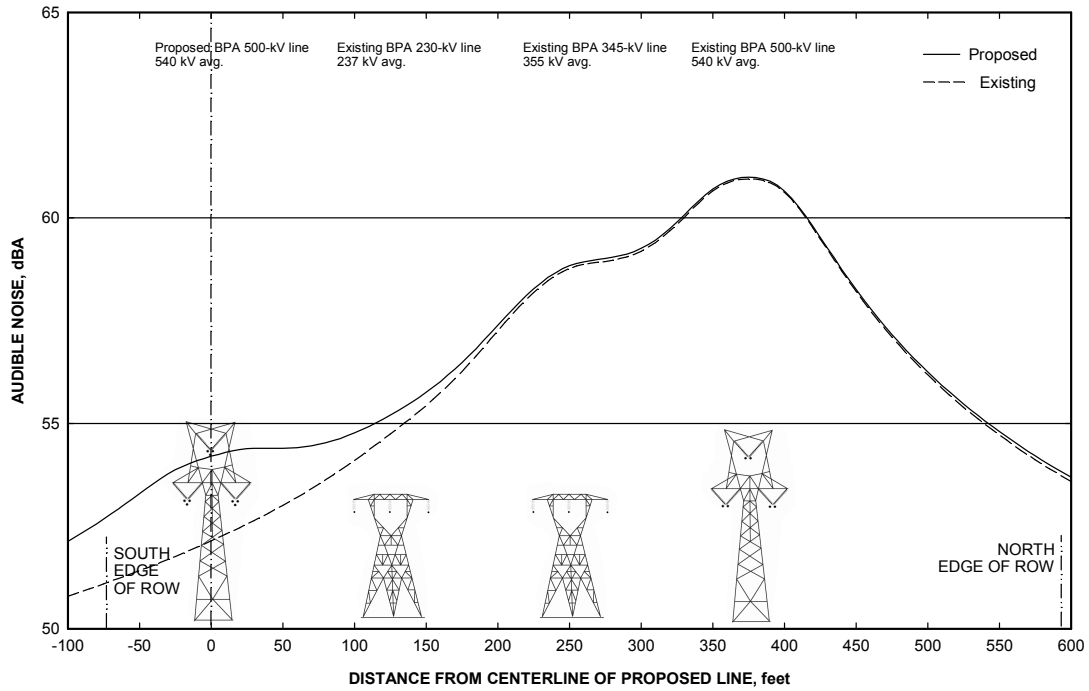
- c) Proposed line with no parallel lines within 600 feet (Configuration 3)



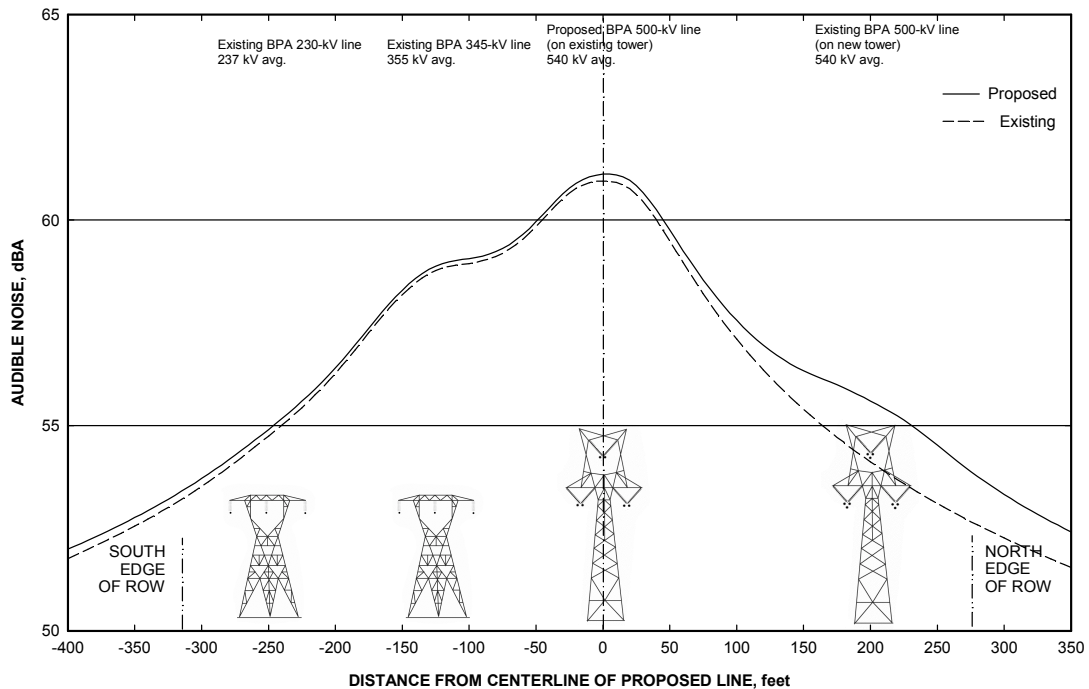
Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 4, continued

- d) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4, 125-ft. spacing)



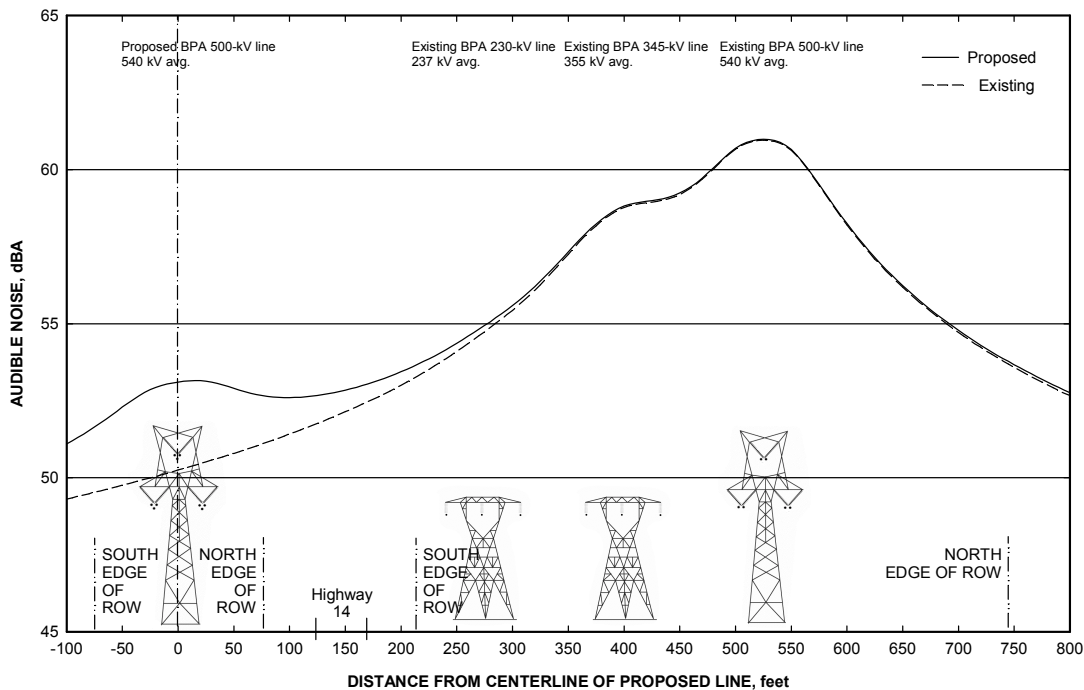
- e) Proposed line on existing towers with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4A)



Bonneville Power Administration/McNary – John Day 500-kV Transmission-line Project
 Tables: Electrical Effects

Figure 4, continued

- f) Proposed line with parallel 230-kV, 345-kV, and 500-kV lines (Configuration 4B, 275-ft. spacing)





TECHNICAL MEMORANDUM

Date: December 19, 2017 **Project No.:** 17-88390
To: Kellen Tardaewether, Senior Siting Analyst **Company:** Oregon Department of Energy
From: Gage Miller, Kara Warner, and Kennard F. Kosky, P.E. **Email:** Kellen.Tardaewether@oregon.gov
RE: REVIEW OF EXHIBIT X, NOISE FOR BOARDMAN TO HEMINGWAY TRANSMISSION LINE PROJECT

1.0 INTRODUCTION

Golder Associates Inc. (Golder) was contracted by Oregon Department of Energy (CDOE) to review Exhibit X which provides analysis of potential noise impacts from the proposed Idaho Power Boardman to Hemmingway Transmission Line (Project). Golder reviewed the Exhibit X redlined version dated December 2017 and the responses to ODOE's Request for Additional Information also dated December 2017. In general Golder found the assessment to be adequately conservative and thorough.

2.0 GOLDER'S COMMENTS

2.1 Baseline

Golder's review of the Sound Survey Analysis and Results (Exhibit X, Section 3.4.5.2), Noise Control Regulation OAR 340-035-0035(3) sound measurement procedures, and Attachment X-6 found the baseline noise analysis to be properly performed from a technical standpoint and the use of the "late night" noise level to be conservative in nature for use as the baseline noise level for comparison to the Ambient Antidegradation Standard [OAR 340-035-0035(1)(b)(B)(i)].

2.2 Impact Assessment

Based on comments and concerns brought up in the request for additional information, Golder focused on the operational noise impacts caused by the Corona Effect. Based on research and side by side comparison of similar impact studies Golder has performed, we found the expected audible noise levels resulting from corona during foul weather conditions of 52 dBA at the edge of the right of way and 58 dBA under the transmission line (Exhibit X, Section 3.3.2.1) to be consistent with our sources and conservative in nature.

Additionally Golder reviewed the impact assessment at the identified receptors of the foul weather corona noise conditions added to the baseline noise levels (Exhibit X, Section 3.4.5) and found them to be calculated properly and to be conservative as the calculated impacts were based only on geometric

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Kellen Tardaewether
Senior Siting Analyst

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December 19, 2017
Project No. 17-88390

spreading of noise (distance attenuation) and did not include any other attenuation factors such as ground attenuation, foliage, terrain, or other barriers that may be between the noise source and sensitive receptors.

The conclusion that the Project would comply with the maximum permissible sound levels outlined in Table 8 of regulation OAR 340-035-0035(1)(b)(B)(i), but would exceed the ambient antidegradation standard outlined in that same standard at the identified receptors seems reasonable and conservative.

2.3 Frequency of Foul Weather

The determination of frequency of foul weather (Exhibit X, pages X-22 to X-27) was reviewed by Golder's staff meteorologist and were found to be adequate. The stations chosen for analysis were also reviewed by our meteorologist and are deemed to be complete and accurate. The region is arid in nature, and the use of 0.8 to 5.0 mm/hr based on a conservative application of the Corona and Field Effects (CAFÉ) program is adequate for this study's purposes.

Historical weather data is the preferred standard to use when it comes to this type of analysis. The analysis demonstrates the "infrequent" nature of the meteorological conditions of concern (foul weather events) presented in the data from the identified weather stations and summarized in Table X-8 and Table X-9. Additionally there does appear to be some precedent, based on the footnotes (8 and 9) found and summarized on page X-27, that similar levels of precipitation in a similar area ("east of the Cascades") have been considered to be "infrequent", though Golder is not sure if exemptions were given for these projects. Using the thresholds summarized on page X-27 to determine infrequency is reasonable, but Golder considers the foul weather events to be infrequent as the Project resides in an arid climate with low levels of precipitation. This determination is based on the meteorological data alone.

2.4 Request for Exemption

Based review of the Request for Exception to Ambient Antidegradation Standard (Exhibit X, Page X-22 to X-52) and OAR 340-.35-0035(6), Golder in general found the request to be reasonable as exceedances would be infrequent based on the following reasons:

1. Baseline noise levels are conservatively estimated and are based on a late night period of time when outdoor human activities are limited. Based on the typical attenuation of open windows or doors of -10 dBA, the noise levels impacting humans indoors would be close to that of the original outdoor baseline noise levels.
2. Impact noise levels were conservatively estimated based only on distance attenuation, therefore this noise level is not expected to be consistently this elevated during every foul weather event.
3. The infrequency of foul weather events given the meteorological data provided and the arid nature of the area of the Project.

2.5 Exception Conditions

Golder reviewed the Exception Conditions sections (Exhibit X, page X-52). The requested conditions include the following language "IPC requests that authorization for exemption not be limited to a specific time of day or in any other temporal or weather-dependent manner." In section 3.3.2.1 Predicted Operational Noise Level stated that "irregularities" such as nicks and scrapes on the conductor surface, contaminants such as dust or insects, and foul weather conditions can all cause an increased corona noise level.

The condition outlined above would include an exception for all irregularities that would be difficult to identify. Some of the above irregularities, such as nicks and scrapes, could result in longer term noise impacts (not infrequent) and may be within IPC's ability to fix and control. Such irregularities would not qualify as infrequent.

Additionally when applied to the OAR 340-0035-0100 provisions for variance, this would also not qualify as being "conditions beyond the control of the persons granted such variance".

2.6 Conclusion

The applicant's Noise Exhibit X impact assessment study is reasonable, technically sound, and appropriately conservative in nature. The Project has a very low risk of having a negative impact on human health and a low risk of outdoor or indoor interference with human activities. Based on the ODEQ's Noise Control Regulations, the Project would not qualify for an exceedance/variance for non-weather related irregularities as those irregularities could be long term in nature and potentially within IPC's control. Golder recommends that ODOE confirm that the exemption would not include non-weather related irregularities that are not caused by foul weather events or a variance for irregularities that are under the operator's control.

Based on the meteorological data, foul weather events that would increase the corona noise levels to that of exceeding the Antidegradation Standard would be infrequent as a stand-alone factor, and additionally infrequent since any foul weather event would have to occur simultaneously with a low baseline noise level (typically occurring late at night). While the exhibit primarily focuses on the foul weather conditions as the only factor that it considers for determining infrequency, the exhibit does not go into much detail that foul weather conditions would also have to occur during a limited time when lower baseline noise levels are also occurring.

B2HAPPDoc ApASC Reviewing Agency Comment City of La Grande_Strope

TARDAEWETHER Kellen * ODOE

From: Robert Strope <RStrope@cityoflagrande.org>
Sent: Monday, April 30, 2018 1:21 PM
To: TARDAEWETHER Kellen * ODOE
Subject: RE: B2H ApASC Completeness Review Update and City Comments

Kellen,

I appreciate your following up on this. Have a great week.

Robert

Robert A. Strope, MPA
City Manager
City of La Grande
rstrope@cityoflagrande.org
(541) 962-1309
(541) 963-3333 fax

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From: TARDAEWETHER Kellen * ODOE [mailto:Kellen.Tardaewether@oregon.gov]
Sent: Monday, April 30, 2018 9:49 AM
To: Robert Strope <RStrope@cityoflagrande.org>
Subject: RE: B2H ApASC Completeness Review Update and City Comments

Hi Robert,

Sorry I'm just getting back to you now, I was at the Council meeting at the end of last week. I see that you included these comments in your letter and I will send them to IPC and review the letter. If, at a later date, IPC proposes to add the MUA-1 back into the proposed project, they would have to do so via an amendment and the City's applicable substantive criteria and comments would be reviewed at that time. Let me know if you have any questions and talk to you soon,

Kellen

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From: Robert Strope [<mailto:RStrope@cityoflagrande.org>]
Sent: Friday, April 27, 2018 9:43 AM
To: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Subject: RE: B2H ApASC Completeness Review Update and City Comments

Kellen,

The City of La Grande would like to provide additional comments regarding IPC response, specifically, we want to identify route and road improvements that will be required to provide access to the proposed or Morgan Lake alternative routes and to request the use of H Frame towers in any view sheds that can be observed from Morgan Lake or the City of La Grande. We also want to ask that a condition be added to require IPC to go through the City's permitting process if they later decide to add the MUA back into our jurisdiction. The statement that they have been removed and therefore the issue us mute is fine provided they can't later amend the application to put them back in without adhering to our standards. I was unsure of the format for our response.

Robert

Robert A. Strope, MPA
City Manager
City of La Grande
rstrope@cityoflagrande.org
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From: TARDAEWETHER Kellen * ODOE [<mailto:Kellen.Tardaewether@oregon.gov>]
Sent: Friday, April 13, 2018 9:33 AM
To: Robert Strope <RStrope@cityoflagrande.org>
Subject: B2H ApASC Completeness Review Update and City Comments

Good Morning Robert,

I hope you have been well. There is a lot of information in this email, thank you in advance for your patience getting through it!

The Boardman to Hemingway Transmission Line (B2H) proposed facility is undergoing the completeness review by the Oregon Department of Energy (ODOE) for its Amended Preliminary Application for Site Certificate (ApASC). The completeness review conducted by ODOE, reviewing agencies, Special Advisory Groups, and Tribal Governments, is the review to verify that the information required, outlined in OAR 345-021-0010 (Contents of an Application), is present in the application materials.

The City of La Grande, on behalf of the La Grande City Council, submitted comments and Requests for Additional Information (RAI's) on the ApASC. Attached is an ODOE compiled document with the City of La Grande comments and RAI's with Idaho Power (IPC) responses. It is understood by IPC that the edits provided in these tables shall be reflected in the complete application. Please review this document and notify me by April 27, 2018 if there is any missing or incomplete information *specific to OAR 345-021-0010*.

Here is a link to the rule language that outlines the necessary information required for each exhibit, as it pertains to completeness (OAR 345-021-0010):

https://secure.sos.state.or.us/oard/displayDivisionRules.action;JSESSIONID_OARD=cEvl4-1cwJkYFPai2eKxcwHAUj20YEiO_RiPf4ZhVo_kY-DY712!1243901809?selectedDivision=1578

Please keep in mind that per OAR 345-015-00190(5), *an application is complete when the Department finds that the applicant has submitted information adequate for the Council to make findings or impose conditions on all applicable Council standards*. The application completeness review is a separate step from the compliance review phase, as discussed below.

Please note that the City of La Grande will have an additional opportunity to comment on the application during the “compliance review”. If the ApASC is deemed complete by ODOE, the complete Application for Site Certificate (ASC) will be distributed to all reviewing agencies. ODOE will send notice to reviewing agencies, Special Advisory Groups, and Tribal Governments that the application is complete and requests the reviewing agencies submit an agency report. OAR 345-015-0200(4), outlines the items that ODOE requests to be included in the report.

These items are:

OAR 345-015-0200 (Notice to Agencies that the Application is Complete)

(4) Request an agency report containing the following information:

- (a) The agency's recommendations regarding any applications for permits administered by the agency that are applicable to construction or operation of the proposed facility.
- (b) Issues significant to the agency.
- (c) The agency's conclusions concerning the proposed facility's compliance with state statutes, administrative rules or ordinances administered by the agency.
- (d) A list of site certificate conditions recommended by the agency.
- (e) Any other information that the reviewing agency believes will be useful to the Council in reviewing the site certificate application.

ODOE generally refers to this as the “compliance review.” The comments submitted during this review are on-the-record and ODOE uses this information, information within the ASC, and agency comments to draft the findings in the Draft Proposed Order (DPO). Please also keep in mind that the comments submitted during the compliance review may include recommended conditions of approval, as well as any necessary conditions of approval recommended by ODOE itself, and they could vary with what IPC has proposed in the ASC. We will fairly present to EFSC IPC's represented conditions, and any differences in condition language if recommended by ODOE or reviewing agencies.

If the ApASC is deemed complete, ODOE will send the abovementioned notice which will also have information about public informational meetings. ODOE will hold public informational meetings on the complete application and EFSC review process in each of the five counties proposed to be crossed by B2H. ODOE will coordinate with the Counties for the meetings.

Finally, I will be providing EFSC an update on the B2H proposed facility as an informational item at the April EFSC meeting. The EFSC meeting is on April 27, in The Dalles. Specific meeting details will be posted to the website in the coming days. <http://www.oregon.gov/energy/facilities-safety/facilities/Pages/Council-Meetings.aspx>

Let me know if you have any questions. Thank you,

Kellen

Kellen Tardaewether

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TARDAEWETHER Kellen * ODOE

From: Robert Strobe <RStrobe@cityoflagrande.org>
Sent: Friday, April 27, 2018 12:02 PM
To: TARDAEWETHER Kellen * ODOE
Subject: April 27 2018 Letter to DOE B2H City of La Grande reply to IPC Responses for additional information Preliminary Application for submission
Attachments: April 27 2018 Letter to DOE B2H City of La Grande reply to IPC Responses for additional information Preliminary Application for submission.pdf

Kellen,

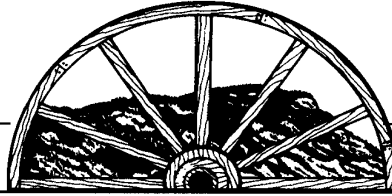
Attached is the City of La Grande's reply to Idaho Power's response. Please call me if you have any questions.

Robert

Robert A. Strobe, MPA
City Manager
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rstrobe@cityoflagrande.org
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(541) 963-3333 fax

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CITY OF



LA GRANDE

THE HUB OF NORTHEASTERN OREGON

MEMORANDUM

TO: Kellen Tardaewether
Oregon Department of Energy
550 Capitol St. N.E., 1st Floor
Salem, OR 97301

FROM: Robert A. Strobe, City Manager
City of La Grande, Oregon
P.O. Box 670
1000 Adams Avenue
La Grande, OR 97850
(541) 962-1309
rstrobe@cityoflagrande.org

DATE: April 27, 2018

RE: Idaho Power Responses to City of La Grande Comments on the Amended Preliminary Application for Site Certification for the Boardman to Hemingway Transmission Line

General Comments: The La Grande City Council renews our objection to the Proposed Route in the preliminary application and again strongly requests that Idaho Power remove the Proposed Route from their application and instead use the Morgan Lake Alternative or ideally reconsider the BLM preferred route. As we stated previously, of the two routes identified in the application, the applicant selected the one most impactful to the City of La Grande as their Proposed Route. In their response Idaho Power states they intend to construct on the route that has the most support from the local community. The local community does not support the B2H project as evidenced by the overwhelming adverse public response each time the topic is on an agenda. Therefore Idaho Power is unlikely to get community support for any route as it will be perceived as support for the project. Perhaps another way to put it, the La Grande City Council, which represents over the more than 13,000 residents who are in closest proximity to B2H, has stated they object more to the Proposed Route than the Morgan Lake Alternative. This should be more than sufficient for Idaho Power to remove the Proposed Route from their application.

The City of La Grande is disappointed that the Idaho Power response to our comments repeatedly reference a lack of specific deficiencies given one of the main points we and other jurisdictions have made is the preliminary application itself does not provide sufficient information in many areas to adequately review what they are proposing to construct as we would with a normal land use application that had detailed site plans.

Given the lack of detail contained in the preliminary application, we would ask that conditions of approval be included to protect the City's interests and avoid any disputes in the future should the project be approved. Some specific conditions we are requesting are shown in bold in the following paragraphs. Idaho Power could also revise their application to include these to streamline the process.

Below are additional comments regarding the Idaho Power response:

Exhibit T – Recreation.

View Shed Concerns of Morgan Lake Park with respect to possible impacts of B2H power line construction in close proximity to the park:

Despite the detailed information provided by Dr. Karen Antell, PhD, Professor of Biology, Eastern Oregon University in our previous submission, Idaho Power's states that we have not provided evidence of impacts the line may have on Morgan Lake. It is difficult to be more precise on impacts given the lack of detail in the Idaho Power preliminary application that we pointed out. Their submission lacks details regarding how they plan to access the line during construction, the types and quantities of equipment that will travel up Morgan Lake Road during construction. Idaho Power's staff acknowledged during public meetings that the towers would be an impact on the view shed but that people would get used to it over time. We would ask that Idaho Power be required to provide evidence that such a project does not adversely impact an amenity such as Morgan Lake. Another option would be for Idaho Power to consider physical improvements at Morgan Lake to enhance the recreational experience and help offset the view shed impacts.

At a minimum, the City would ask that if the project is approved, a condition of approval would include that for the approximately 1.5 miles of the line that would be in view from Morgan Lake that H Frame towers be used to help mitigate the adverse impact to the view shed. If the Proposed Route is selected instead of the Morgan Lake Alternative, a condition of approval should be added to require H Frame towers in the view shed visible from the City of La Grande. Again, the City of La Grande adamantly opposes the Proposed Route and would ask Idaho Power to remove it from their application.

Exhibit U – Public Services include utilities such as road systems, water, sanitation services, power, and other amenities necessary for the construction.

If Morgan Lake Road will be used for construction access, for the safety of the public and Idaho Power's construction crews, the City of La Grande requests that a condition of approval be included to require Idaho Power to widen Morgan Lake Road to a standard 22 foot width from the end of the asphalt in the vicinity of 91 Walnut to the end of the road with guardrails from Skyline Drive to Marvin Road. Given the grade and winter conditions, asphalt would not be the preferred surface, but rather a minimum 6 inch thick rock and gravel surface using base rock from Harney Rock & Paving Company, Haines, Oregon, which has proven to be ideally suited to the existing conditions on this road. **If Glass Hill will be used for construction access, it would also need to be improved to these same standards with the addition of improving the intersection of Glass Hill and Morgan Lake Road to allow for left turns from Glass Hill onto Morgan Lake Road.** Glass Hill would not require guard rails. Soil stabilization, slide areas, and improved drainage will be required to be addressed as part of needed improvements to accommodate construction traffic, as well as the use of Mag Chloride

for dust control and to aid in the stabilization. Union County Public Works can provide more detailed information regarding the standards.

Route for construction traffic, both proposed and Morgan Lake Alternative: **If the project is approved, in addition to the actions Idaho Power stated they would be taking regarding traffic, the City would ask that as a condition of approval Idaho Power will use the following route: From Highway 30 to Gekeler Lane to C Avenue to Walnut Street to Morgan Lake Road to Glass Hill Road. Further, that prior to the start of construction, the section of C Avenue from the intersection of C Avenue and Sunset and the section of Walnut from Morgan Lake Road to C Avenue be improved to City of La Grande Class I standards to accommodate the construction traffic and restored if needed upon completion of the project. Also, that Idaho Power be required as a condition of approval to repair any damage resulting from their vehicles and equipment that occur during construction and that upon completion of construction all infrastructure be restore to as good or better than it was prior to construction.**

**B2HAPPDoc ApASC Reviewing Agency Comment DOGAMI to IPC Responses_Wang
2018-02-16**

TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Friday, February 16, 2018 1:57 PM
To: 'Stokes, Mark'; Stanish, David
Cc: English, Aaron; WOODS Maxwell * ODOE (Maxwell.Woods@oregon.gov)
Subject: FW: B2H - Exhibit H - Idaho Power's responses to reviewing agency comments

Please see DOGAMI's response to IPC's Responses to Exhibit H and DOGAMI RAI's. Thanks,

Kellen

Kellen Tardaewether

Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
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From: WANG Yumei * DGMI
Sent: Friday, February 16, 2018 1:54 PM
To: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Cc: WANG Yumei * DGMI <Yumei.WANG@oregon.gov>
Subject: Re: B2H - Exhibit H - Idaho Power's responses to reviewing agency comments

Kellen,

Thanks for this gentle reminder.

DOGAMI is satisfied with Idaho Power's responses and has no further comments.

Yumei

On Feb 16, 2018, at 1:32 PM, TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov> wrote:

Hi Yumei,

I know we have bombarded you with comment requests for some EFSC facilities. But I'm re-forwarding Idaho Power's responses to DOGAMI's comments on the B2H ApASC. Will you have time to provide feedback on these? I really appreciate it and hope you have a nice weekend!

Kellen

Kellen Tardaewether

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From: TARDAEWETHER Kellen * ODOE
Sent: Friday, February 2, 2018 3:20 PM
To: WANG Yumei * DGMI <Yumei.WANG@oregon.gov>
Cc: BURNS Bill * DGMI <Bill.BURNS@oregon.gov>; WOODS Maxwell * ODOE (Maxwell.Woods@oregon.gov) <Maxwell.Woods@oregon.gov>
Subject: FW: B2H - Exhibit H - Idaho Power's responses to reviewing agency comments

Good afternoon Yumei,

It's been a little while since we spoke last. I know Idaho Power (IPC) has been in contact with you regarding the B2H facility and the EFSC completeness review. Attached are the IPC responses to reviewing agency and DOGAMI comments and RAI's. For the completeness review, IPC sends ODOE and agencies responses to comments and RAI's in this table format. We do not request redlines and, once sufficient, the responses shall reflect what will be in the complete application. In this context IPC's responses are targeted toward what information is necessary for this completeness review phase. That said, could you review their responses and let us know your thoughts? I'll touch bases with you next week to discuss as well. Thanks and have a good weekend.

Kellen

Kellen Tardaewether

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<2018-02-01 - B2H - Exhibit H - IPC Responses to Reviewing Agencies.pdf>

Idaho Power's Response to Reviewing Agency Comments
Exhibit H – Geology
Boardman to Hemingway Transmission Line Project
February 2018

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
City of La Grande ¹	General Comment		The south and west hills of La Grande have been classified by the adopted engineering report titled "Engineering Geology of the La Grande Area, Union County, Oregon", dated 1971, as a geological hazard area. The study addresses numerous fault lines from Sheep Creek to and through the La Grande area, which covers the area submitted for site selection. That document is attached and supports concerns for all work proposed within the submitted study area. This plan is addressed in the City of La Grande Comprehensive Plan in addressing Goal 7.	As requested, Idaho Power revised Exhibit H, Attachment H-1 to include a new section, Section 4.4, which addresses the report "Engineering Geology of the La Grande Area, Union County, Oregon", dated 1971. Section 4.4 states: <u>As part of our study, we reviewed DOGAMI's open file report: Engineering Geology of the La Grande Area, Union County, Oregon, by Schlicker and Deacon (1971). The study identified several northwest-trending faults in the area west and south of La Grande. Faults shown on the Geologic Map sheets in Appendix A are based on more recent studies compiled in Ferns and others (2010). The fault locations shown in Ferns and others (2010) are similar to, although not exactly the same as, those mapped by Schlicker and Deacon (1971). The differences between the fault maps are due to improvements in the understanding of local stratigraphy over time. The only faults within the area mapped by Schlicker and Deacon (1971) that are recognized by the USGS as having been active within the Quaternary period are those of the West Grande Ronde Fault Zone, which is discussed in Section 4.2.3. Current mapping of the West Grande Ronde Fault Zone, consistent with Ferns and others (2010), is shown and labeled on the Geologic Map sheets in Appendix A.</u>
DOGAMI ²	General Comment		The Amended Preliminary ASC does not adequately address or propose to adequately address the local seismic sources, seismic ground motions, fault surface rupture hazard, and co-seismic effects including landslides, liquefaction, lateral spreading, and settlement along the numerous faults in the proximity of the proposed route. The Applicant's use of a national dataset is not adequate for site specific evaluation. The ASC needs to address or propose to adequately address the earthquake hazard that can impact the proposed facilities.	This particular comment does not include any specific information request and therefore no specific text or information revisions are necessary based on this comment alone. That said, the seismic design of the transmission towers will not control the transmission tower design. The American Society of Civil Engineers (ASCE) Guidelines for Electrical Transmission Line Structural Loading

¹ The City of La Grande submitted comments on the Amended Preliminary Application for Site Certificate to ODOE on or about August 31, 2017.

² The Oregon Department of Geology and Mineral Industries (DOGAMI) submitted comments on the Amended Preliminary Application for Site Certificate to ODOE on or about September 15, 2017.

Idaho Power's Response to Reviewing Agency Comments
Exhibit H – Geology
Boardman to Hemingway Transmission Line Project
February 2018

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				<p>(manual 74, 2010) states:</p> <p>Transmission structures need not be designed for ground-induced vibrations caused by earthquake motion; historically, transmission structures have performed well under earthquake events, and transmission structure loadings caused by wind/ice combinations and broken wire forces exceed earthquake loads. This may not be the case if the transmission structure is partially erected or if the foundations fail due to earth fracture or liquefaction.</p> <p>Transmission structures are designed to resist large, horizontal loads of wind blowing on the wires and structures. These loads and the resulting strengths provide ample resistance to the largely transverse motions of a majority of earthquakes. Decades of experience with lines of all sizes have shown that very infrequent line damages have resulted from soil liquefaction or when earth failures affect the structural capacity of the foundation.</p> <p>Exhibit H provides that Idaho Power will review site specific geo-seismic hazards at each tower site as necessary and consistent with ASCE manual 74 (2010) guidelines, which is the standard of practice used by structural engineers for power line design. The individual tower assessments for geo-seismic hazards will be performed during final design phases. Idaho Power will rely on the published available resources on known faults that may cause a direct displacement on the towers' foundations. The geo-seismic hazards, including landslide, lateral spreading, liquefaction, and surface rupture or settlement will be further evaluated using the subsurface conditions identified through a planned geotechnical exploration program. For those soil failures, Idaho power will use the latest available USGS probabilistic seismic hazard analysis, 2014, to obtain 500-, 2,500-, and 5,000-year return period ground acceleration motions for the evaluation. This approach is consistent with the EFSC rules and standards.</p>

**Idaho Power's Response to Reviewing Agency Comments
 Exhibit H – Geology
 Boardman to Hemingway Transmission Line Project
 February 2018**

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				<p>While Idaho Power appreciates DOGAMI's quest to gather fine-scale site-specific geological data, DOGAMI has failed to show how that scale of data is necessary to meet EFSC standards or requirements, and perhaps more importantly, DOGAMI has failed to provide any evidence that such fine-scale data is necessary from an engineering perspective to ensure protection of the facility. For example, DOGAMI's suggestion that Idaho Power use seismic sources not included in the national seismic hazard maps is unsupported by industry practice and is an unnecessary, overly-cautionary step for defining the structural design load. DOGAMI has provided no evidence that such data is necessary to ensure the facility will not be impacted by geological hazards or to ensure the facility will not impact the public or the environment. Without that showing, DOGAMI's requests are not relevant to the letter or intent of the EFSC standards and rules, and rather appear to be data requests intended simply for the sake of gathering data.</p>
	<p>General Comment</p>		<p>The Amended Preliminary ASC Methods does not refer to current standards, references and information. As two examples, the current versions of NESC and ASCE-7 should be considered.</p> <p>Also, as already mentioned in DOGAMI's March 31, 2016 letter to ODOE, the most recent information on regional seismic studies at the U.S. Department of Energy's Hanford Site and Columbia and Snake River dams should be considered.</p>	<p>As requested, Idaho Power revised Exhibit H to address current codes and how they apply to the geotechnical, geologic, and geo-seismic components of the project. Those changes occur throughout the exhibit.</p> <p>Attachment H-1 has been revised to include a discussion which addresses the regional seismic studies at U.S. Department of Energy's Hanford Site and Columbia and Snake River dams. Section 4.8 of Attachment H-1 states:</p> <p><u>As part of our study, we reviewed two regional seismic studies: the Hanford Sitewide Probabilistic Hazard Analysis (PNNL, 2014), and the Probabilistic Seismic Hazard Analysis for the Mid-Columbia Dams (URS and others, 2012). The Hanford Sitewide Probabilistic Hazard Analysis was prepared for the U.S. Department of Energy by the Pacific Northwest National Laboratory</u></p>

Idaho Power's Response to Reviewing Agency Comments
Exhibit H – Geology
Boardman to Hemingway Transmission Line Project
February 2018

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				<p><u>(PNNL). It updated a previous seismic hazard analysis for the Hanford Site and included collection of new field data, which PNNL used for seismic source characterization.</u></p> <p><u>The Probabilistic Seismic Hazard Analysis for the Mid-Columbia Dams was prepared for the Public Utility Districts of Chelan, Douglas, and Grant Counties, Washington, by numerous consultants. The scope of the latter study did not include acquisition of new field data.</u></p> <p><u>Both studies will be considered in the seismic hazard analysis for final design of the Boardman to Hemingway 500kV Transmission Line Project.</u></p>
	General Comment		<p>The Amended Preliminary ASC Site-specific Geotechnical Work (section 3.4 on Page H-6 and 7) and Locations of Geotechnical Work (section 3.6 on Page H-9) specify boring locations along the alignment but does not specifically include Quaternary faults and fault zones. Additional subsurface exploration should be considered at fault and fault zones and locations where ground shaking can influence the site response, such as river crossings and near drainages with softer soil conditions.</p>	<p>In Exhibit H, Attachment H-1, Section 4.2.1, Idaho Power already discusses in detail quaternary faults. No edits are necessary.</p> <p>With respect to DOGAMI's subsurface exploration comments, during the planned geotechnical exploration program, Idaho Power will complete borings at river crossings and review the proposed boring locations regarding areas of soil deposits where geo-seismic hazards such as liquefaction and lateral spreading may occur and at tower locations nearest to mapped quaternary faults. Borings will be added as necessary. No edits are necessary.</p>
	General Comment		<p>The Amended Preliminary ASC does not adequately address or propose to adequately address landslide hazard along the proposed right of way. We recommend the collection of high resolution lidar data along the route. The lidar should be collected with enough buffer distance from the route so that the lidar data can be used to evaluate the geologic hazards properly. For example, for landslide hazards the lidar data is needed from the valley bottom to the top of the ridge.</p>	<p>Idaho Power will conduct LiDAR or ground survey analysis of the entire site boundary. This will include detailed survey analysis 250 feet on either side of the transmission line centerline; this approach is consistent with industry standards and sufficient to identify potential geotechnical hazards based on the industry's decades-long experience building and maintaining transmission lines (see Exhibit H, Section 3.8.5). The Project is intending to gather LiDAR data 0.5 miles either side of the project centerline. To the extent DOGAMI is suggesting that LiDAR is necessary beyond these parameters, DOGAMI has provided no evidence to show that the same is necessary to meet EFSC standards or rules or is consistent with industry standards (see Exhibit H, Attachment H-1, Section 4.1 (considering the IBC 2015, OSSC 2014)).</p>

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February 2018

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				Again, without that showing, DOGAMI's requests are not relevant to the letter or intent of the EFSC standards and rules, and rather appear to be data requests intended simply for the sake of gathering data.
	General Comment		The Amended Preliminary ASC proposes to adequately address the current International Building Code, Oregon Structural Specialty Code, and Guidelines for Geologic Hazard Evaluations in Oregon. We recognize that the EFSC Structural Standards for siting facilities have not been updated with the current State of Oregon Building codes, therefore we recommend that the Applicant address both the EFSC Structural Standards and the current codes, such as those listed below: <ul style="list-style-type: none"> • International Building Code 2015 • Oregon Structural Specialty Code 2014 • Guidelines for Preparing Engineering Geology Reports • American Society of Civil Engineers (ASCE) 7-16 	As requested, Idaho Power revised Exhibit H to address current codes including, EFSC Structural Standards, IBC 2015, OSSC 2014, and ASCE 7-16 and how they apply to the geotechnical, geologic, and geo-seismic components of the project. Those changes occur throughout the exhibit. Additionally, Attachment H-1, Section 3.2, has been revised to include a discussion which addresses Guidelines for Preparing Engineering Geology Report.
	General Comment		In the Amended Preliminary ASC on page H-8 line 3 8-3 9, it says "You were aware that in transmission line construction, design for wind and ice forces is more than sufficient to account for typical seismic forces We are generally aware that sometimes other forces can be significant. However, it is the applicant's responsibility to properly evaluate the possible forces and effects, including seismically induced liquefaction and landslides, and design and construct accordingly.	Idaho Power disagrees with DOGAMI's assertion that the exhibit does not sufficiently address the hazards listed in this comment. Exhibit H and its attachments are full of specific, thorough information related to the hazards. Further, DOGAMI has not identified any specific information that it believes is necessary for completeness—that is, DOGAMI has not identified any specific omissions, deficiencies, or additional information that DOGAMI believes is necessary for completeness. Rather, DOGAMI simply makes broad, general statements that the exhibit is deficient. Because DOGAMI has not requested any specific information and has not shown how that information would be necessary to address any specific EFSC standard, this comment does not raise any issues related to application completeness and no changes to the application are necessary.
	General Comment		In Attachment H-1 (Shannon and Wilson report, dated December 7, 2016), Table 1 provides 5,000-year return period peak ground accelerations at seven locations to represent the entire proposed facilities. Additional locations at key geologic features, such as	Idaho Power revised Attachment H-1 to address this by removing Table 1 and instead presenting contour maps for 5,000-year return period peak ground accelerations (see e.g., Attachment H-1, App'x D, Figure D10). The data to produce these

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			near faults, and at facilities, such as substations, communication sites, and multiuse areas, are needed.	maps were recently made available by the USGS. By presenting these contour maps, the 5,000-year PGA variation is provided for a broader area than that 7 site locations in former Table 1.
	Multiple Locations, including 2016 ApASC page H-9 and June 2017 ApASC Section 3.4 page H-7 and Section 3.6 page H-9		The reference to faults was removed from the ApASC dated January 2016, Exhibit H, page H-9 line 25, and "Areas near Quaternary faults" was not included in the updated June 2017 ApASC on page H-7. Quaternary faults need to be evaluated for seismic hazards and risk. Seismic hazards include ground shaking and secondary hazards, including permanent ground displacement. Please include Quaternary faults with a relevant discussion in the ApASC and relevant supporting documentation.	Exhibit H, Attachment H-1, Section 4.2.1 already addresses quaternary faults. No edits are necessary.
	Multiple locations, including ApASC, in the Table C1: Summary of Proposed Borings, Section 3.4 page H-7 and Section 3.6 page H-9, and other relevant supporting documentation e.g., Appendix B: Soils Data Table and Maps and Appendix D: Seismic Evaluation		Boring locations should be selected with consideration of fault locations and hazards, including rupture, liquefaction, lateral spreading, co-seismic landslides, and settlement, and the proposed facilities, including towers, substations, communication sites, roads, multi-use areas, fly yards and other sites. Please include fault locations and hazards in a discussion in the ApASC and in the Table C1: Summary of Proposed Borings, and other relevant supporting documentation. Please refer to the faults in a manner that makes it clear to the reader the location of the faults, e.g., refer to the faults by name and location such as shown on Figure D9. Provide additional maps where needed.	Idaho Power has revised Attachment H-1, Section 3.1, to include new criteria such as geo-seismic hazard and proximity to faults as follows: In general, criteria for boring placement included borings at the following: ... ➤ <u>Locations for potential geo-seismic hazards such as liquefaction, lateral spreading, and seismic slope instability.</u> Additionally, Idaho Power has revised Attachment H-1 to add proposed boring locations in areas of soil deposits where geo-seismic hazards such as liquefaction and lateral spreading may occur and at tower locations nearest to mapped Quaternary faults. In Table C1 of Attachment H-1, headings for geo-seismic hazards and towers adjacent to faults were added.
	Multiple locations, including ApASC Section 3.8, page H-10 lines 8 and 40 and Appendix D: Seismic Evaluation		The peak ground accelerations (PGA) for a 5000 year recurrence interval are to be provided. The Applicant states that "5,000-year return period have been included in this evaluation and are shown in Attachment H-1." Table 1 in Attachment H-1 includes PGA values for only 7 locations, and does not provide a map of the locations. A map of the locations with respect to the Quaternary faults	Idaho Power revised Attachment H-1 to address this by removing Table 1 and instead presenting contour maps for 5,000-year return period peak ground accelerations (see e.g., Attachment H-1, App'x D, Figure D10). The data to produce these maps were recently made available by the USGS. By presenting these contour maps, the 5,000-year

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			should be provided. The Applicant presents ground motions in Figures D-2, D3, D4, D6, D7 and D8 are for a 2,500 year return period. Additional locations for PGA, including at proposed substations and other key facilities, at a closer spacing and at key geologic features, such as near faults, are needed. In areas with softer soils, such in flood plains and certain river crossings, ground motions and their effects from site soils need to be characterized.	PGA variation is provided for a broader area than that 7 site locations in former Table 1.
	Section 3.8 Page H-10 Lines 38 and 39		The Applicant states: "the seismic sources are not mapped sufficiently to perform a deterministic evaluation of ground motions along a several hundred-mile-long powerline alignment." The Applicant will need to map and characterize the hazards from any seismic sources that are not sufficiently mapped to ensure that the proposed facilities can be designed and constructed to ensure reasonable public safety.	Idaho Power disagrees with DOGAMI's assertion that the exhibit does not sufficiently address or map the hazards listed in this comment. There's no reason to map those areas where the hazards are not significant. And, as discussed above, DOGAMI has provided no evidence that such data is necessary to ensure the facility will not be impacted by geological hazards or to ensure the facility will not impact the public or the environment. Without that showing, DOGAMI's requests are not relevant to the letter or intent of the EFSC standards and rules, and rather appear to be data requests intended simply for the sake of gathering data.
	Attachment H-1, Section 4.2.1 Quaternary Faults. On page 69 of 237 pf Part 1 pdf and Table D1 on page 88 of 157 of Part 2 pdf		The Applicant states: "These Quaternary faults within an approximate 5-mile radius of the proposed alignments are also summarized in Appendix D, Table D1." A 5 miles radius is insufficient to characterize the seismic hazards. Please expand to include all Quaternary fault sources that could impact the proposed facilities. Also, please provide a description of the faults that could impact the proposed facilities. For example, please include the large east-west trending fault zones in Washington state.	The 5-mile radius is used to evaluate faults which may contribute to fault rupture hazard only. The ground shaking contribution for faults outside of the 5-mile radius is already included in the current USGS hazard maps. DOGAMI has provided no evidence to support its assertion that this approach is insufficient or inconsistent with the EFSC standards or rules, or with industry standards. Exhibit H, Attachment H-1, Section 4.2 already sufficiently addresses faults, with quaternary faults being addressed specifically in Section 4.2.1. If DOGAMI would like Idaho Power to consider additional faults not already discussed in the exhibit or its attachments, DOGMAMI must identify those faults specifically and provide evidence demonstrating how they're relevant to the project including from an engineering and design perspective. Data requests intended simply for the sake of gathering data are insufficient.

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Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
	Section 3.8 Page H-10		The Applicant states: "Generally NESC-mandated combined ice and loading cases have been determined by the industry to be sufficient to address seismic hazards from earthquakes." This statement is misleading, and the Applicant must characterize and evaluate seismic hazards from earthquakes including shaking and seismically-induced ground failures. This includes co-seismic slope stability, liquefaction, cyclic strain, and lateral spreading. Electrical equipment at substations have been damaged by earthquake ground shaking. In Addition to earthquake forces, the loading conditions in the January 2017 winter storm were anecdotally reported to be higher than in the current IBC design maps; thus historic loading conditions should be considered in addition to building code requirements.	<p>Exhibit H, Attachment H-1 addresses each of the seismic events listed in OAR 345-021-0010(1)(h). This comment fails to allege otherwise or to request any specific information required by the EFSC rules. That being so, no edits are necessary.</p> <p>That said, slope stability is addressed throughout Attachment H-1, liquefaction and lateral spreading are addressed in Section 4.5.3, and cyclic shearing is also addressed in Section 4.5.3.</p> <p>Additionally, DOGAMI's reliance on anecdotal reports of loading in January 2017 is insufficient to show that building standards above the IBC are required. DOGAMI provides no scientific data to supports its anecdotes or to show that the IBC standards were insufficient to address the loading of those anecdotal conditions (if true). Again, DOGAMI cannot demand information based on unsubstantiated, conclusory hunches or wants. The requests must be relevant to the EFSC standards and rules, and must have a rationale connection to the intent of the same.</p> <p>No edits are necessary.</p>
	Attachment H-1 Page 47-53.		Please update the Section 9 References. For example, burns et al and SLIDO 2 is included in the reference list. However, Appendix E refers to a SLIDO 3.2, which is later reference.	<p>As requested, Idaho Power revised the references to reflect the use of SLIDO version 3.4 as well as SLIDO version 2:</p> <p>Data sources for the inventory included the Statewide Landslide Information Database for Oregon (SLIDO), version 2 (Burns and others, 2011) and version 3.4 (Burns and Watzig, 2017), published geologic mapping, review of LiDAR data, review of aerial photographs, and limited site reconnaissance.</p>
	Section 3.8.5 Page H-16, Appendix E: Landslide Inventory. Page E-1		The Applicant is not clear about how they evaluated potential landslide hazards. They state that they "reviewed the majority of the transmission line route". They list data sources, including "Review of GIS files compiled by Oregon Department of	As requested, Idaho Power has revised the discussion of landslide evaluation methodology in Attachment H-1 to clarify the approach taken.

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			<p>Geology and Mineral Industries (DOGAMI) in the 2014 Statewide Landslide Information Database for Oregon (SLIDO), version 3.2". Please evaluate the entire route for landslide hazards, and describe the method of evaluation. For example, the Applicant has proposed to review landslide data compiled by DOGAMI using the SLIDO database, however, SLIDO is incomplete. Therefore, the Applicant must also do original landslide hazard evaluations where necessary. The Applicant must not solely rely on published data. The original landslide hazard evaluations can include mapping, borings, trenching and more to characterize landslide features and help with design for landslide mitigation.</p>	
	<p>Section 3.8.5 Page H-16 and Appendix E: Landslide Inventory. Page E-1</p>		<p>The Applicant states: "the review included landslides within a 1-mile wide route corridor". Please evaluate potential large landslides that may exceed the 1 mile wide route corridor. Landslides may extend from the tops of ridges and may move downslope to block rivers.</p>	<p>Idaho Power has not identified any areas relevant to this Project that indicate an analysis area greater than 1-mile is necessary. If DOGAMI has knowledge of specific areas along the Project where landslide risk extends beyond 1-mile, Idaho Power would welcome that information. In any event, DOGAMI has provided no evidence demonstrating that an analysis area greater than 1-mile is necessary for the entire Project or supported by industry practices. Therefore, the current level of landslide evaluation is adequate for completeness and to meet the EFSC standards, and no edits are necessary.</p>
	<p>Appendix E: Landslide Inventory. Page E-1</p>		<p>The Applicant states: "DOGAMI LiDAR Data Viewer (relevant LiDAR data was only available for portions of the Meacham Lake, Huron, Kamela SE, Hilgard, LaGrande SE, Glass Hill, Craig Mountain, North Powder, Telocaset, Baker, Virtue Flat, and Owyhee Dam quadrangles); no LiDAR data was available in Idaho." DOGAMI recommends the collection of high resolution lidar along the proposed route. Lidar coverage should be collected with enough buffer distance to characterize potential seismic and landslide hazards. For example, for landslide hazards, the lidar should include from the valley bottom to the top of the ridge. In addition, lidar can be used to evaluate seismic sources.</p>	<p>Idaho Power will conduct LiDAR or ground survey analysis of a corridor along the transmission line. That will nominally be 1 mile. The boundaries of this corridor will be extended for areas where warranted to analyze the hazard of landslides. Where it is unlikely that landslides are a hazard additional LIDAR data will not be obtained beyond the nominal 1 mile corridor (half mile either side of the centerline). This approach is consistent with industry standards and sufficient to identify potential geotechnical hazards based on Idaho Power's decades-long experience building and maintaining transmission lines (see Exhibit H, Section 3.8.5). To the extent DOGAMI is suggesting that LiDAR is necessary beyond these parameters, DOGAMI has provided no evidence to show that the same is necessary or consistent with industry</p>

**Idaho Power's Response to Reviewing Agency Comments
 Exhibit H – Geology
 Boardman to Hemingway Transmission Line Project
 February 2018**

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
				standards (see Exhibit H, Attachment H-1, Section 4.1 (considering the IBC 2015, OSSC 2014)).
	Section 3.8 Page H-10, H32 and H33		All design should use current, up-to-date, codes, standards, references, guidelines and best practices. However, as examples, the Applicant refers to ASCE 7-13 and IEEE's NESC Code C2-2007. The current version of these documents are ASCE7-16 and NESC 2017. Please use current industry standards for design, and provide references for them.	As stated above, Idaho Power revised Exhibit H to include a new section which addresses current codes.
	Section 3.8.5 Page H-15 and H33		The Applicant uses the 1996 OPS data to review the earthquake hazard zones to conduct a preliminary seismic risk assessment. The 1996 reference is outdated, and the method to develop earthquake hazard rankings is insufficient. The Applicant states; "To identify existing earthquake conditions the mileage crossed for each earthquake hazard risk (low, medium, or high) was mapped and expressed as a percent for each county." Please evaluate the hazard at the proposed sites and alignments.	Idaho Power removed reference to 1996 OPS data from Exhibit H. Attachment H-1 has been revised to include borings at locations where there is a potential for geo-seismic hazards such as at fault crossings. Site specific geo-seismic hazard evaluation will be conducted as part of final design once site specific data has been collected.
	Section 3.8.5 Page H-16		The Applicant states that "Prior to the development of final engineering design, liquefaction studies will be conducted for susceptible areas, including areas that cross or approach rivers and areas where thick unconsolidated sediments are encountered in the field". For liquefaction evaluations, recommendations in this reference, as well as other geotechnical references should be used: National Academies Liquefaction Study Report (2016) https://www.nap.edu/catalog/23474/state-of-the-art-and-practice-in-the-assessment-of-earthquake-induced-soil-liquefaction-and-its-consequences	Idaho Power did not use this reference because it is currently only a draft document and in no case binding on this Project.
	Section 3.8.5 Page H-17		The Applicant states that "For locations where liquefaction poses a risk, an assessment will be made to determine if lateral spreading would be an additional hazard." If the Applicant determines that lateral spreading is an additional hazard, the Applicant should design and describe mitigation measures.	Exhibit H, Attachment H-1, Section 6.2 presents typical mitigation techniques that would be appropriate if liquefaction and lateral spreading is found to be a geo-seismic risk, stating: For structures or towers which are located in areas that have a risk of liquefaction, there are a number of methods available to either adequately reduce the risk of liquefaction or to improve the performance of the structure (or improve

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				<p>resiliency), if liquefaction were to occur. Specific methods to reduce the liquefaction potential are ground densification to increase the soil's natural resistance to liquefaction, installation of drains to prevent excess ground water pore pressure build-up during a seismic event, and installation of soil-cement shear cells which reduce the seismic shearing demands on the soil.</p> <p>Alternative to the methods which improve the soils resistance to liquefaction described above, the foundations for structures may be designed to account for a layer of soil which may liquefy. Deep foundations can be designed to bypass the liquefiable layer, being founded on deeper layers.</p> <p>No edits are necessary.</p>
	Page H-17 Section 3.9.2 Flooding		The Applicant states that "Project roads would be permanent features and have permanent impacts in the flood zones." The Applicant will need to comply with requirements by local jurisdictions, including requirements by the County Flood Plain Managers and building departments. Building in the flood zone can alter the flood hazards and affect others. Road design and construction should be in accordance to best practices, and should consider impacts from flood hazards.	Local jurisdictional requirements related to flood zone construction and building are addressed in Exhibit K, and are outside of DOGAMI's jurisdiction. No edits are necessary.
	Page H-17 Section 3.9.2 Flooding and H-32		The Applicant states: "To evaluate flood hazards, DOGAMI Statewide Flood Hazard Database for Oregon – FEMA Flood Insurance Study inundation zones (2015) were compared to the temporary and permanent disturbance areas associated with the preliminary design." The Applicant should refer to FEMA websites for official flood data, including at https://msc.fema.gov/portal and not rely solely on DOGAMI's flood database.	FEMA's official flood data was reviewed for Umatilla and Morrow counties, because FEMA data was not available for remaining project counties including Union, Baker, Malheur or Owyhee counties. A reference to FEMA data has been added to the main text of Exhibit H. No additional edits are necessary since the data from FEMA was consistent with the data from DOGAMI.
Union County ³	UN-09 Project Order And		On September 22, 2017 the Council adopted new rules modifying OAR 345-021-0010, 345-022-0020, and 345-027-0020 that are applicable to the Boardman to Hemingway project. The staff report for the	Idaho Power revised Exhibit H and its attachments to address, and to be consistent with, the 2017 revisions to OAR 345-021-0010, 345-022-0020, and 345-050-0060.

³ Union County submitted comments on the Amended Preliminary Application for Site Certificate to ODOE on or about October 12, 2017.

Idaho Power's Response to Reviewing Agency Comments
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Boardman to Hemingway Transmission Line Project
February 2018

Reviewing Agency	Amended pASC Reference	Statute/Rule/Ordinance Reference	Comment or Request for Additional Information	Response
	Exhibit H		<p>rulemaking action clearly stated that “Absent any specific language stating otherwise, any and all changes that are approved in an EFSC rulemaking project (other than rules relating to the Council’s land use standard) become applicable to all in process applications for site certificates and all in process requests for amendment upon their effective date. The Council’s land use standard is the only EFSC rule that becomes fixed upon the date an application is submitted, or the date a request for amendment is submitted.”¹⁴ [emphasis added]</p> <p>Both the Project Order and Exhibit H (and elsewhere in the application, as applicable) should be modified to reflect these newly adopted rules.</p>	

B2HAPPDoc ApASC Reviewing Agency Comment DOGAMI_Wang 2017-09-15

TARDAEWETHER Kellen * ODOE

From: WANG Yumei * DGMI
Sent: Friday, September 15, 2017 11:04 AM
To: TARDAEWETHER Kellen * ODOE
Cc: WANG Yumei * DGMI
Subject: Dogami RAI on B2H
Attachments: B2H-dogami-RAI-9-15-17.pdf

Hi Kellen,

Please see the attached. If you require a hard copy, please let me know. Thanks!

Yumei

Yumei Wang, P.E. | Geotechnical Engineer
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Oregon

Kate Brown, Governor

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September 15, 2017

Kellen Tardaewether
Energy Facility Siting Analyst
Oregon Department of Energy
550 Capitol St NE, 1st floor
Salem, OR 97301

Re: DOGAMI request for additional information on the Amended Preliminary Application for Site Certificate, Boardman to Hemingway Transmission Line Project, dated June 2017

Dear Ms. Tardaewether,

The Oregon Department of Geology and Mineral Industries (DOGAMI) performed a review of the Boardman to Hemingway Amended Preliminary Application for Site Certificate (ASC) dated June 2017.

DOGAMI's review included Exhibit H: Geologic Hazards and Soil Stability and the appendices. The bases for the completeness review were a) professional standard-of-practice for characterization of geologic and natural hazards and b) relevant State of Oregon requirements. Specific Energy Facility Siting Council's (EFSC) rules and standards referenced in the completeness of the Amended Preliminary ASC include:

1. Oregon Administration Rule (OAR) 345-021-0010 on the Contents of the Application
2. OAR 345-022-0020 on the EFSC Structural Standard

Overall, DOGAMI finds the Amended Preliminary ASC to currently lack adequate geologic hazards and geotechnical information and/or the acknowledgment of future studies to be performed prior to permitting. Please refer to DOGAMI's request for additional information (RAI) table (attachment).

In addition, we note the following:

1) The Amended Preliminary ASC does not adequately address or propose to adequately address the local seismic sources, seismic ground motions, fault surface rupture hazard, and co-seismic effects including landslides, liquefaction, lateral spreading, and settlement along the numerous faults in the proximity of the proposed route. The Applicant's use of a national dataset is not adequate for site specific evaluation. The ASC needs to address or propose to adequately address the earthquake hazard that can impact the proposed facilities.

2) The Amended Preliminary ASC Methods does not refer to current standards, references and information. As two examples, the current versions of NESC and ASCE-7 should be considered. Also, as already mentioned in DOGAMI's March 31, 2016 letter to ODOE, the most recent information on regional seismic studies at the U.S. Department of Energy's Hanford Site and Columbia and Snake River dams should be considered.

3) The Amended Preliminary ASC Site-specific Geotechnical Work (section 3.4 on Page H-6 and 7) and Locations of Geotechnical Work (section 3.6 on Page H-9) specify boring locations along the alignment but does not specifically include Quaternary faults and fault zones. Additional subsurface exploration should be considered at fault and fault zones and locations where ground shaking can influence the site response, such as river crossings and near drainages with softer soil conditions.

4) The Amended Preliminary ASC does not adequately address or propose to adequately address landslide hazard along the proposed right of way. We recommend the collection of high resolution lidar data along the route. The lidar should be collected with enough buffer distance from the route so that the lidar data can be used to evaluate the geologic hazards properly. For example, for landslide hazards the lidar data is needed from the valley bottom to the top of the ridge.

5) The Amended Preliminary ASC proposes to adequately address the current International Building Code, Oregon Structural Specialty Code, and Guidelines for Geologic Hazard Evaluations in Oregon. We recognize that the EFSC Structural Standards for siting facilities have not been updated with the current State of Oregon Building codes, therefore we recommend that the Applicant address both the EFSC Structural Standards and the current codes, such as those listed below:

- International Building Code 2015
- Oregon Structural Specialty Code 2014
- Guidelines for Preparing Engineering Geology Reports
http://www.oregon.gov/osbge/pdfs/Publications/EngineeringGeologicReports_5.2014.pdf
- American Society of Civil Engineers (ASCE) 7-16

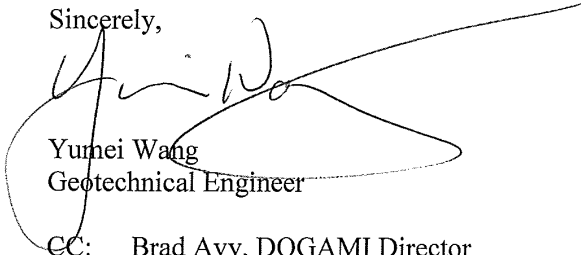
We recommend that the Applicant provide a discussion and recommendations where the results differ.

6) In the Amended Preliminary ASC on page H-8 line 38-39, it says "You were aware that in transmission line construction, design for wind and ice forces is more than sufficient to account for typical seismic forces We are generally aware that sometimes other forces can be significant. However, it is the applicant's responsibility to properly evaluate the possible forces and effects, including seismically induced liquefaction and landslides, and design and construct accordingly.

7) In Attachment H-1 (Shannon and Wilson report, dated December 7, 2016), Table 1 provides 5,000-year return period peak ground accelerations at seven locations to represent the entire proposed facilities. Additional locations at key geologic features, such as near faults, and at facilities, such as substations, communication sites, and multiuse areas, are needed.

Thank you for the opportunity to review the documents. If you have any questions, please contact me at 971-673-1551 (or yumei.wang@oregon.gov).

Sincerely,



Yumei Wang
Geotechnical Engineer

CC: Brad Avy, DOGAMI Director
Bill Burns, Geohazards Section Leader

Attachment: *DOGAMI RAI Table*

Boardman to Hemingway Transmission Line Project –Amended Preliminary Application for Site Certificate (ApASC)
DOGAMI

Request for Additional Information for the ApASC (ApASC RAI) Exhibit H – EXHIBIT Geological Hazards and Soil Stability
September 15, 2017

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021-, 345-022-0020 or other as indicated)	Request for Additional Information	Response
1 for ApASC RAI	Exhibit H	Multiple locations, including 2016 ApASC page H-9 and June 2017 ApASC Section 3.4 page H-7 and Section 3.6 page H-9		The reference to faults was removed from the ApASC dated January 2016, Exhibit H, page H-9 line 25, and “Areas near Quaternary faults” was not included in the updated June 2017 ApASC on page H-7. Quaternary faults need to be evaluated for seismic hazards and risk. Seismic hazards include ground shaking and secondary hazards, including permanent ground displacement. Please include Quaternary faults with a relevant discussion in the ApASC and relevant supporting documentation.	
2 for ApASC RAI	Exhibit H	Multiple locations, including ApASC, in the Table C1: Summary of Proposed Borings, Section 3.4 page H-7 and Section 3.6 page H-9, and other relevant supporting documentation e-g., Appendix B: Soils Data Table and Maps and Appendix D: Seismic Evaluation		Boring locations should be selected with consideration of fault locations and hazards, including rupture, liquefaction, lateral spreading, co-seismic landslides, and settlement, and the proposed facilities, including towers, substations, communication sites, roads, multi-use areas, fly yards and other sites. Please include fault locations and hazards in a discussion in the ApASC and in the Table C1: Summary of Proposed Borings, and other relevant supporting documentation. Please refer to the faults in a manner that makes it clear to the reader the location of the faults, e-g., refer to the faults by name and location such as shown on Figure D9. Provide additional maps where needed.	
3 for ApASC RAI	Exhibit H	Multiple locations, including ApASC Section 3.8, page H-10 lines 8 and 40 and Appendix D: Seismic Evaluation	OAR 345-021-0010(1)(h)(F)	The peak ground accelerations (PGA) for a 5000 year recurrence interval are to be provided. The Applicant states that “5,000-year return period have been included in this evaluation and are shown in Attachment H-1.” Table 1 in Attachment H-1 includes PGA values for only 7 locations, and does not provide a map of the locations. A map of the locations with respect to the Quaternary faults should be provided. The Applicant presents ground motions in Figures D-2, D3, D4, D6, D7 and D8 are for a 2,500 year return period. Additional	

**Boardman to Hemingway Transmission Line Project – Amended Preliminary Application for Site Certificate (ApASC)
 DOGAMI
 Request for Additional Information for the ApASC (ApASC RAI) Exhibit H – EXHIBIT Geological Hazards and Soil Stability
 September 15, 2017**

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021, 345-022-0020 or other as indicated)	Request for Additional Information	Response
4 for ApASC RAI		Section 3.8 Page H-10 Lines 38 and 39		<p>locations for PGA, including at proposed substations and other key facilities, at a closer spacing and at key geologic features, such as near faults, are needed. In areas with softer soils, such in flood plains and certain river crossings, ground motions and their effects from site soils need to be characterized.</p> <p>The Applicant states “the seismic sources are not mapped sufficiently to perform a deterministic evaluation of ground motions along a several hundred-mile-long powerline alignment.” The Applicant will need to map and characterize the hazards from any seismic sources that are not sufficiently mapped to ensure that the proposed facilities can be designed and constructed to ensure reasonable public safety.</p>	
5 for ApASC RAI	Exhibit H	Attachment H-1, Section 4.2.1 Quaternary Faults. On page 69 of 237 of Part 1 pdf and Table D1 on page 88 of 157 of Part 2 pdf		<p>The Applicant states “These Quaternary faults within an approximate 5-mile radius of the proposed alignments are also summarized in Appendix D, Table D1.” A 5 miles radius is insufficient to characterize the seismic hazards. Please expand to include all Quaternary fault sources that could impact the proposed facilities. Also, please provide a description of the faults that could impact the proposed facilities. For example, please include the large east-west trending fault zones in Washington state.</p>	
6 for ApASC RAI		Section 3.8 Page H-10		<p>The Applicant states: “Generally, NESC-mandated combined ice and loading cases have been determined by the industry to be sufficient to address seismic hazards from earthquakes.” This statement is misleading, and the Applicant must characterize and evaluate seismic hazards from earthquakes, including shaking and seismically-induced ground failures. This includes co-seismic slope stability, liquefaction, cyclic strain, and lateral spreading. Electrical equipment at substations have been damaged by earthquake ground shaking. In addition to earthquake forces, the loading conditions in the January 2017 winter</p>	

Boardman to Hemingway Transmission Line Project – Amended Preliminary Application for Site Certificate (ApASC) DOGAMI

Request for Additional Information for the ApASC (ApASC RAI) Exhibit H – EXHIBIT Geological Hazards and Soil Stability September 15, 2017

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				storm were anecdotally reported to be higher than in the current IBC design maps; thus historic loading conditions should be considered in addition to building code requirements.	
7 for ApASC RAI		Attachment H-1 Page 47-53.		Please update the Section 9 References. For example, Burns et al and SLIDO 2 is included in the reference list. However, Appendix E refers to a SLIDO 3.2, which is later reference.	
8 for ApASC RAI		Section 3.8.5 Page H-16, Appendix E: Landslide Inventory. Page E-1		The Applicant is not clear about how they evaluated potential landslide hazards. They state that they “reviewed the majority of the transmission line route”. They list data sources, including “Review of GIS files compiled by Oregon Department of Geology and Mineral Industries (DOGAMI) in the 2014 Statewide Landslide Information Database for Oregon (SLIDO), version 3.2” Please evaluate the entire route for landslide hazards, and describe the method of evaluation. For example, the Applicant has proposed to review landslide data compiled by DOGAMI using the SLIDO database, however, SLIDO is incomplete. Therefore, the Applicant must also do original landslide hazard evaluations where necessary. The Applicant must not solely rely on published data. The original landslide hazard evaluations can include mapping, borings, trenching and more to characterize landslide features and help with design for landslide mitigation.	
9 for ApASC RAI		Section 3.8.5 Page H-16 and Appendix E: Landslide Inventory. Page E-1		The Applicant states “the review included landslides within a 1-mile wide route corridor”. Please evaluate potential large landslides that may exceed the 1 mile wide route corridor. Landslides may extend from the tops of ridges and may move downslope to block rivers.	
10 for ApASC RAI		Appendix E: Landslide Inventory. Page E-1		The Applicant states “DOGAMI LiDAR Data Viewer (relevant LiDAR data was only available for portions of the Meacham Lake, Huron, Kamela SE, Hilgard, LaGrande SE, Glass Hill, Craig Mountain, North Powder, Telocaset, Baker, Virtue Flat, and Owyhee Dam quadrangles); No LiDAR	

Boardman to Hemingway Transmission Line Project –Amended Preliminary Application for Site Certificate (ApASC)
 DOGAMI
 Request for Additional Information for the ApASC (ApASC RAI) Exhibit H – EXHIBIT Geological Hazards and Soil Stability
 September 15, 2017

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021, 345-022-0020 or other as indicated)	Request for Additional Information	Response
				data was available in Idaho.” DOGAMI recommends the collection of high resolution lidar along the proposed route. Lidar coverage should be collected with enough buffer distance to characterize potential seismic and landslide hazards. For example, for landslide hazards, the lidar should include from the valley bottom to the top of the ridge. In addition, lidar can be used to evaluate seismic sources.	
11 for ApASC RAI		Section 3.8 Page H-10, H32 and H33		All design should use current, up-to-date, codes, standards, references, guidelines and best practices. However, as examples, the Applicant refers to ASCE 7-13 and IEEE’s NESC Code C2-2007. The current version of these documents are ASCE 7-16 and NESC 2017. Please use current industry standards for design, and provide references for them.	
12 for ApASC RAI		Section 3.8.5 Page H-15 and H33		The Applicant uses the 1996 OPS data to review the earthquake hazard zones to conduct a preliminary seismic risk assessment. The 1996 reference is outdated, and the method to develop earthquake hazard rankings is insufficient. The Applicant states “To identify existing earthquake conditions the mileage crossed for each earthquake hazard risk (low, medium, or high) was mapped and expressed as a percent for each county.” Please evaluate the hazard at the proposed sites and alignments.	
13 for ApASC RAI		Section 3.8.5 Page H-16		The Applicant states that “prior to the development of final engineering design, liquefaction studies will be conducted for susceptible areas, including areas that cross or approach rivers and areas where thick unconsolidated sediments are encountered in the field”. For liquefaction evaluations, recommendations in this reference, as well as other geotechnical references, should be used: National Academies Liquefaction Study Report (2016)	

Boardman to Hemingway Transmission Line Project – Amended Preliminary Application for Site Certificate (ApASC)
 DOGAMI
 Request for Additional Information for the ApASC (ApASC RAI) Exhibit H – EXHIBIT Geological Hazards and Soil Stability
 September 15, 2017

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021-, 345-022-0020 or other as indicated)	Request for Additional Information	Response
				https://www.nap.edu/catalog/23474/state-of-the-art-and-practice-in-the-assessment-of-earthquake-induced-soil-liquefaction-and-its-consequences	
14 for ApASC RAI		Section 3.8.5 Page H-17		The Applicant states that "For locations where liquefaction poses a risk, an assessment will be made to determine if lateral spreading would be an additional hazard." If the Applicant determines that lateral spreading is an additional hazard, the Applicant should design and describe mitigation measures.	
15 for ApASC RAI		Page H-17 Section 3.9.2 Flooding		The Applicant states that "Project roads would be permanent features and have permanent impacts in the flood zones." The Applicant will need to comply with requirements by local jurisdictions, including requirements by the County Flood Plain Managers and building departments. Building in the flood zone can alter the flood hazards and affect others. Road design and construction should be in accordance to best practices, and should consider impacts from flood hazards.	
16 for ApASC RAI		Page H-17 Section 3.9.2 Flooding and H-32		The Applicant states "To evaluate flood hazards, DOGAMI Statewide Flood Hazard Database for Oregon – FEMA Flood Insurance Study inundation zones (2015) were compared to the temporary and permanent disturbance areas associated with the preliminary design." The Applicant should refer to FEMA websites for official flood data, including at https://msc.fema.gov/portal and not rely solely on DOGAMI's flood database.	

B2HAPPDoc ApASC Reviewing Agency Comment Tribal Govt CTUIR_Quaempts

TARDAEWETHER Kellen * ODOE

From: Teara Farrow Ferman <TearaFarrowFerman@ctuir.org>
Sent: Friday, September 1, 2017 3:49 PM
To: TARDAEWETHER Kellen * ODOE
Subject: CTUIR Comments on B2H Amended Preliminary Application
Attachments: CTUIR Comments_B2H Amended Preliminary Application 9-1-17.pdf; Specific Comment - B2H.xlsx

Kellen,
Attached are the CTUIR comments.
Thank you,

TEARA FARROW FERMAN

The information in this e-mail may be confidential and intended only for the use and protection of the Confederated Tribes of the Umatilla Indian Reservation. If you have received this email in error, please immediately notify me by return e-mail and delete this from your system. If you are not an authorized recipient for this information, then you are prohibited from any review, dissemination, forwarding or copying of this e-mail and its attachments. Thank you.

From: TARDAEWETHER Kellen * ODOE [mailto:Kellen.Tardaewether@oregon.gov]
Sent: Thursday, June 29, 2017 3:21 PM
To: dlteeman.burns.paiute@gmail.com; robert.brunoe@ctwsbnr.org; roberta.kirk@ctwsbnr.org; Kathleen.sloan@ctwsbnr.org; Teara Farrow Ferman
Cc: WOODS Maxwell * ODOE
Subject: B2H Amended pASC Tribal Reviewing Agency Memo

Good afternoon,

The Oregon Department of Energy (ODOE) has received an electronic version of the Amended Preliminary Application for Site Certificate (Amended pASC) for the Boardman to Hemingway Transmission Line (B2H) project. The Applicant, Idaho Power (IPC), will begin sending reviewing agencies electronic copies today. In the next two weeks they will print and send the hard copies to agencies that have specified that they would like certain application exhibits or the entire application in a hard copy. If ODOE or IPC has not received written confirmation of a preference to receive application materials in electronic form, by default, reviewing agencies will receive materials in hard copy.

Attached is the Tribal Government Reviewing Agency Memo issued by ODOE. The memo provides the project background, outlines the EFSC process, as well as the request for Tribal review of the project. The comment deadline is September 1, 2017. This deadline is 45 days from July 19, 2017, which is when ODOE expects that all agencies will have received an electronic and/or hard copy of the application materials.

I will coordinate with all reviewing agencies for an interdisciplinary team meeting to provide an opportunity to discuss the project and the EFSC process. Let me know if you have any questions and I look forward to working with everyone.

Kellen

Kellen Tardaewether
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Leading Oregon to a safe, clean, and sustainable energy future.



Confederated Tribes *of the*
Umatilla Indian Reservation
Department of Natural Resources
46411 Timine Way, Pendleton, Oregon 97801

MEMORANDUM

To: Kellen Tardaewether, Senior Siting Analyst
Oregon Department of Energy
Sent via email to: kellen.tardaewether@oregon.gov

From: Eric Quaempts, Department of Natural Resources Director
Confederated Tribes of the Umatilla Indian Reservation
46411 Timine Way, Pendleton, OR 97801
EricQuaempts@ctuir.org
541-276-3447

Date: September 1, 2017

RE: Confederated Tribes of the Umatilla Indian Reservation's Comments on the Amended Preliminary Application (APA) for Site Certificate for the proposed Boardman to Hemingway Transmission Line

General Comments:

Thank you for contacting the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) regarding the Boardman to Hemingway Transmission Line amended preliminary application for site certificate. The CTUIR offers the following comments with the project.

The CTUIR has been working on this project with Idaho Power Corporation (IPC) and the BLM for almost ten years. Although we have dedicated hundreds of hours to improving the project, we do not feel that our input has been incorporated nor have explanations been forthcoming when our comments have been ignored.

Treaty Rights:

At no point does the APA mention the CTUIR Treaty of 1855 except summarizing comments without addressing them. In Exhibit BB the APA states that the project does not occur on reservation lands and concludes our concerns are addressed. Our concerns have not been addressed. Specifically, our Tribal Treaty Rights and resources concerns have been dismissed in the exhibits concerning habitat fragmentation, introduction of noxious weeds, effects on historic properties, noise, visual effects and cultural resource impacts. Our 2010 scoping comments to EFSC and BLM are attached to document the concerns of the CTUIR raised regarding impacts to treaty reserved rights and resources. Without discussing Treaty Rights the document fails to identify how these rights and resources are addressed. The Exhibits ignore that treaty rights are the supreme law of the lands under Article VI of the US Constitution and represent property

rights, protected under the due process clause of the Fifth and Fourteenth Amendments to the US Constitution.

In Exhibit BB, Page BB-8, Line 16-18 of the APA concludes that First Foods are “fully addressed under the Section 106 of the National Historic Preservation Act compliance process that will be memorialized in a Programmatic Agreement for the Project”. The Exhibit fails to acknowledge that the Programmatic Agreement has been executed and is contained in Exhibit S, Attachment S-5 and does not mention First Foods. Further, Section 3.3 states that CTUIR First Foods are not relevant to the EFSC siting standard. CTUIR First Foods are resources the tribe has legally protected interests in that can and will be materially affected by the construction of this line. This Exhibit clearly delineates the fact that the APA failed to address First Foods and that this continued failure to acknowledge and address First Foods is a critical flaw in the APA.

Cultural Resources:

Through the site certificate process, ODOE is asking about the sufficiency of the information provided for achieving the EFSC Historic, Cultural, and Archaeological Resources standard (OAR 345-022-0090). From our perspective, it is not. A detailed list of specific comments on Exhibit S is attached. Generally, the insufficiency can be summarized as two main points. First, even discounting the poor consultation that has taken place through the BLM, IPC has failed to include us in the review of many documents that are attached to Exhibit S but which have never come out through the 106 process to consulting parties. Thus, we are unable to determine whether the numbers of sites and eligibility are correct. That means that we cannot “find that that construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impacts to” historic, cultural, or archaeological resources eligible for inclusion in the National Register of Historic Places. We don’t think the information in Exhibit S puts EFSC into a position to make such a finding either.

The second general insufficiency is how the Exhibit addresses historic properties of religious and cultural significance to Indian tribes. These are “historic, cultural or archaeological resources.” The document discusses two or three (depending on the section of the report) such properties that are in the SHPO database. They assert that they requested additional data and were denied such data when we in fact provided them detailed information. They do not mention that the CTUIR and likely other tribes have worked with the BLM on other areas of religious and cultural significance. IPC should have worked with tribes to write a section on HPRCSITs. This would have shown that they take this site type seriously and reflected that the Section 106 process for those site types is still in its infancy.

The project order, Section III(s) states, “The application shall include evidence of consultation with affected tribes regarding archaeological and cultural sites and materials that may be found on the proposed facility site.” From our perspective, the application provides no such evidence. The CTUIR also feels that IPC has made little to no effort to meet this requirement. The fact that we have not received several documents developed for this application is further evidence of the insufficiency of their consultation.

Below is taken from our objection to the FEIS.

The CTUIR recommended avoidance of Glass Hill in the DEIS due to a combination of natural and cultural resource concerns the CTUIR raised over the years in our discussions regarding the B2H line. Glass Hill is currently undeveloped and crosses multiple fisheries habitat restoration

efforts planned and implemented between the CTUIR and the owner of the Elk Song Ranch as well as the former 516 Ranch along Rock Creek and Graves Creek. To place an entirely new energy corridor across an area lacking any corridors fragments critical winter and summer elk range. The CTUIR recommended selection of the proposed alternative in the DEIS relative to Glass Hill because it was adjacent to an existing impact, the 230kV power line, which would introduce fewer new impacts to the landscape. An enormous National Register of Historic Places eligible archaeological site and site significant to the CTUIR dating to the Pleistocene/Holocene transition will also be adversely affected by the Glass Hill alternative. Additionally, rather than avoiding impacts to elk, the EIS acknowledges that the Glass Hill alternative would impact elk winter range.

Idaho Power's efforts to address this project's impacts on cultural resources have been problematic since the outset. They proposed to conduct a 15% random sample of all alternatives. The sample conducted was not random and did not include the myriad alternatives added after the DEIS, including elements of the route eventually selected as the preferred route. Portions of the Visual Assessment of Historic Properties were not completed as proposed. Consideration of effects to historic properties has been poorly explained and incomplete. Due to a failure to provide the background information it has been impossible for the CTUIR to determine whether sites have been omitted from consideration or considered as not significant when in fact they are eligible for inclusion in the National Register of Historic Places (National Register). Many of the various contracting companies working on cultural resources for this project lack familiarity with the history and prehistory of the region, as has been clear from their discussion of sites and context provided. Based on these failures and limitations, it is clear that the Council does not have adequate or equal levels of information regarding the alternatives. It is not possible for them to understand how the different alternatives will impact cultural resources. Any decision made does not taken into account those impacts.

The model employed to analyze the impacts of route options does not take into account existing impacts relative to previous development/disturbance. Without such consideration, it is impossible to understand how this project impacts sites listed in and eligible for inclusion in the National Register. Several route options were chosen in absence of consideration of pre-existing developments, such as Glass Hill discussed above. The failure to include preexisting impacts resulted in equating the impacts of a new line on Glass Hill to co-locating the line with the existing 230kV line in the analysis of the EIS, see page 3-1533.

The project proponent has a predisposition to elevate historic resources, especially the Oregon Trail, over prehistoric resources. This bias has been present throughout the cultural resource process for this project.

Specific Comments:

See attached specific comments spreadsheet.

Boardman to Hemingway Transmission Line Comments on the Amended Preliminary Application for Site Certificate From the Confederated Tribes of the Umatilla Indian Reservation			
Exhibit	Section No.	Pg./Para./Sentence Reference (as needed)	Comment
B	Attachment B-2, Appendix A, Page A-2	No line numbers	This summary inadequately documents the concerns of the CTUIR. The summary focuses exclusively on prioritization of line siting without addressing any other issues or concerns raised by the CTUIR in our letter to BLM scoping for the B2H project. For the record, we have attached our scoping comments provided to BLM and those comments provided to Oregon EFSC.
BB	3.3	BB-7, Lines 31-35.	The Amended Preliminary Application repeatedly states that the line does not cross the reservation and concludes therefore that no tribal resources need to be addressed beyond existing exhibits. This fails to mention that the visual, noise and cultural impacts occur on reservation as well as fails to understand that tribal rights to resources off reservation can and will be impacted by the project. Treaty reserved rights and resources do not exclusively occur on reservation lands.
BB	3.3	BB-8, Lines 16-18.	The Amended Preliminary Application states "Project impacts on the First Foods are, however, fully addressed under the Section 106 of the National Historic Preservation Act compliance process that will be memorialized in a Programmatic Agreement for the Project." This is patently false, nowhere in the Programmatic Agreement does it address first foods. The PA is only about complying with Section 106 of the NHPA. The PA is contained in Exhibit S, Attachment S-5. Even a cursory review would confirm First Foods are not addressed.
S	S1	Footnote 1	"The SHPO is yet to concur with findings of field surveys." Without SHPO concurrence, we really have no idea what sites are and are not eligible. Nor have other consulting parties been involved.
	S3	34-36	"The application shall include evidence of consultation with affected tribes regarding archaeological and cultural sites and materials that may be found on the proposed facility site." As you'll note in comments below, especially the lack of providing us with the confidential attachments to Exhibit S, from our perspective this requirement has not been met.
	S9	32-34	"Although compliance with Section 106 of the NHPA does not equate to compliance with EFSC standards, studies conducted in support of Section 106 compliance are utilized to support compliance with EFSC standards." We just want to make sure that EFSC understands that some documents submitted as part of Exhibit S have been developed through the 106 mandated consultation process (even though we remain highly disappointed at the ability of the BLM to address our comments; at least we have seen the documents), but some have not. They are required as part of the 106 process but have not been submitted to consulting parties to review.
	S11	20, 21, 25, and 27	The existence of these documents (High Probability Areas Assessment, Enhanced Archaeological Survey, ILS, HPMP), or revised documents, is news to us.
	S12	17	Based on other uses of the word "aboveground" in this document, this does not include properties of religious and cultural significance to the CTUIR. Visual impacts can affect the integrity of setting, feeling, and association for these types of properties. The treatment of this type of property is spotty and confusing throughout the document. We prefer the term "historic properties of religious and cultural significance to Indian tribes" (HPRCSIT), as recommended by the ACHP. They eventually use the term TCP, which is not necessary since no such non-tribal properties were located. It is unclear to what degree such properties were inventoried.

	S12	30-31	"Resources that are addressed by these studies can be categorized as archaeological or aboveground resources." This is not consistent with ODOE's language regarding cultural resources. Other types of resources may be eligible for the National Register. This is overly simplistic and does not adequately address the types of impacts to archaeological sites that may have values other than just archaeology. It is unclear which of these two categories HPRCSITs would fall into.
	S14-15	42-1	The CTUIR never saw an updated literature review for the alternatives suddenly added to the FEIS, after the DEIS.
	S15	6 through 9	We objected to several aspects of this plan, especially the validity of the non-random 15% sample. No evidence of its adequacy was provided. IPC and the federal agencies simply said "that's what's been done on other projects." A true random sample is critical, as is an understanding of what percentage sample is needed to provide an adequate sample to answer the research questions (which here are likely presence/absence of archaeological sites). Also, an adequate sample of each alternative is critical if one is trying to determine whether one alternative is better or worse for archaeological resources. From the CTUIR's perspective, this was simply an exercise, and seemingly was never intended to gather data sufficient to actually influence a decision on which route to use. This may not pertain to the EFSC process, but it let's you know that the process for choosing a route did not seriously consider cultural resources.
	S15	11 through 12	Based on the definition of Site Boundary, we have not been provided the information referred to.
	S15	37-38	If existing roads need to be improved in any way, they should be surveyed.
	S15	47	We do not agree that lawns have been "extensively disturbed." It should be noted that archaeological sites and cemeteries have been found under paved roads, highways, and parking lots. If any such will be disturbed, there must be an assessment of subsurface materials.
	S16	1	Please note that in the Columbia Plateau, talus slopes were often used for burials. How is IPC taking this into account? Were bedrock exposures examined for rock images and features?
	S16	4 through 37	There needs to be some indication that IPC understands that archaeological sites exist within a larger context and may in fact be properties of religious and cultural significance to tribes. How does that fit in here?
	S16	29	There has been no discussion of the definition of a high probability area with the CTUIR. Seems like the kind of thing we would be consulted about.
	S16	26	Please define this "acceptable" visibility. Is the assumption that there has been no natural deposition that could obscure a 10,000 year old site?
	S16	33-34	Given the number of isolated finds just east of Bombing Range Road, as well as the recorded HPRCSITs, we're surprised no high probability areas were found along the West of Bombing Range Road alternatives.
	S17	22	"Unlikely" is not a category of evaluation. For the purposes of the NHPA, a site is either eligible or not eligible. Only the consulting parties can determine whether or not it is actually eligible. The CTUIR's comments on the VAHP and RLS were not adequately addressed. The RLS did not adhere to the VAHP. We did not receive a 2017 version of the ILS.
	S17	22	From our perspective, and based on the documents we were provided, only Criterion C was adequately considered. Research was not carried out to determine if important people were associated with the properties. Assessment of association with important events or patterns of our history was also lacking.
	S18	16	How many invited signatories/concurring parties signed? As written, the implication is the CTUIR might sign. The CTUIR has not signed and has no intention of doing so because our comments have not been adequately addressed.

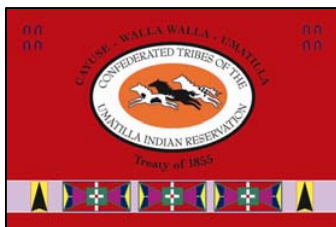
S18	23	I don't believe that is why it's a phased approach. The phased approach was more because of alternative considerations required under the NEPA process and the lack of desire to do the work for all of the alternatives. That's how we got to the poorly considered 15% sample.
S18	31	The existence of an ODOE specific HPMP is news to the CTUIR. We are unaware of approaches to effect determinations.
S19	6	How are HPRCSITs addressed in this document? Where do I look to understand impacts and mitigation of those impacts to those sites?
S35	9 through 11	In order to be true to the intent of the law, we think this section needs to include what comes between "Archaeological Object" and "Archaeological Site." That's "Site of Archaeological Significance, ORS 358.905(1)(b). This term shows the importance of consultation with tribes to the state of Oregon. Since we've never seen forms or information about the new sites identified during this survey, we have not had an opportunity to give our opinion about their significance in writing.
S35	30	Please note that this is the only HPRCSITs that have been identified to the SHPO. Additional properties and areas of concern were provided to the lead federal agency for this undertaking. This document does not seem to address them at all.
S36	8	"No information pertaining to the two TCPs could be obtained from CTUIR or BLM and therefore could not be fully addressed by the field survey." This is false. We provided information on September 27, 2016 to Kirk Ranzetta of AECOM on which criteria they were eligible under, the physical characteristics that make them eligible, character defining features, viewshed information, the criteria of adverse effect, and information regarding micrositing. On September 27 Mr. Ranzetta answered, "Thank you Catherine for the thorough responses. They were very helpful. I may have some follow up questions to clarify a few points.." No follow up questions were forthcoming. It is our understanding that Mr. Ranzetta was working on the ILS.
S36	9 through 10	As noted above, if the existing roads will need to be modified, additional work should take place.
S36	13	Will the areas of these "potential resources" be subsurface tested?
S37	Table S5, last two rows	How is it that the "TCPs" identified in Table S-2 aren't included in this table? None of the other HPRCSITs are either, but I'd expect at least those two to be in the Bombing Range Road alternatives.
S38	Table S6, last two rows	This table is also missing the "TCPs".
S39	7 through 8	As noted above, statements that no information was provided regarding the HPRCSITs, how the project will impact them, and why they are eligible are simply untrue.
S39	21	"NRHP-eligibility determinations of resources and acceptance of archaeological resources identified thus far are pending review and concurrence by SHPO." For the 106 process, tribes are to be consulted regarding properties' eligibility. Such a review is not pending with the CTUIR as we have not been provided that information.
S39	23	"Final impact analyses will follow completion of the enhanced archaeological survey, NRHP-eligibility and archaeological site boundary testing, and SHPO concurrence with findings." What about other consulting parties? This document overly focuses on SHPO's roll, ignoring other parties.
S39	33	What did the NPS recommended for this project?
S39	40-43	"For those unevaluated sites that cannot be avoided by Project activities, a resource-specific evaluation or testing plan consistent with the HPMP will be developed after completion of the archaeological survey (including inaccessible areas and subsurface testing) to determine the NRHP eligibility of the sites." This can't happen until after completion of the HPMP.

	S47	1 through 4	This is a great recommendation. However, given the proposed route and alternatives, and the size of the properties, I do not believe it's possible. Even if by some engineering feat a tower was not built in the footprint of the site, the wires between the towers would be within the site and the towers would in all likelihood also be visible. This statement seems to suggest to EFSC that these sites won't be impacted. The CTUIR does not agree.
	S49	5 through 6	"86 sites have been recommended as not eligible for listing in the NRHP..." The CTUIR needs more information to determine whether or not we agree with these recommendations.
	S49	16-17	"All NRHP eligibility recommendations are considered preliminary and require the concurrence of the SHPO." Any role for tribes? It's hard to tell if tribes think a property is significant if no one asks them.
	S49	25	It's important to remember that avoiding the footprint does not necessarily avoid impacts to the characteristics of the site that make it significant.
	S49	26-27	"If avoidance is infeasible, it is recommended that data recovery, additional research, and/or consultation with local Native American tribes be conducted." A better way to describe this process is to say a mitigation plan will be developed with consulting parties. Presumably the yet to be written HPMP would describe such a process. This sentence unreasonably limits mitigation measures.
	S49	33	Usually treatment is a term associated with the resolution of adverse effects, not with evaluation.
	S49	33-34	As noted, the ODOE-specific HPMP was not developed in consultation with tribes.
	S50	Table S10	The CTUIR received this report late and have not had a through chance to review the sites that make up this table, we are unable to determine if we agree with these numbers.
	S50		The RLS of the indirect APE consists of 5 miles or to the visual horizon on either side of the centerline of the Proposed Route and alternatives. The section lists the number of resources identified within the indirect APE. Some tribal data has been included but that data are solely based on the file and literature review. The VAHP states that "A RLS is designed to be a 'first look' at a broad group of historic resources and records basic information. Fieldwork for the RLS will be conducted by teams of two field crew members, who will drive publicly accessible rights-of-way and record resources in a systematic manner." The RLS and ILS fieldwork has not occurred for the indirect APE on tribal lands and this document does not state this. The RLS and ILS data need to gathered and taken into account. It should be acknowledged that the numbers of sites in this document may not be final as the fieldwork as not been conducted.
	S50	5	It would be better to define the term "aboveground" earlier, when it is used the first time.
	S50	5 through 7	The definition of aboveground leads me to believe it doesn't include HPRCSITs.
	S54	9	Archaeological sites may require integrity of feeling, setting, and association even if they don't have aboveground features. How did IPC take that into account?
	S54	18-19	"because the Project is so distant that any change to the setting will be extremely minor." At maximum, it will be 5 miles away. Transmission line towers are quite visible at that distance.
	S54	33	"22 resources retain no aboveground features." That doesn't mean there can't be an impact to the site, depending on what characteristics make it significant.
	S54	36-40	We haven't seen the document this is based on, so can't tell if we agree. We had many comments on a draft of the RLS that were not addressed.

	S55	5	We're not sure of the value of separating direct and indirect effects. They are both adverse effects. It seems possible that people can infer that an indirect effect is less important than a direct effect when that is neither true nor the intent of the NHPA.
	S62	26	We do not understand how having and IDP mitigates an adverse effect. It's a protocol for what to do when a site or burial is found during construction. The last draft of this document we received was in 2015.
	S63	Table S17	One column is Type of Impact. Another is Duration of Impact. Some permanent impacts are permanent, some permanent impacts' duration is the life of the project. We do not understand.
	S63	Table S17	The bottom two rows are about unidentified sites that will be identified after the issuance of the site certificate, but before construction begins. They are unidentified now, but they won't be when ground disturbance happens. Therefore, we don't understand why they are being treated differently than sites that are known now.
	S64	Table S17	The top row on this page has the same problem as the previous two rows.
	S64	28	Refers to "three identified TCPs"; EFSC should know that the CRPP has identified many more.
	S65	Table S18	"IPC, in coordination with BLM, will continue to consult with the Oregon SHPO regarding the TCPs within the Site Boundary and indirect analysis area to determine the nature of the resources and appropriate mitigation." It is inconceivable that there is no role for tribes in this process.
	S65	14	"Impacts on the two TCPs identified by the Class I literature MAY be direct and/or indirect." Please change that to "will be direct and/or indirect." Also, it is unclear why sometimes two HPRCSITs are discussed and sometimes three sites are discussed. The effects will also apply to all the other HPRCSITs that IPC is not discussing at all, but that tribes have identified during this process.
	S66	2	"If avoidance is not possible..." Rather than trying to design the project around such impacts, a route was selected that goes right through several and affects others as well. Avoidance was rejected before this project reached EFSC.
	S66	5 through 7	In all likelihood, offsite mitigation will be required for these and other properties, as we have told IPC repeatedly. Public education for non-tribal members is not a high priority in the face of destruction of elements of our culture. When something is taken from the culture, something else needs to be given back.
	S66	17-19	Regarding "measures for avoidance", as noted above, the time for preventing destruction of resources was during the identification of the route. Input on how to route the line to minimize and avoid impacts was disregarded. Now big picture avoidance is off the table, except for eliminating a few terrible alternatives, such as the Morgan Lake alternative, that will have more significant impacts on resources.
	S66	22	One does not mitigate sites. One mitigates effects to sites.
	S66	25-26	NHPA says to avoid, minimize, or mitigate effects. Thus, avoidance is not mitigation.
	S66	35	Please insure the training includes state regulations that protect archaeological resources and burials.
	S66	45	As noted, the CTUIR does not have an up to date IDP. The BLM told us they were putting it on "hold" in November 2015. The contents of this document are very important to us and we expect to develop it in consultation with the various parties.
	S67	12	Sturdy fencing may be required to protect areas. We have seen many instances of flagging or loose plastic fencing being insufficient to keep a large piece of equipment out of a site area.
	S67	14	Monitors are likely to be appropriate for all or some of this project, not just in areas with known sites.

	S68	Table S19	First row indicates surveys were completed between 2011 and 2014. Some portions of this route were not under consideration at that time. Please explain.
	S68	Table S19	Third row, middle column states, "Evaluation may include site testing and Native American consultations." Please clarify that evaluation WILL include Native American consultations.
	S69	Table S19	First row, please note that no analysis of impacts to properties of religious and historic places has started.
	S70	10 through 25	Please ensure the HPMP is developed in meaningful consultation with affected tribes. Thus far, there have been many meetings about this project, but not much meaningful consultation.
	S70	31	Please add the following to the sentence: "consistent with the HPMP, which was developed in consultation with consulting parties."
	S70	42	This may be the appropriate place to require the presence of a cultural resource monitor during construction.
	S71	4	Please add something to the effect, "Within one year after construction is completed, the site certificate holder shall provide evidence of the completion of all mitigation as detailed in site-specific HPMPs or the HPMP as a whole."
	S71	32-38	This section asserts that this project, taking into account mitigation, will not result in significant adverse impacts to cultural resources. What if significant adverse effects cannot be mitigated? What if no agreement on such mitigation can be reached between parties? What does that mean for the site certificate? It would mean that the conclusion of this Exhibit is false. Are there certificate conditions that could address such a concern?
	81	Attachment S-1	If ODOE would like details of the comments the CTUIR made on this plan and the lack of addressing of those comments, please let us know.
	131	Attachment S-4	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	132	Attachment S-5	If ODOE would like details of the comments the CTUIR made on the PA and the lack of addressing of those comments, please let us know.
	225	Attachment S-6	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	226	Attachment S-7	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	504	Attachment S-8	IPC did not provide the CTUIR this document in 2016. This is the first we've seen of it. The PA requires development of the HPMP with consulting parties.
	564	Attachment S-10	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.

Confederated Tribes *of the*
Umatilla Indian Reservation
Department of Natural Resources
Administration



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Pendleton, OR 97801

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Phone 541-276-3165 Fax: 541-276-3095

September 27, 2010

Bureau of Land Management
B2H Project
Post Office Box 655
Vale, Oregon 97918

Submitted electronically to: comment@boardmantohemingway.com

Dear Bureau of Land Management:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Department of Natural Resources (DNR) has reviewed the July 27, 2010 *Federal Register* article "Revised Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Boardman to Hemingway 500kV Transmission Line (B2H) Project in Idaho and Oregon and Possible Land Use Plan Amendments." Because the proposed Boardman to Hemingway line has the potential to significantly and adversely impact treaty reserved resources, the CTUIR DNR offers the following suggestions for consideration during the National Environmental Policy Act (NEPA) process. The comments contained in this letter are not an exclusive list of the CTUIR's concerns regarding this project and we anticipate consulting with the BLM and Forest Service (FS) over the duration of this project to fully evaluate the impacts of this project.

The proposed B2H route has already been identified. The CTUIR DNR obtained information regarding this route from Idaho Power's *Notice of Intent to Apply for a Site Certificate for the Boardman to Hemingway Transmission Line*, which describes the process followed to determine a route. Included in this process is the identification of Selected Key Constraints and their Permitting Importance (see Table D-2). The CTUIR DNR does not know whether the federal agencies were included in the identification of the constraints or in their permitting importance, but we are confident that the CTUIR was not consulted on their determination. We recommend that alternative routes be considered in the NEPA process so that government to government consultation includes a meaningful discussion of the location of the proposed transmission line rather than simply consultation on whether or not it should be permitted. For example, in developing the proposed route, Idaho Power determined that avoiding crossing federal land was a low priority. The availability of federally owned and managed land is essential to the exercise of treaty rights reserved by the CTUIR, and if the proposed line prevents the use of a substantial amount of federal land for traditional, treaty-protected activities, the impact to the CTUIR will be significant. Avoiding the Oregon National Historic Trail Interpretive Center was a high priority, but constructing within 500 feet of a cemetery had an avoidance level of moderate. Similarly, avoiding big game winter range was considered a moderate priority. The avoidance of impacts to such areas is a high priority to the CTUIR. There must be an opportunity for the CTUIR and the federal government to work together on our priorities involving the meaningful opportunity to relocate the line when priorities conflict.

CTUIR DNR Letter to BLM

Re: Boardman to Hemmingway 500kV powerline

September 27, 2010

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The BLM and Forest Service have identified ten preliminary issues, with which we agree. The CTUIR DNR requests that impacts to both treaty-reserved resources and cultural resources be added to that list. The CTUIR DNR is concerned about impacts this proposed project will have on First Food resources. The First Foods (water, salmon, deer, cous, and huckleberry) are ritualistically served at the Longhouse, the center of the CTUIR community culture. The serving ritual represents a closely-held, ecologically and culturally informed view of the landscape upon which the CTUIR depends. Each First Food represents a grouping of similar species, with salmon representing a variety of aquatic life forms (e.g. steelhead, lamprey, freshwater mussels, and various resident fish), deer (big game), cous (plant bulbs), and the huckleberry representing fruiting plants. DNR's mission is to ensure that the First Foods are protected, restored, and enhanced for the perpetual cultural and economic benefit of the CTUIR. Essentially, the DNR seeks to ensure that, at a minimum, the First Foods will be present at every community meal, with a long-term goal of restoring species within each food grouping to provide a serving table rich in native species.

In entering into the Treaty of 1855, the CTUIR ceded to the United States 6.3 million acres, but reserved the perpetual right to hunt, gather and graze livestock on all unclaimed lands within its aboriginal territory. Each of the First Foods, and the right to harvest them, are explicitly protected in the Treaty of 1855. As portions of the CTUIR's aboriginal homeland passed into private ownership, the CTUIR's access to these resources diminished. Therefore, it is crucial for the Tribes to cooperatively manage the remaining federal land to maximize the health of the First Foods. A healthy culture is not possible without a healthy ecosystem providing the First Foods. As tribal members can hunt, gather and graze livestock on unclaimed lands, it is important that there be sufficient habitat on federal lands and that habitat be protected from development. The impacts to the treaty-reserved resources from power line construction, operation and maintenance must be analyzed, such as the impact of high-voltage lines on the wintering habitats of big game and whether construction access will open previously closed areas to resource damage by the public.

There should be an analysis of the viewshed impacts of the line, particularly through the Blue Mountains immediately south of the Umatilla Indian Reservation. There are currently no power lines through this area, and the CTUIR believes that placement of a 500kV line through this area will have a significant negative effect on the viewshed. Further, the proposed route would cross the original Umatilla Indian Reservation as established by the Treaty of 1855. The CTUIR has established a policy to purchase back lands which were part of the original reservation to bring these lands back into trust for the tribe and therefore has a significant interest in analysis of the long term impacts of the proposed route.

The centerline of the proposed route crosses a portion of the Umatilla Indian Reservation, as it passes through parcel 6300 in Township 1 South, Range 35 East, WM at approximately milepost 93. This land is owned by and under the jurisdiction of the CTUIR, but is not indicated as tribally-owned land on the maps Idaho Power has provided. None of the agreements regarding cultural resource work have included the CTUIR's Tribal Historic Preservation Officer (THPO).


CTUIR DNR Letter to BLM
Re: Boardman to Hemmingway 500kV powerline
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Please initiate consultation with the THPO regarding the undertaking's area of potential effects as soon as possible.

The CTUIR DNR expects to remain informed and involved throughout the NEPA process with the BLM and the FS. Please feel free to contact me or Audie Huber, DNR Intergovernmental Affairs Manager at 541-276-3165 with any questions regarding these comments. We can be reached at 541-276-3165.

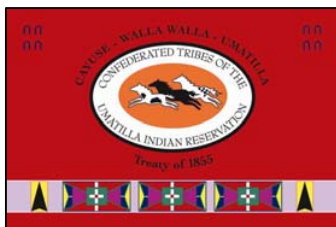
Respectfully,



 Eric J. Quaempts, Director
Department of Natural Resources

cc: Ted Davis, BLM
Donald N. Gonzalez, BLM
Steve Ellis, USFS
Kevin Martin, USFS
CTUIR: CRC, Bruce Zimmerman, Audie Huber

Confederated Tribes *of the*
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September 27, 2010

Sue Oliver
Energy Facility Siting Officer
Oregon Department of Energy
395 East Highland Avenue
Hermiston, Oregon 97838

Submitted electronically to: Sue.Oliver@state.or.us

Dear Ms. Oliver:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) Department of Natural Resources (DNR) has reviewed Idaho Power's *Notice of Intent to Apply for a Site Certificate for the Boardman to Hemingway Transmission Line* (Notice of Intent). The Oregon Department of Energy has asked the CTUIR to provide comments on specific issues as a reviewing agency. This letter addresses those issues, but also outlines several additional concerns of the CTUIR. These comments are offered based on our government to government relationship with the State of Oregon and we hope to work with the Oregon Energy Facility Siting Council (EFSC) in consultation throughout the facility siting process.

Responses to Comments Requested by the Oregon Department of Energy:

a. Contact person assigned to coordinate DNR's comments on the NOI:

Eric Quaempts, Director
Department of Natural Resources
46411 Timine Way
Pendleton, Oregon 97801
(541) 276-3447

b. Comments on aspects of the facility that are within DNR's particular responsibility or area of expertise.

The CTUIR DNR is concerned about the impacts this proposed project will have on First Food resources. The First Foods (water, salmon, deer, cous, and huckleberry) are ritualistically served at the Longhouse, the center of the CTUIR community culture. The serving ritual represents an intimate, ecologically and culturally informed view of the landscape upon which the CTUIR depends. Each First Food represents a grouping of similar species, with salmon representing a variety of aquatic life forms (e.g. steelhead, lamprey, freshwater mussels, and various resident fish), deer (big game), cous (plant bulbs), and the huckleberry representing fruiting plants. The CTUIR DNR's mission is to ensure that the First Foods are protected, restored, and enhanced for the perpetual cultural and economic benefit of the CTUIR. Essentially, the CTUIR DNR seeks to ensure that, at a minimum, the First Foods will be present at every community meal, with a long-

CTUIR DNR Oregon Energy Facility Siting Council
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term goal of restoring species within each food grouping to provide a serving table rich in native species.

In entering into the Treaty of 1855, the CTUIR ceded to the United States 6.3 million acres, but reserved the perpetual right to hunt, gather and graze livestock on all unclaimed lands within its aboriginal territory. Each of the First Foods, and the right to harvest them, are explicitly protected in the Treaty of 1855. As portions of the CTUIR's aboriginal homeland passed into private ownership, the CTUIR's access to these resources diminished. Therefore, it is crucial for the Tribes to cooperatively manage the remaining federal land to maximize the health of the First Foods. A healthy culture is not possible without a healthy ecosystem providing the First Foods. As tribal members can hunt, gather and graze livestock on unclaimed lands, it is important that there be sufficient habitat on federal lands and that habitat be protected from development. The impacts to the treaty-reserved resources from power line construction, operation and maintenance must be analyzed, such as the impact of high-voltage lines on the wintering habitats of big game and whether construction access will open previously closed areas to resource damage by the public.

The CTUIR DNR is concerned about this project's potential to cause habitat fragmentation, disruption of wildlife migration habits, and connectivity. In addition, we are concerned about the introduction of weed species from habitat disturbance and the construction of many miles of new roads. We would like information on the long-term plan to manage weed impacts. We would also like to know what will be planted in forested areas from which all trees will be removed, how such areas will be managed and whether herbicides will be used.

Permitting this project is an undertaking within the meaning of the National Historic Preservation Act and the CTUIR DNR believes this undertaking is likely to adversely affect historic properties, including those of religious and cultural significance to the CTUIR. Known resources likely to be impacted include the Oregon Trail, tribal trails, named places, villages, camps, traditional hunting, fishing, medicine, gathering, and digging areas, as well as archaeological sites.

c. Recommendations regarding the size and location of analysis areas

As noted in the cover letter to the NOI, it is a preliminary document so it is premature to define analysis areas for various resources. The CTUIR DNR, however, looks forward to working with Idaho Power and BLM/FS on the study design for resources protected by treaty and statute. See our comments below on the phased approach for additional comments regarding analysis areas for viewshed impacts.

d. List of necessary studies

A traditional use study should be conducted in consultation with affected tribes to identify historic properties of religious and cultural significance. Additionally, studies analyzing the proposed project's impacts on big game and other wildlife species will be necessary. Unless existing data document how wildlife respond to transmission lines, such studies need to be conducted before the

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potential wildlife impacts of this line can be understood. Wildlife impact studies should identify the corridors through which wildlife travel in the area of the transmission line and analyze the implications of the line on habitat fragmentation and connectivity. Page B-7 of the Notice of Intent indicates, "In accordance with Idaho Power's Avian Protection Plan, avian-safe design will be implemented as practical and feasible to reduce risk of bird collision and electrocution in high avian risk areas." Are there plans to identify high avian risk areas? Also, we would like to ensure that studies of migratory bat corridors be undertaken. Bats have historically been under analyzed and as such many impacts permitted without the necessary information.

e. Relative merits of the preferred and alternate transmission line corridors

Idaho Power identifies constraints to constructing the line and provides avoidance priorities for each. However, there is no explanation of how these avoidance priorities for specific categories, such as public lands and cemeteries were determined. Without that information, it is difficult to determine whether or not we agree with Idaho Power's findings.

The CTUIR DNR strongly questions the alternative in Malheur County designed to avoid irrigated farmland near the Snake River. That alternative lengthens the transmission line by diverting onto BLM land, which will disproportionately impact treaty-reserved resources.

The centerline of the proposed route crosses the Umatilla Indian Reservation, across parcel 6300 in Township 1 South, Range 35 East, WM, at approximately milepost 93. This land is owned and under the jurisdiction of the CTUIR, held in trust by the Bureau of Indian Affairs for the CTUIR. If the state issues a site certificate, the CTUIR DNR expects that these lands will be specifically excluded from the certificate.

f. List of statutes, administrative rules and local government ordinances administered by the CTUIR that might apply to construction or operation of the proposed facility and a description of any information needed for determining compliance.

First and foremost, the Treaty of 1855 between the CTUIR and the United States must be considered in establishing the line. The CTUIR secured perpetual rights under the Treaty that are linked to much of the lands affected by this project. Among other rights secured by the Treaty, the CTUIR retains the rights to hunt, fish, gather, and graze livestock on lands that will be affected by the proposed line. The reservation of these rights includes a corresponding right to the resources associated with those rights (i.e. fish, big game, traditional plants, etc.). In analyzing the impacts of the line EFSC must consider the potential impacts to these treaty-reserved rights and resources.

Additionally, there are a number of federal and state laws addressing cultural resources which must be considered as part of this process, including but not limited to:

- The Native American Graves Protection and Repatriation Act, 25 USC 3000 et seq, for portions of the line on federal and Indian lands.

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- The Archaeological Resources Protection Act, 16 USC 470aa et seq, for portions on federal and Indian lands.
- The National Historic Preservation Act, 16 USC 470 et seq, for the area of potential effect.
- Oregon Indian Graves and Protected Objects law, ORS 97.740 et seq, for the portions not on federal or Indian lands.
- Oregon Archaeological Objects and Sites, ORS 358.905 et seq, for portions not on federal or Indian lands.

g. List of Permits:

In the event the line crosses the Umatilla Indian Reservation, Idaho Power will need permission from the CTUIR Board of Trustees, the Bureau of Indian Affairs and the Tribal Planning Office which administers our Land Development Code. There may be more permits depending upon the resources impacted, but that will need to be addressed with the appropriate zoning/regulatory authority.

h. Road building standards applicable within jurisdiction.

Similar to above, section (g), road standard construction on reservation would be determined by the Tribal Planning Office.

i. Comments on the phased study approach.

The CTUIR DNR does not understand how the phased approach will work with the NEPA process. The draft environmental impact statement (DEIS) will be prepared based on input from Phase 1. But the purpose of the DEIS is to identify the alternatives' impacts so that a decision can be made determining which is the best alternative. For many resources, the only activities during Phase 1 are reviewing existing data. For some categories of potential impacts, there may be no existing data regarding the specific proposed area or its alternatives. Similarly, it seems that the Oregon Department of Energy will not have enough information to determine whether the proposed project meets your requirements.

Appendix J-1 of the Notice of Intent provides more detail on the phased approach. The Noise Analysis Area is insufficient. Rather than identifying noise sensitive areas about which it knows, Idaho Power should create a map of the entire proposed line and alternative routes indicating where different levels of noise will be audible, from the loudest to no audible sound. The studies of historic properties of religious and cultural significance to Indian tribes will likely identify noise sensitive areas. A noise level map would streamline the process whereby affected tribes determine the level of auditory impact to these sites.

Similarly, maps showing the areas from which the project will be visible should be developed. Rather than using arbitrary distances, the map should extend to where the project will no longer be visible, whether because of topography or distance. It is also not appropriate to judge when an object on the horizon is and is not intrusive; different people and different cultures will have

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differing ideas about intrusiveness. The visual analysis needs to be sure to include consideration not just of the towers, but of any lights that will be associated with the structures. In addition, within forested areas, large swaths of trees will be removed. These areas will likely be visible from longer distances than the towers themselves. Of particular note, there should be an analysis of the viewshed impacts of the line through the Blue Mountains immediately south of the Umatilla Indian Reservation. This area is relatively pristine, with no existing power lines. The CTUIR DNR believes placement of a 500kV line through this area will have a significant, negative effect on the viewshed. Further, this area is part of the original Umatilla Indian Reservation established by the Treaty of 1855. The CTUIR has established a policy to purchase back lands which were on the original reservation to bring these lands back into trust for the tribe. The CTUIR therefore has a significant interest in analysis of the long term impacts of the location of the line here.

Idaho Power limits its cumulative impacts analysis to “projects that have applied for a permit from local, state, or federal authorities and which are publicly known.” The DNR does not believe this is an adequate interpretation of the phrase “reasonably foreseeable.” Wind projects have historically developed in close proximity to existing transmission lines. The two things that wind proponents look for are wind and an ability to transmit the power it could generate. Idaho Power must look at wind resources along the proposed route and address developments that this proposed line, simply by its presence, will allow to be developed. The BLM has several wind evaluation projects which are pre-permit but post analysis at the conceptual level. The fact that these projects will become viable once transmission becomes available should be considered in whether they are “reasonably foreseeable.” In addition, EFSC will need to consider cumulative impacts to the Oregon Trail and other historic properties which have been crossed by previous transmission lines, roads, and pipelines.

The phased approach to cultural resource analysis does not include an analysis area. Clarification of what area will be analyzed for cultural resource impacts needs to be developed. The phased approach also refers to established key observation points. What are these points and how will they be used? A survey of only 15% of the proposed transmission line is not acceptable. Under Phase 2 of the Phased Study Plan, it says “Listed Sites or Sites Eligible for Listing on the National Register of Historic Places,” But no information is included about what analysis will be undertaken regarding such places. The CTUIR DNR suggests that in Phase 1, all cultural resources are identified through literature review, on the ground study, and traditional use studies. In Phase 2, these cultural resources should be evaluated to determine whether they are eligible for inclusion in the National Register of Historic Places. A plan to avoid, minimize, or mitigate effects to historic properties will be developed, to inform the agencies in their decision on which alternative to select in the NEPA process and on whether issuing a site certificate is consistent with their regulations. In Phase 3, the avoidance, minimization, and mitigation measures will be implemented.

The analysis of Social and Economic Resources focuses on counties. Please ensure that the Umatilla Indian Reservation, as a sovereign governmental unit, is included in consideration of the proposed project’s impacts. It will be necessary to look at data beyond the census to determine how tribal members utilize the area to be impacted; without that information, it will not be clear whether there are trust resource issues and environmental justice issues.

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j. List of tribal codes that the tribe recommends to the Council for review:

In the event the line crosses the Umatilla Indian Reservation, applicable tribal laws would be the Land Development Code, Tribal Employment Rights Office Code, Taxation Code, Water Code, Environmental Health Code as well as other regulatory rulemakings depending upon the activity. Copies of these codes are available on-line.¹ Other regulatory requirements may be in place depending upon the exact nature of the activity associated with siting, construction as well as operations and maintenance.

k. Errors in the Document


Exhibit E addresses the permits necessary for the proposed project. Both the BLM and the Forest Service issue permits for cultural resource work on the lands they manage. The exhibit indicates that those permits are issued pursuant to the National Historic Preservation Act. In the case of both agencies, the permits are issued under the Archaeological Resources Protection Act.

Table J-1 indicates the gray wolf was removed from the list of Endangered Species in Eastern Oregon and Idaho. That information is out of date; the gray wolf has been returned to the Endangered Species list throughout the Northern Rocky Mountain Region.

Conclusion

The CTUIR appreciates EFSC's invitation to provide comments on Idaho Power's Notice of Intent as a reviewing agency. The CTUIR fully expects to remain informed and involved throughout the siting process. Please feel free to contact me or Audie Huber, DNR Intergovernmental Affairs Manager at 541-276-3165 with any questions regarding these comments.

Respectfully,


Eric J. Quaempts, Director
Department of Natural Resources

cc: Ted Davis, BLM
Donald N. Gonzalez, BLM
Steve Ellis, USFS
Kevin Martin, USFS
CTUIR: CRC, Bruce Zimmerman, Audie Huber

¹ <http://www.umatilla.nsn.us/laws.html>

Boardman to Hemingway Transmission Line Comments on the Amended Preliminary Application for Site Certificate From the Confederated Tribes of the Umatilla Indian Reservation			
Exhibit	Section No.	Pg./Para./Sentence Reference (as needed)	Comment
B	Attachment B-2, Appendix A, Page A-2	No line numbers	This summary inadequately documents the concerns of the CTUIR. The summary focuses exclusively on prioritization of line siting without addressing any other issues or concerns raised by the CTUIR in our letter to BLM scoping for the B2H project. For the record, we have attached our scoping comments provided to BLM and those comments provided to Oregon EFSC.
BB	3.3	BB-7, Lines 31-35.	The Amended Preliminary Application repeatedly states that the line does not cross the reservation and concludes therefore that no tribal resources need to be addressed beyond existing exhibits. This fails to mention that the visual, noise and cultural impacts occur on reservation as well as fails to understand that tribal rights to resources off reservation can and will be impacted by the project. Treaty reserved rights and resources do not exclusively occur on reservation lands.
BB	3.3	BB-8, Lines 16-18.	The Amended Preliminary Application states "Project impacts on the First Foods are, however, fully addressed under the Section 106 of the National Historic Preservation Act compliance process that will be memorialized in a Programmatic Agreement for the Project." This is patently false, nowhere in the Programmatic Agreement does it address first foods. The PA is only about complying with Section 106 of the NHPA. The PA is contained in Exhibit S, Attachment S-5. Even a cursory review would confirm First Foods are not addressed.
S	S1	Footnote 1	"The SHPO is yet to concur with findings of field surveys." Without SHPO concurrence, we really have no idea what sites are and are not eligible. Nor have other consulting parties been involved.
	S3	34-36	"The application shall include evidence of consultation with affected tribes regarding archaeological and cultural sites and materials that may be found on the proposed facility site." As you'll note in comments below, especially the lack of providing us with the confidential attachments to Exhibit S, from our perspective this requirement has not been met.
	S9	32-34	"Although compliance with Section 106 of the NHPA does not equate to compliance with EFSC standards, studies conducted in support of Section 106 compliance are utilized to support compliance with EFSC standards." We just want to make sure that EFSC understands that some documents submitted as part of Exhibit S have been developed through the 106 mandated consultation process (even though we remain highly disappointed at the ability of the BLM to address our comments; at least we have seen the documents), but some have not. They are required as part of the 106 process but have not been submitted to consulting parties to review.
	S11	20, 21, 25, and 27	The existence of these documents (High Probability Areas Assessment, Enhanced Archaeological Survey, ILS, HPMP), or revised documents, is news to us.
	S12	17	Based on other uses of the word "aboveground" in this document, this does not include properties of religious and cultural significance to the CTUIR. Visual impacts can affect the integrity of setting, feeling, and association for these types of properties. The treatment of this type of property is spotty and confusing throughout the document. We prefer the term "historic properties of religious and cultural significance to Indian tribes" (HPRCSIT), as recommended by the ACHP. They eventually use the term TCP, which is not necessary since no such non-tribal properties were located. It is unclear to what degree such properties were inventoried.

S12	30-31	"Resources that are addressed by these studies can be categorized as archaeological or aboveground resources." This is not consistent with ODOE's language regarding cultural resources. Other types of resources may be eligible for the National Register. This is overly simplistic and does not adequately address the types of impacts to archaeological sites that may have values other than just archaeology. It is unclear which of these two categories HPRCSITs would fall into.
S14-15	42-1	The CTUIR never saw an updated literature review for the alternatives suddenly added to the FEIS, after the DEIS.
S15	6 through 9	We objected to several aspects of this plan, especially the validity of the non-random 15% sample. No evidence of its adequacy was provided. IPC and the federal agencies simply said "that's what's been done on other projects." A true random sample is critical, as is an understanding of what percentage sample is needed to provide an adequate sample to answer the research questions (which here are likely presence/absence of archaeological sites). Also, an adequate sample of each alternative is critical if one is trying to determine whether one alternative is better or worse for archaeological resources. From the CTUIR's perspective, this was simply an exercise, and seemingly was never intended to gather data sufficient to actually influence a decision on which route to use. This may not pertain to the EFSC process, but it let's you know that the process for choosing a route did not seriously consider cultural resources.
S15	11 through 12	Based on the definition of Site Boundary, we have not been provided the information referred to.
S15	37-38	If existing roads need to be improved in any way, they should be surveyed.
S15	47	We do not agree that lawns have been "extensively disturbed." It should be noted that archaeological sites and cemeteries have been found under paved roads, highways, and parking lots. If any such will be disturbed, there must be an assessment of subsurface materials.
S16	1	Please note that in the Columbia Plateau, talus slopes were often used for burials. How is IPC taking this into account? Were bedrock exposures examined for rock images and features?
S16	4 through 37	There needs to be some indication that IPC understands that archaeological sites exist within a larger context and may in fact be properties of religious and cultural significance to tribes. How does that fit in here?
S16	29	There has been no discussion of the definition of a high probability area with the CTUIR. Seems like the kind of thing we would be consulted about.
S16	26	Please define this "acceptable" visibility. Is the assumption that there has been no natural deposition that could obscure a 10,000 year old site?
S16	33-34	Given the number of isolated finds just east of Bombing Range Road, as well as the recorded HPRCSITs, we're surprised no high probability areas were found along the West of Bombing Range Road alternatives.
S17	22	"Unlikely" is not a category of evaluation. For the purposes of the NHPA, a site is either eligible or not eligible. Only the consulting parties can determine whether or not it is actually eligible. The CTUIR's comments on the VAHP and RLS were not adequately addressed. The RLS did not adhere to the VAHP. We did not receive a 2017 version of the ILS.
S17	22	From our perspective, and based on the documents we were provided, only Criterion C was adequately considered. Research was not carried out to determine if important people were associated with the properties. Assessment of association with important events or patterns of our history was also lacking.
S18	16	How many invited signatories/concurring parties signed? As written, the implication is the CTUIR might sign. The CTUIR has not signed and has no intention of doing so because our comments have not been adequately addressed.

S18	23	I don't believe that is why it's a phased approach. The phased approach was more because of alternative considerations required under the NEPA process and the lack of desire to do the work for all of the alternatives. That's how we got to the poorly considered 15% sample.
S18	31	The existence of an ODOE specific HPMP is news to the CTUIR. We are unaware of approaches to effect determinations.
S19	6	How are HPRCSITs addressed in this document? Where do I look to understand impacts and mitigation of those impacts to those sites?
S35	9 through 11	In order to be true to the intent of the law, we think this section needs to include what comes between "Archaeological Object" and "Archaeological Site." That's "Site of Archaeological Significance, ORS 358.905(1)(b). This term shows the importance of consultation with tribes to the state of Oregon. Since we've never seen forms or information about the new sites identified during this survey, we have not had an opportunity to give our opinion about their significance in writing.
S35	30	Please note that this is the only HPRCSITs that have been identified to the SHPO. Additional properties and areas of concern were provided to the lead federal agency for this undertaking. This document does not seem to address them at all.
S36	8	"No information pertaining to the two TCPs could be obtained from CTUIR or BLM and therefore could not be fully addressed by the field survey." This is false. We provided information on September 27, 2016 to Kirk Ranzetta of AECOM on which criteria they were eligible under, the physical characteristics that make them eligible, character defining features, viewshed information, the criteria of adverse effect, and information regarding micrositing. On September 27 Mr. Ranzetta answered, "Thank you Catherine for the thorough responses. They were very helpful. I may have some follow up questions to clarify a few points.." No follow up questions were forthcoming. It is our understanding that Mr. Ranzetta was working on the ILS.
S36	9 through 10	As noted above, if the existing roads will need to be modified, additional work should take place.
S36	13	Will the areas of these "potential resources" be subsurface tested?
S37	Table S5, last two rows	How is it that the "TCPs" identified in Table S-2 aren't included in this table? None of the other HPRCSITs are either, but I'd expect at least those two to be in the Bombing Range Road alternatives.
S38	Table S6, last two rows	This table is also missing the "TCPs".
S39	7 through 8	As noted above, statements that no information was provided regarding the HPRCSITs, how the project will impact them, and why they are eligible are simply untrue.
S39	21	"NRHP-eligibility determinations of resources and acceptance of archaeological resources identified thus far are pending review and concurrence by SHPO." For the 106 process, tribes are to be consulted regarding properties' eligibility. Such a review is not pending with the CTUIR as we have not been provided that information.
S39	23	"Final impact analyses will follow completion of the enhanced archaeological survey, NRHP-eligibility and archaeological site boundary testing, and SHPO concurrence with findings." What about other consulting parties? This document overly focuses on SHPO's roll, ignoring other parties.
S39	33	What did the NPS recommended for this project?
S39	40-43	"For those unevaluated sites that cannot be avoided by Project activities, a resource-specific evaluation or testing plan consistent with the HPMP will be developed after completion of the archaeological survey (including inaccessible areas and subsurface testing) to determine the NRHP eligibility of the sites." This can't happen until after completion of the HPMP.

S47	1 through 4	This is a great recommendation. However, given the proposed route and alternatives, and the size of the properties, I do not believe it's possible. Even if by some engineering feat a tower was not built in the footprint of the site, the wires between the towers would be within the site and the towers would in all likelihood also be visible. This statement seems to suggest to EFSC that these sites won't be impacted. The CTUIR does not agree.
S49	5 through 6	"86 sites have been recommended as not eligible for listing in the NRHP..." The CTUIR needs more information to determine whether or not we agree with these recommendations.
S49	16-17	"All NRHP eligibility recommendations are considered preliminary and require the concurrence of the SHPO." Any role for tribes? It's hard to tell if tribes think a property is significant if no one asks them.
S49	25	It's important to remember that avoiding the footprint does not necessarily avoid impacts to the characteristics of the site that make it significant.
S49	26-27	"If avoidance is infeasible, it is recommended that data recovery, additional research, and/or consultation with local Native American tribes be conducted." A better way to describe this process is to say a mitigation plan will be developed with consulting parties. Presumably the yet to be written HPMP would describe such a process. This sentence unreasonably limits mitigation measures.
S49	33	Usually treatment is a term associated with the resolution of adverse effects, not with evaluation.
S49	33-34	As noted, the ODOE-specific HPMP was not developed in consultation with tribes.
S50	Table S10	The CTUIR received this report late and have not had a through chance to review the sites that make up this table, we are unable to determine if we agree with these numbers.
S50		The RLS of the indirect APE consists of 5 miles or to the visual horizon on either side of the centerline of the Proposed Route and alternatives. The section lists the number of resources identified within the indirect APE. Some tribal data has been included but that data are solely based on the file and literature review. The VAHP states that "A RLS is designed to be a 'first look' at a broad group of historic resources and records basic information. Fieldwork for the RLS will be conducted by teams of two field crew members, who will drive publicly accessible rights-of-way and record resources in a systematic manner." The RLS and ILS fieldwork has not occurred for the indirect APE on tribal lands and this document does not state this. The RLS and ILS data need to be gathered and taken into account. It should be acknowledged that the numbers of sites in this document may not be final as the fieldwork has not been conducted.
S50	5	It would be better to define the term "aboveground" earlier, when it is used the first time.
S50	5 through 7	The definition of aboveground leads me to believe it doesn't include HPRCSITs.
S54	9	Archaeological sites may require integrity of feeling, setting, and association even if they don't have aboveground features. How did IPC take that into account?
S54	18-19	"because the Project is so distant that any change to the setting will be extremely minor." At maximum, it will be 5 miles away. Transmission line towers are quite visible at that distance.
S54	33	"22 resources retain no aboveground features." That doesn't mean there can't be an impact to the site, depending on what characteristics make it significant.
S54	36-40	We haven't seen the document this is based on, so can't tell if we agree. We had many comments on a draft of the RLS that were not addressed.

	S55	5	We're not sure of the value of separating direct and indirect effects. They are both adverse effects. It seems possible that people can infer that an indirect effect is less important than a direct effect when that is neither true nor the intent of the NHPA.
	S62	26	We do not understand how having and IDP mitigates an adverse effect. It's a protocol for what to do when a site or burial is found during construction. The last draft of this document we received was in 2015.
	S63	Table S17	One column is Type of Impact. Another is Duration of Impact. Some permanent impacts are permanent, some permanent impacts' duration is the life of the project. We do not understand.
	S63	Table S17	The bottom two rows are about unidentified sites that will be identified after the issuance of the site certificate, but before construction begins. They are unidentified now, but they won't be when ground disturbance happens. Therefore, we don't understand why they are being treated differently than sites that are known now.
	S64	Table S17	The top row on this page has the same problem as the previous two rows.
	S64	28	Refers to "three identified TCPs"; EFSC should know that the CRPP has identified many more.
	S65	Table S18	"IPC, in coordination with BLM, will continue to consult with the Oregon SHPO regarding the TCPs within the Site Boundary and indirect analysis area to determine the nature of the resources and appropriate mitigation." It is inconceivable that there is no role for tribes in this process.
	S65	14	"Impacts on the two TCPs identified by the Class I literature MAY be direct and/or indirect." Please change that to "will be direct and/or indirect." Also, it is unclear why sometimes two HPRCSITs are discussed and sometimes three sites are discussed. The effects will also apply to all the other HPRCSITs that IPC is not discussing at all, but that tribes have identified during this process.
	S66	2	"If avoidance is not possible..." Rather than trying to design the project around such impacts, a route was selected that goes right through several and affects others as well. Avoidance was rejected before this project reached EFSC.
	S66	5 through 7	In all likelihood, offsite mitigation will be required for these and other properties, as we have told IPC repeatedly. Public education for non-tribal members is not a high priority in the face of destruction of elements of our culture. When something is taken from the culture, something else needs to be given back.
	S66	17-19	Regarding "measures for avoidance", as noted above, the time for preventing destruction of resources was during the identification of the route. Input on how to route the line to minimize and avoid impacts was disregarded. Now big picture avoidance is off the table, except for eliminating a few terrible alternatives, such as the Morgan Lake alternative, that will have more significant impacts on resources.
	S66	22	One does not mitigate sites. One mitigates effects to sites.
	S66	25-26	NHPA says to avoid, minimize, or mitigate effects. Thus, avoidance is not mitigation.
	S66	35	Please insure the training includes state regulations that protect archaeological resources and burials.
	S66	45	As noted, the CTUIR does not have an up to date IDP. The BLM told us they were putting it on "hold" in November 2015. The contents of this document are very important to us and we expect to develop it in consultation with the various parties.
	S67	12	Sturdy fencing may be required to protect areas. We have seen many instances of flagging or loose plastic fencing being insufficient to keep a large piece of equipment out of a site area.
	S67	14	Monitors are likely to be appropriate for all or some of this project, not just in areas with known sites.

	S68	Table S19	First row indicates surveys were completed between 2011 and 2014. Some portions of this route were not under consideration at that time. Please explain.
	S68	Table S19	Third row, middle column states, "Evaluation may include site testing and Native American consultations." Please clarify that evaluation WILL include Native American consultations.
	S69	Table S19	First row, please note that no analysis of impacts to properties of religious and historic places has started.
	S70	10 through 25	this project, but not much meaningful consultation. Also, perhaps a site certificate condition is the place to address the incomplete consideration of HPRCSITs.
	S70	31	Please add the following to the sentence: "consistent with the HPMP, which was developed in consultation with consulting parties."
	S70	42	This may be the appropriate place to require the presence of a cultural resource monitor during construction.
	S71	4	Please add something to the effect, "Within one year after construction is completed, the site certificate holder shall provide evidence of the completion of all mitigation as detailed in site-specific HPMPs or the HPMP as a whole."
	S71	32-38	This section asserts that this project, taking into account mitigation, will not result in significant adverse impacts to cultural resources. What if significant adverse effects cannot be mitigated? What if no agreement on such mitigation can be reached between parties? What does that mean for the site certificate? It would mean that the conclusion of this Exhibit is false. Are there certificate conditions that could address such a concern?
	81	Attachment S-1	If ODOE would like details of the comments the CTUIR made on this plan and the lack of addressing of those comments, please let us know.
	131	Attachment S-4	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	132	Attachment S-5	If ODOE would like details of the comments the CTUIR made on the PA and the lack of addressing of those comments, please let us know.
	225	Attachment S-6	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	226	Attachment S-7	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.
	504	Attachment S-8	IPC did not provide the CTUIR this document in 2016. This is the first we've seen of it. The PA requires development of the HPMP with consulting parties.
	564	Attachment S-10	The CTUIR did not initially receive this document and asked for it on August 25 which was not enough time to review prior to these comments being submitted; CTUIR would like an extension to review this document.

**B2HAPDoc13 ASC Reviewing Agency Comment DSL_Wetland Concurrence
Letter Only WD2017-0229 Brown 2018-09-13**



Oregon

Kate Brown, Governor

Department of State Lands

775 Summer Street NE, Suite 100

Salem, OR 97301-1279

(503) 986-5200

FAX (503) 378-4844

www.oregon.gov/dsl

State Land Board

Kate Brown

Governor

September 13, 2018

Idaho Power Company
Attn: Zach Funkhouser
1221 W. Idaho St.
Boise, ID 83702

Re: WD # 2017-0229 Wetland Delineation Report for Boardman to
Hemingway Transmission Line Project (B2H); Morrow, Umatilla,
Union, Baker and Malheur Counties

Dennis Richardson
Secretary of State

Tobias Read
State Treasurer

Dear Mr. Funkhouser:

The Department of State Lands has reviewed the wetland delineation report prepared by Tetra Tech Inc. for the site referenced above. Please note that the numerous study areas include only a portion of the tax lots (see the attached maps Appendix A-2). Based upon the information presented in the report, and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in Figures Appendix A-5 of the report. Please replace all copies of the preliminary wetland map with these final Department-approved maps. The final maps can be accessed from the agency's [Dropbox](#) site under the WD # 2017-0229 folder for the next 30 days.

Within the study areas, 45 wetlands, 54 waterways, 51 ephemeral waterways and 5 ponds were identified (Appendix B-1 through B-14). The wetlands, waterways and ponds are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetlands or below the ordinary high-water line (OHWL) of the waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined). However, East and West Birch Creek and Rock Creek are essential salmonid streams; therefore, fill or removal of any amount of material within the OHWL and hydrologically-connected wetlands may require a state permit. The 51 ephemeral waterways are not regulated per OAR 141-085-0515(3); therefore, are not subject to current state Removal-Fill requirements.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will determine jurisdiction for purposes of the Clean Water Act.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon

request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5218 if you have any questions.

Sincerely,



Lauren Brown
Jurisdiction Coordinator

Approved by



Peter Ryan, PWS
Aquatic Resource Specialist

Enclosures

ec: Ed Strohmaier, Tetra Tech Inc.
Kellen Tardaewether, ODOE
Morrow, Umatilla, Union, Baker and Malheur Planning Departments
Melanie O'Meara, Corps of Engineers
Joy Vaughan, ODFW
Dan Cary, DSL

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279**. A single PDF attachment of the completed cover form and report may be e-mailed to **Wetland_Delineation@dsl.state.or.us**. For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

<input checked="checked" type="checkbox"/> Applicant <input type="checkbox"/> Owner Name, Firm and Address: Zach Funkhouser, Permitting Idaho Power Company 1221 W. Idaho Street Boise, ID 83702	Business phone # (208) 388-5375 Mobile phone # (optional) E-mail: zfunkhouser@idahopower.com
--	--

<input checked="checked" type="checkbox"/> Authorized Legal Agent, Name and Address: Zach Funkhouser, Permitting Idaho Power Company 1221 W. Idaho Street Boise, ID 83702	Business phone # (208) 388-5375 Mobile phone # E-mail: zfunkhouser@idahopower.com
---	---

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.
 Typed/Printed Name: **Zach Funkhouser** Signature:
 Date: _____ Special instructions regarding site access: _____

Project and Site Information (using decimal degree format for lat/long., enter centroid of site or start & end points of linear project)

Project Name: Boardman to Hemingway Transmission Line Project	Latitude: Start, 45.846764 End, 43.549194	Longitude: Start, -119.616633 End, -117.026997
Proposed Use: New 500-kilovolt transmission line and associated facilities.	Tax Map # See Appendix A-2	
Project Street Address (or other descriptive location): The project crosses five counties from Boardman to near Nyssa.	Township _____ Range _____ Section _____ QQ _____	
	Tax Lot(s) See Table 2-1	
City: NA County: Morrow, Umatilla, Union, Baker, Malheur	Waterway: Multiple, See Appendix A-5 River Mile: NA	
	NWI Quad(s): See Appendix A-3	

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: Tetra Tech, Inc., Attn. Ed Strohmaier 1750 SW Harbor Way, Ste. 400 Portland, OR 97201	Phone # 503-721-7234 Mobile phone # 503-320-6917 E-mail: ed.strohmaier@tetrattech.com
--	--

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.

Consultant Signature: Date: **05/02/2017**

Primary Contact for report review and site access is Consultant Applicant/Owner Authorized Agent

Wetland/Waters Present? Yes No Study Area size: **404 acres** Total Wetland Acreage: **25.04**

Check Box Below if Applicable:

- R-F permit application submitted
- Mitigation bank site
- Wetland restoration/enhancement project (not mitigation)
- Industrial Land Certification Program Site
- Reissuance of a recently expired delineation
- Previous DSL # _____ Expiration date _____

Fees:

- Fee payment submitted
- Fee (\$100) for resubmittal of rejected report
- No fee for request for reissuance of an expired report

Other Information:

Has previous delineation/application been made on parcel? Y N
 If known, previous DSL # _____
 Does LWI, if any, show wetland or waters on parcel?

For Office Use Only

DSL Reviewer: _____	Fee Paid Date: ____ / ____ / ____	DSL WD # _____
Date Delineation Received: ____ / ____ / ____	DSL Project # _____	DSL Site # _____
Scanned: <input type="checkbox"/> Final Scan: <input type="checkbox"/>	DSL WN # _____	DSL App. # _____

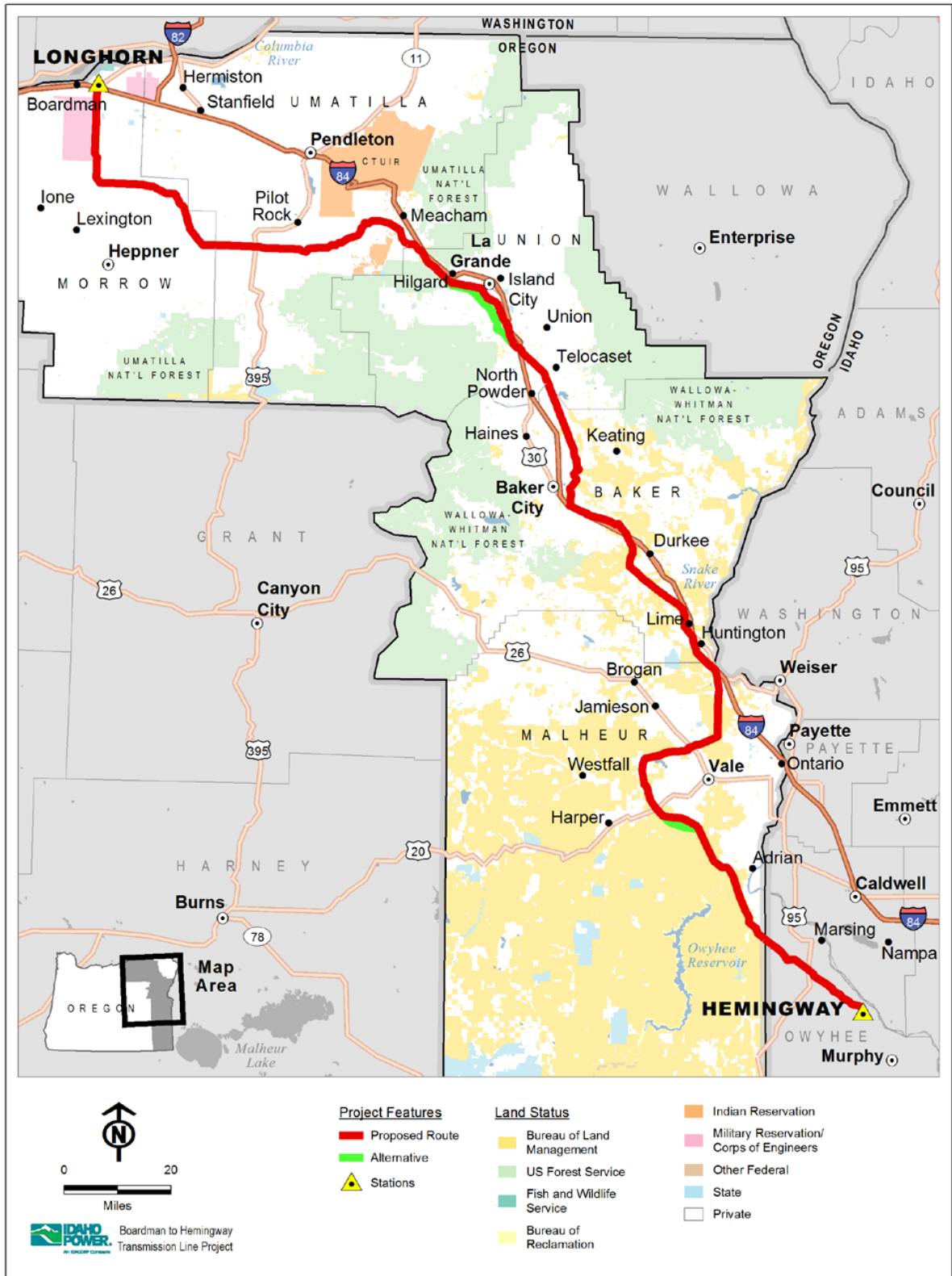


Figure 1. Project Overview Map

B2HAPDoc13-3 ASC Reviewing Agency Comment DSL_Cary 2018-11-02

TARDAEWETHER Kellen * ODOE

From: CARY Dan <dan.cary@state.or.us>
Sent: Friday, November 2, 2018 4:34 PM
To: TARDAEWETHER Kellen * ODOE
Subject: B2H Application Review
Attachments: ApASC_RAI_Exhibit XX_2018 Draft.docx

Kellen,

I have attached DSL's request for additional information (RAI). Idaho Power provided all the items we asked for during the preliminary application review and Idaho Power received a concurred wetland delineation. The new wetland/non-wetland compensatory mitigation plan is well done and meets our requirements. We are only missing the JPA form (included in the preliminary application!)

Dan

Dan Cary, PWS
Aquatic Resource Coordinator Columbia and Clatsop Counties
Aquatic Resource Management Program
Oregon Department of State Lands
775 Summer Street NE, Suite 100
Salem OR 97301-1279
Phone: (503) 986-5302
DSL websites: www.oregon.gov/dsl; <https://lands.dsl.state.or.us/>

Oregon Department of Energy
Request for Additional Information for the ApASC (ApASC RAI) Exhibit XXX – EXHIBIT DSL Comments
November 2, 2018

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
Exhibit J Parts 1, 2, 3			OAR 141-085-0550 (5)	The applicant is required to provide the Joint Permit Application form. It doesn't have to include all the information on the form. It can reference attachments. (Just like what was provided in the Preliminary Application.)	
Exhibit J Parts 1, 2, 3	JPA-Block 12		OAR 141-085-0550(5)(t)	The applicant is required to sign the application	

TARDAEWETHER Kellen * ODOE

From: Stokes, Mark <MStokes@idahopower.com>
Sent: Tuesday, November 13, 2018 8:55 AM
To: CARY Dan
Cc: TARDAEWETHER Kellen * ODOE; English, Aaron
Subject: Boardman to Hemingway Joint Permit Application
Attachments: 2018-11-12 USACOE and ODSL Joint Permit Application.pdf

Dear Mr. Cary,

Please see the attached Joint Permit Application for the Boardman to Hemingway Transmission Line Project. Please contact me if you have any questions concerning the application.

Thank you.

Mark Stokes

ENGINEERING PROJECT LEADER
Idaho Power Company
Work (208) 388-2483 | Cell (208) 863-0043
mstokes@idahopower.com



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Joint Permit Application

This is a joint application, and must be sent to both agencies, who administer separate permit programs. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Date Stamp

	U.S. Army Corps of Engineers Portland District		Oregon Department of State Lands
Corps Action ID Number		DSL Number	

(1) APPLICANT AND LANDOWNER CONTACT INFORMATION			
	Applicant	Property Owner (if different)	Authorized Agent (if applicable) <input type="checkbox"/> Consultant <input type="checkbox"/> Contractor
Contact Name	Dave Wymond	See Appendix A	
Business Name	Idaho Power Company		
Mailing Address 1	1221 W Idaho Street		
Mailing Address 2			
City, State, Zip	Boise, ID 83702		
Business Phone	(208) 388-2742		
Cell Phone			
Fax			
Email			

(2) PROJECT INFORMATION			
A. Provide the project location.			
Project Name Boardman to Hemingway Transmission Line Project	Tax Lot # See Appendix C	Latitude & Longitude* Start: 45.846764, -119.616633 End: 43.549194, -117.026997 See Appendix C	
Project Address / Location See Appendix B	City (nearest) N/A	County Mo, Um, Un, Ba, Ma	
Township See Appendix C	Range See Appendix C	Section See Appendix C	Quarter/Quarter See Appendix C
Brief Directions to the Site See Appendix D for Directions to the Sites.			
B. What types of waterbodies or wetlands are present in your project area? (Check all that apply.)			
<input checked="" type="checkbox"/> River / Stream	<input type="checkbox"/> Non-Tidal Wetland	<input type="checkbox"/> Lake / Reservoir / Pond	
<input type="checkbox"/> Estuary or Tidal Wetland	<input type="checkbox"/> Other	<input type="checkbox"/> Pacific Ocean	
Waterbody or Wetland Name** See Appendix E	River Mile	6 th Field HUC Name	6 th Field HUC (12 digits)
C. Indicate the project category. (Check all that apply.)			
<input type="checkbox"/> Commercial Development	<input type="checkbox"/> Industrial Development	<input type="checkbox"/> Residential Development	
<input type="checkbox"/> Institutional Development	<input type="checkbox"/> Agricultural	<input type="checkbox"/> Recreational	
<input type="checkbox"/> Transportation	<input type="checkbox"/> Restoration	<input type="checkbox"/> Bank Stabilization	
<input type="checkbox"/> Dredging	<input checked="" type="checkbox"/> Utility lines	<input type="checkbox"/> Survey or Sampling	

(2) PROJECT INFORMATION		
<input type="checkbox"/> In- or Over-Water Structure	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Other:

* In decimal format (e.g., 44.9399, -123.0283)

** If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").

(3) PROJECT PURPOSE AND NEED
<p>Provide a statement of the purpose and need for the overall project.</p> <p>See Appendix F for Project Purpose and Need.</p>

(4) DESCRIPTION OF RESOURCES IN PROJECT AREA
<p>A. Describe the existing physical and biological characteristics of each wetland or waterway. Reference the wetland and waters delineation report if one is available. Include the list of items provided in the instructions.</p> <p>See Appendix G, Description of Resources: Wetlands and Waters Characteristics. Table G-1A. Characteristics of Delineated Wetland Resources Proposed for Removal Fill Impacts Table G-2A. Characteristics of Delineated Other Waters Proposed for Removal Fill Impacts Table G-3. Characteristics of Delineated Other Waters (Ephemeral Streams) Proposed for Removal Fill Impacts</p> <p>See Appendix H, State and Federally Listed Species. Table H-1 Federal or State Threatened and Endangered Species Potentially Present within the Project Site Boundary</p>
<p>B. Describe the existing navigation, fishing and recreational use of the waterway or wetland.</p> <p>OAR § 141-085-0565(3)(c) states that the Department of State Lands will issue a permit if it determines the project "would not unreasonably interfere with the paramount policy of this state to preserve the use of its waters for navigation, fishing and public recreation, when the project is on state-owned land."</p> <p>No impacts to wetlands or other waters are currently proposed on state-owned land within the Site Boundary.</p>

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS
<p>Describe project-specific criteria necessary to achieve the project purpose. Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland.</p>

(5) PROJECT SPECIFIC CRITERIA AND ALTERNATIVES ANALYSIS

**See Appendix I, Alternatives Analysis.
Table I-1 Avoidance and Minimization Actions**

(6) PROJECT DESCRIPTION

A. Briefly summarize the overall project including work in areas both in and outside of waters or wetlands.

See Appendix J, Summary of Overall Project Work.

B. Describe work within waters and wetlands.

See Appendix K, Work in Waters and Wetlands.

C. Construction Methods. Describe how the removal and/or fill activities will be accomplished to minimize impacts to waters and wetlands.

(6) PROJECT DESCRIPTION

See Appendix L, Measures to Minimize Impacts.
Table L-1

See Appendix M, Erosion and Sediment Control Plan.

D. Describe source of fill material and disposal locations if known.

See Appendix N, Fill Material and Disposal Locations.

(6) PROJECT DESCRIPTION

E. Construction timeline.

What is the estimated project start date? **2023**

What is the estimated project completion date? **2025**

Is any of the work underway or already complete? Yes No
If yes, describe.

F. Fill Volumes and Dimensions (if more than 4 impact sites, include a summary table as an appendix)

Wetland / Waterbody Name *	Fill Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq.ft. or ac.)	Volume (c.y.)		
See Appendix O	See Appendix K Figures K-239 through K-241			ACRES			See Appendix N
Wetlands	varies	varies	varies	0.211 ac	576	Permanent	"
Wetlands	varies	varies	varies	0.386 ac	TBD	Temporary	"
Other Waters	varies	varies	varies	0.071 ac (0.072 ac for ephemerals)	88 (96 c.y. for ephemerals)	Permanent	"

Other Waters	varies	varies	varies	0.125 ac (0.339 ac for ephemerals)	TBD	Temporary	“
G. Total Fill Volumes and Dimensions							
Fill Impacts to Waters				Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)	
Total Fill to Wetlands				varies	0.597 ac.	576	
Total Fill Below Ordinary High Water				526' Permanent +887' Temporary 1413' Total (1083' Permanent for ephemerals)	0.071ac Perm. 0.125ac Temp. 0.196ac Total (0.09 ac Permanent for ephemerals)	88 Permanent; (119 c.y. Permanent for ephemerals)	
Total Fill Below <u>Highest Measured Tide</u>				N/A	N/A	N/A	
Total Fill Below <u>High Tide Line</u>				N/A	N/A	N/A	
Total Fill Below <u>Mean High Water Tidal Elevation</u>				N/A	N/A	N/A	
H. Removal Volumes and Dimensions (if more than 4 impact sites, include a summary table as an appendix)							
Wetland / Waterbody Name*	Removal Dimensions					Duration of Impact**	Material***
	Length (ft.)	Width (ft.)	Depth (ft.)	Area (sq. ft. or ac.)	Volume (c.y.)		
See Appendix O	See Appendix K Figures K-239 through K-241			ACRES			See Appendix N
Wetlands	varies	varies	varies	0.211 ac	545	Permanent	“
Wetlands	varies	varies	varies	0.386 ac	TBD	Temporary	“
Other Waters	varies	varies	varies	0.071 ac (0.072 ac for ephemerals)	129 (139 c.y. for ephemerals)	Permanent	“
Other Waters	varies	varies	varies	0.125 ac (0.339 ac for ephemerals)	TBD	Temporary	“
I. Total Removal Volumes and Dimensions							
Removal Impacts to Waters				Length (ft.)	Area (sq. ft or ac.)	Volume (c.y.)	
Total Removal to Wetlands				varies	0.597 ac.	545	
Total Removal Below Ordinary High Water				526' Permanent +887' Temporary 1413' Total (1083' Permanent for ephemerals)	0.071ac Perm. 0.125ac Temp. 0.196ac Total (0.09 ac Permanent for ephemerals)	129 c.y. permanent; (139 c.y. Permanent for ephemerals)	
Total Removal Below <u>Highest Measured Tide</u>				N/A	N/A	N/A	
Total Removal Below <u>High Tide Line</u>				N/A	N/A	N/A	
Total Removal Below <u>Mean High Water Tidal Elevation</u>				N/A	N/A	N/A	

* If there is no official name for the wetland or waterway, create a unique name (such as "Wetland 1" or "Tributary A").
 ** Indicate the days, months or years the fill or removal will remain. Enter "permanent" if applicable. For DSL, permanent removal or fill is defined as being in place for 24 months or longer.
 *** Example: soil, gravel, wood, concrete, pilings, rock etc.

(7) ADDITIONAL INFORMATION

Are there any state or federally listed species on the project site? Yes No Unknown

Is the project site within designated or proposed critical habitat? Yes No Unknown

Is the project site within a national Wild and Scenic River? Yes No Unknown

Is the project site within the 100-year floodplain? Yes No Unknown

*** If yes to any of the above, explain in Block 4 and describe measures to minimize adverse effects to these resources in Block 5. See Appendix H regarding critical habitat noted in Block 4, and Appendix P regarding fish passage.**

Is the project site within the Territorial Sea Plan (TSP) Area? Yes No Unknown

*** If yes, attach TSP review as a separate document for DSL.**

Is the project site within a designated Marine Reserve? Yes No Unknown

*** If yes, certain additional DSL restrictions will apply.**

Will the overall project involve construction dewatering or ground disturbance of one acre or more? Yes No Unknown

*** If yes, you may need a 1200-C permit from the Oregon Department of Environmental Quality (DEQ).**

Is the fill or dredged material a carrier of contaminants from on-site or off-site spills? Yes No Unknown

Has the fill or dredged material been physically and/or chemically tested? Yes No Unknown

***If yes, explain in Block 4 and provide references to any physical/chemical testing report(s).**

Has a cultural resource (archaeological) survey been performed on the project area? Yes No Unknown

*** If yes, provide a copy of the survey with this application. Do not describe any resources in this document. See Appendix Q, Cultural and Historic Resources.**

Identify any other federal agency that is funding, authorizing or implementing the project.

Agency Name	Contact Name	Phone Number	Most Recent Date of Contact
US Army Corps of Engineers	Brad Johnson	(503) 808-4383	10-05-2018

List other certificates or approvals/denials required or received from other federal, state or local agencies for work described in this application. For example, certain activities that require a Corps permit also require 401 Water Quality Certification from Oregon DEQ.

Approving Agency	Certificate/ approval / denial description	Date Applied
USACE	CWA Section 404	Application will be made 60 days prior to issuance of the site certificate.

Other DSL and/or Corps Actions Associated with this Site (Check all that apply.)

- Work proposed on or over lands owned by or leased from the Corps
- State owned waterway DSL Waterway Lease #
- Other Corps or DSL Permits Corps # DSL #
- Violation for Unauthorized Activity Corps # DSL #

<input checked="" type="checkbox"/> Wetland and Waters Delineation	Corps #	DSL # WD2012-0050, 0091, -0092, -0197, -0141. WD2017-0229
<input checked="" type="checkbox"/> A wetland / waters delineation has been completed (if so, provide a copy with the application)		
<input checked="" type="checkbox"/> The Corps has approved the wetland / waters delineation within the last 5 years		
<input checked="" type="checkbox"/> DSL has approved the wetland / waters delineation within the last 5 years		

(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION

A. Describe unavoidable environmental impacts that are likely to result from the proposed project. Include permanent, temporary, direct, and indirect impacts.

See Appendix R, Unavoidable Project Impacts

B. For temporary removal or fill or disturbance of vegetation in waterways, wetlands or riparian (i.e., streamside) areas, discuss how the site will be restored after construction.

See Appendix S, Restoration and Rehabilitation of Temporary Impacts.

Compensatory Mitigation

C. Proposed mitigation approach. Check all that apply:

Permittee- <input type="checkbox"/> responsible Onsite Mitigation	Permittee- <input checked="" type="checkbox"/> responsible Offsite mitigation	Mitigation Bank or <input type="checkbox"/> in-lieu fee program	Payment to Provide <input type="checkbox"/> (not approved for use with Corps permits)
---	---	--	---

D. Provide a brief description of mitigation approach and the rationale for choosing that approach. If you believe mitigation should not be required, explain why.

See Appendix T, Compensatory Wetland and Non-Wetland Mitigation Plan.

Mitigation Bank / In-Lieu Fee Information:
 Name of mitigation bank or in-lieu fee project: N/A
 Type of credits to be purchased: N/A

If you are proposing permittee-responsible mitigation, have you prepared a compensatory mitigation plan?
 Yes. Submit the plan with this application and complete the remainder of this section.
 No. A mitigation plan will need to be submitted (for DSL, this plan is required for a complete application).

Mitigation Location Information (Fill out only if permittee-responsible mitigation is proposed)

Mitigation Site Name/Legal Description See Appendix U, Mitigation Location Information	Mitigation Site Address	Tax Lot #
County	City	Latitude & Longitude (in DD.DDDD format)


(8) IMPACTS, RESTORATION/REHABILITATION, COMPENSATORY MITIGATION			
Township	Range	Section	Quarter/Quarter

(9) ADJACENT PROPERTY OWNERS FOR PROJECT AND MITIGATION SITE		
<input type="checkbox"/> Pre-printed mailing labels of adjacent property owners attached	Project Site Adjacent Property Owners	Mitigation Site Adjacent Property Owners

See Appendix V, Names and Addresses of Property Owners

(10) CITY/COUNTY PLANNING DEPARTMENT LAND USE AFFIDAVIT (TO BE COMPLETED BY LOCAL PLANNING OFFICIAL)		
I have reviewed the project described in this application and have determined that: <input type="checkbox"/> This project is not regulated by the comprehensive plan and land use regulations. <input type="checkbox"/> This project is consistent with the comprehensive plan and land use regulations. <input type="checkbox"/> This project will be consistent with the comprehensive plan and land use regulations when the following local approval(s) are obtained: <input type="checkbox"/> Conditional Use Approval <input type="checkbox"/> Development Permit <input type="checkbox"/> Other Permit (see comment section) <input type="checkbox"/> This project is not consistent with the comprehensive plan. Consistency requires: <input type="checkbox"/> Plan Amendment <input type="checkbox"/> Zone Change <input type="checkbox"/> Other Approval or Review (see comment section)		
An application <input type="checkbox"/> has <input type="checkbox"/> has not been filed for local approvals checked above.		
Local planning official name (print)	Title	City / County (circle one)
Signature	Date	
Comments: This Block of the JPA is not applicable to this project.		

(11) COASTAL ZONE CERTIFICATION	
If the proposed activity described in your permit application is within the Oregon coastal zone , the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development (DLCD) for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact DLCD at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.	
CERTIFICATION STATEMENT	
I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.	
Print /Type Name	Title
This Block of the JPA is not applicable to this project.	
Signature	Date

(12) SIGNATURES	
<p><i>Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief, this information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or DSL staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish supplemental information in support of this permit application. I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. I understand that payment of the required state processing fee does not guarantee permit issuance. To be considered complete, the fee must accompany the application to DSL. The fee is not required for submittal of an application to the Corps.</i></p>	
Fee Amount Enclosed	\$
Applicant Signature	
Print Name <i>VERN PORTER</i>	Title <i>VP TRANSMISSION & DISTRIBUTION ENGINEERING & CONSTRUCTION</i>
Signature 	Date <i>11/13/2018</i>
Authorized Agent Signature	
Print Name	Title
Signature	Date
Landowner Signature(s)	
Landowner of the Project Site (if different from applicant)	
Print Name See Appendix W, Signatures.	Title
Signature	Date
Landowner of the Mitigation Site (if different from applicant)	
Print Name See Appendix W, Signatures.	Title
Signature	Date
Department of State Lands, Property Manager (to be completed by DSL)	
<p><i>If the project is located on <u>state-owned submerged and submersible lands</u>, DSL staff will obtain a signature from the Land Management Division of DSL. A signature by DSL for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for a removal-fill permit. A signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied and a separate proprietary authorization may be required.</i></p>	
Print Name	Title
Signature	Date

(13) ATTACHMENTS	
<p><input checked="" type="checkbox"/> Drawings (items in bold are required)</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Location map with roads identified <input checked="" type="checkbox"/> U.S.G.S topographic map <input checked="" type="checkbox"/> Tax lot map <input checked="" type="checkbox"/> Site plan(s) <input checked="" type="checkbox"/> Cross section drawing(s) <input checked="" type="checkbox"/> Recent aerial photo <input type="checkbox"/> Project photos <input checked="" type="checkbox"/> Erosion and Pollution Control Plan(s), if applicable <input type="checkbox"/> DSL/Corps Wetland Concurrence letter and map, if approved and applicable <p><input checked="" type="checkbox"/> Pre-printed labels for adjacent property owners (Required if more than 5)</p> <p><input checked="" type="checkbox"/> Restoration plan or rehabilitation plan for temporary impacts</p> <p><input checked="" type="checkbox"/> Mitigation plan</p> <p><input checked="" type="checkbox"/> Wetland functional assessment and/or stream functional assessment</p> <p><input checked="" type="checkbox"/> Alternatives analysis</p> <p><input type="checkbox"/> Biological assessment (if requested by Corps project manager during pre-application coordination.)</p> <p><input type="checkbox"/> Stormwater management plan (may be required by the Corps or DEQ)</p> <p><input type="checkbox"/> Other:</p> <div style="margin-left: 20px;"> <input type="checkbox"/> <input style="width: 500px; height: 15px;" type="text"/> <input type="checkbox"/> <input style="width: 500px; height: 15px;" type="text"/> </div>	
<p>Send Completed form to:</p> <p>U.S. Army Corps of Engineers ATTN: CENWP-OD-GP PO Box 2946 Portland, OR 97208-2946 Phone: 503-808-4373</p> <p style="text-align: center;">OR</p> <p>U.S. Army Corps of Engineers ATTN: CENWP-OD-GE 211 E. 7th AVE, Suite 105 Eugene, OR 97401-2722 Phone: 541-465-6868</p>	<p>Send Completed form to:</p> <p>DSL - West of the Cascades:</p> <p>Department of State Lands 775 Summer Street NE, Suite 100 Salem, OR 97301-1279 Phone: 503-986-5200</p> <p style="text-align: center;">OR</p> <p>DSL - East of the Cascades:</p> <p>Department of State Lands 1645 NE Forbes Road, Suite 112 Bend, Oregon 97701 Phone: 541-388-6112</p> <p>Send all Fees to: Department of State Lands 775 Summer Street NE, Suite 100 Salem, OR 97301-1279 Pay by Credit Card by Calling 503-986-5253</p>

INSTRUCTIONS FOR PREPARING THE JOINT APPLICATION

This is a joint application, and must be sent to both agencies, who administer separate permit processes. For more complete instructions, contact the Corps and/or DSL or refer to online resources:

- [DSL's Removal-Fill Guide](#); or,
- The Corps' "Permitting 101" video: <http://www.nwp.usace.army.mil/Missions/Regulatory.aspx>

General Instructions and Tips

- Provide the information in the appropriate blocks of the application form. If you need more space, provide a summary in the space provided and attach additional detail as an appendix to the application.
- Not all items on the application form will apply to all projects.
- For most applications, binding and section dividers are not necessary and require additional handling.

The information requested on the form is necessary for the agencies to begin their review. For complex projects or for those that may have more than minimal impacts, additional information may be necessary to complete the evaluation and make a permit decision. Alternative forms of permit applications may be acceptable; contact the Corps and DSL for more information.

Section 1. Applicant and Landowner Contact information

Applicant: The applicant is the responsible party. If the applicant is an agency, business entity or other organization, indicate the name of the organization and a person that has the authority to sign the application.

Authorized Agent: An authorized agent is someone who has permission from the applicant to represent their interests and supply information to the agencies. An agent can be a consultant, an attorney, builder, contractor, or any other person or organization. An authorized agent is optional.

Landowner: Provide landowner information if different from the applicant. The landowner must also sign the application.

Section 2. Project Information

Provide location information. Latitude and longitude can be found by zooming in to your respective project location and reading off the coordinates displayed on the bottom of the map.

Provide information on wetlands and waterways within the project area. Indicate the category of activities that make up your project.

Section 3. Project Purpose and Need

Explain the purpose and need for the project. Also include a brief description of any related activities needed to accomplish the project objectives.

The following items are required by DSL, as applicable:

- If the removal-fill would satisfy a public need and the applicant is a public body, include any pertinent findings regarding public need and benefit.
- If the project involves fill in the estuary for a non-water dependent use, explain how the project is for public use and/or satisfies a public need.
- If the project is located within a [marine reserve or marine protected area](#), explain how the project is needed to study, monitor, evaluate, enforce or protect the designated area.

Section 4. Description of Resources in Project Area

Territorial Sea: For activities in the [Territorial Sea](#) (mean lower low water seaward 3 nautical miles), provide a separate evaluation of the resources and effects determination.

For each wetland, include:

- Whether the wetland is freshwater or tidal, and the [Cowardin class](#) and [Hydrogeomorphic \(HGM\) class](#).
- Source of hydrology and direction of flow (if any).
- Dominant plant species by layer (herb, shrub, tree).
- A functional assessment of the wetland to be impacted (for impacts greater than 0.2 acre, DSL requires use of [ORWAP](#) or [HGM](#)), should be attached as a separate document.
- Identify any vernal pools, bogs, fens, mature forested wetland, seasonal mudflats, or native wet prairies in or near the project area.
- Refer to wetland delineation report if available, and provide copies to agencies (if not previously provided).
- Describe existing uses, including fish and wildlife use (type, abundance, period of use, significance of site).

For rivers, streams, other waterways, lakes and ponds, include a description of, as applicable:

- Streamflow regime (e.g., perennial year-round flow, intermittent seasonal flow, ephemeral event-driven flow). If flow is ephemeral, provide [streamflow assessment](#) data sheet or other information that supports your determination.
- Field indicators used to identify the Ordinary High Water Mark (OHWM).
- Channel and bank conditions.
- Type and condition of riparian (streamside) vegetation.
- Channel morphology (structure and shape).
- Stream substrate.
- Assessment of the functional attributes including hydrologic, geomorphic, biological and chemical and nutrient related functions.
- Fish and wildlife (type, abundance, period of use, significance of site).

Section 5. Alternatives to Avoid and Minimize Impacts to Waters

Provide a brief explanation describing how impacts to waters and wetlands are being avoided and minimized on the project site. For DSL, the alternatives analysis must include:

- Project-specific criteria that are needed to accomplish the stated project purpose.
- A range of alternative sites and designs that were considered with less impact.
- An evaluation of each alternative site and design against the project criteria and a reason for why the alternative was not chosen.
- If the project involves fill in an estuary for a non-water dependent use, a description of Alternative non- estuarine sites must be included.

Section 6. Project Description

Overall Description. Provide a brief description of the overall project, including:

- All associated work with the project both outside and within waters or wetlands.
- Total ground disturbance for all associated work (i.e. area and volume of ground disturbance).
- Total area of impervious surfaces created or modified by the project, if applicable.

Work within Waters and Wetlands. Provide a description of the proposed work within waters and wetlands, including:

- Each removal or fill activity proposed in waters or wetlands, as well as any construction or maintenance of in-water or over-water structures.
- The number and dimensions of in-water or over-water structures (i.e., pilings, floating docks) proposed within waters or wetlands.

Fill Material and Disposal. Provide a description of fill material and procedure for disposal of removed material, including:

- The source(s) of fill materials (if known).
- Locations for disposal area(s) for dredged material, if applicable. If dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into a waterbody. If using an upland disposal area that is not a DEQ-regulated landfill, a [Solid Waste Letter of Authorization](#) or a [Beneficial Use Determination](#) from DEQ may be required.

Construction Methods. Describe how the removal and/or fill activities will be accomplished including the following:

- Construction methods, equipment to be used, access and staging areas, etc.
- Measures you will use during construction to minimize impacts to the waterway or wetland. Examples may include isolating work areas, controlling construction access and using specialized equipment or materials. Attach work area isolation and/or erosion and pollution control plans, if applicable.

Construction Timing. Provide the proposed start and completion date for the project. Describe project work that is already complete, if applicable.

Summary of removal and fill activities. Summarize the dimensions, volume and type/composition of material being placed or removed in each waterbody or wetland. Describe each impact on a separate row. For

instance, if two culverts are being removed from Clear Creek, use two rows. Add extra rows if needed, or include an appendix.

The DSL and the Corps use different elevations for determining whether an activity in tidal waters is regulated by the State's Removal-Fill law, the Clean Water Act, and/or the Rivers and Harbors Act. DSL regulates activities below the highest measured tide. The Clean Water Act applies below the high tide line. The Rivers and Harbors Act applies below the mean high water.

Section 7. Additional Information

Any additional information you provide helps the reviewer(s) understand your project and the other approvals or reviews that may be required.

Section 8. Site Restoration/Rehabilitation and Compensatory Mitigation

Site Restoration/Rehabilitation. For temporary disturbance of soils and/or vegetation in waterways, wetlands or riparian (streamside) areas, discuss how you will restore the site after construction. This may include the following:

- Grading plans to restore pre-existing elevations.
- Planting plans and species list (native species only) to replace vegetation in riparian or wetland areas.
- Maintenance and monitoring plans to document restoration to wetland condition and/or vegetation establishment.
- Associated erosion control for site stabilization.

Compensatory Mitigation. Describe your proposed compensatory mitigation approach, or explain why you believe compensatory mitigation is not required. If proposing permittee-responsible mitigation for permanent impact to wetlands, see OAR 141-085-0705 and 33 CFR 332.4(c) for plan requirements. For permanent impact to waters other than wetlands, see OAR 141-085-0765 and 33 CFR 332.4(c) for plan requirements.

Section 9. Adjacent Property Owners for Impact and Mitigation Site(s)

Names and addresses for properties that are adjacent to the project site and permittee responsible mitigation site (if applicable), are required. "Adjacent" means those properties that share or touch upon a common property line or are across the street or stream. If more than 5, attach pre-printed labels. A list of property owners may be obtained by contacting the county tax assessor's office.

Section 10. City/County Planning Department Land Use Affidavit

This section is required to demonstrate land use compatibility for removal fill permits and water quality certifications. Provide this form to your local planning official for them to complete and sign.

Section 11. Coastal Zone Certification

Your signature for this statement is required for projects within the coastal zone (generally, west of the summit of the Coast Range).

Section 12. Signatures

The application must be signed by the responsible party, landowner and agent, as identified in section 1.

Section 13: Appendixs

Project Drawings. A complete application must include a location map, site plan, cross-section drawings and recent aerial photo. All drawings should be clear, legible and formatted for 8.5 by 11 printing. Use the fewest number of sheets necessary for your drawings or illustrations. While illustrations need not be professionally prepared, they should be clear, accurate, and contain all necessary information, as follows:

Location maps (with subject property identified):

- Location map with roads identified
- U.S.G.S. Topographic map
- Tax lot map (with subject tax lot(s) identified)

Site plan(s), including:

- Entire project site and activity areas
- Existing and proposed contours

- Location of ordinary high water, wetland boundaries or other jurisdictional boundaries (include wetland delineation report if not previously provided)
- Identification of temporary and permanent impact areas within waterways or wetlands
- Map scale or dimensions and north arrow
- Location of staging areas and construction access
- Location of cross section(s), as applicable
- Location of mitigation area, if applicable

Cross section drawing(s), including:

- Existing and proposed elevations
- Identification of temporary and permanent impact areas within waterways or wetlands
- Ordinary high water and/or wetland boundary or other jurisdictional boundaries
- Map scale or dimensions

Recent Aerial photo

- 1:200, or if not available for your site, highest resolution possible

DSL Wetland Concurrence (map and letter)

OCEO Transmission Overview Outline

30 min
+ 15 min QA

2030 RPS and Resource Needs Picture

- West Coast
- Desert Southwest
- Intermountain West

For each of the areas discuss:

- Seasonal & Daily Load/Resource Balance
- Deficiencies
- IRP Plans

Transmission Shift:

- Existing Transmission and Usage
- Transmission included in Regional Transmission Plans (NTTG, West Connect, etc)
- Other Proposed Transmission (TransWest, SWIP North, SunZia, TransCanyon)

Transmission's ability to meet the needs of the areas,

B2H and Gateway – Fit in the future

B2HAPPD0c13-6 ASC Reviewing Agency Comment CTWS_Nauer

TARDAEWETHER Kellen * ODOE

From: Christian Nauer <christian.nauer@ctwsbnr.org>
Sent: Friday, November 16, 2018 12:31 PM
To: TARDAEWETHER Kellen * ODOE
Cc: Robert Brunoe
Subject: Re: Update on B2H EFSC Complete Application for Site Certificate
Attachments: PastedGraphic-1.pdf

Dear Kellen,

Thank you for the opportunity to comment on the B2H EFSC Complete Application for Site Certificate.

General Comment:

As the technical reviewer for NHPA Section 106 and other cultural resource issues for the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO), the CTWSRO Tribal Historic Preservation Office (THPO) has concerns with the potential effects to historic properties or cultural resources within the Project Area of Potential Effects (APE). The Project APE is within the areas of concern for the CTWSRO.

Project-specific Comment(s):

This office is aware of the ongoing discussions and consultations related to historic properties and cultural resources that have been conducted with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and their Cultural Resources Protection Program (CRPP). We have great faith in our neighbors at CTUIR, and defer to them with regard to cultural resource issues associated with B2H.

Please continue to consult with this office and the CTWSRO Tribal Council on future ODOE and EFSC endeavors that will occur within areas of concern for the CTWSRO.

Thank you again for your consideration,

Christian Nauer, MS

Archaeologist
Confederated Tribes of the Warm Springs Reservation of Oregon
Branch of Natural Resources

christian.nauer@ctwsbnr.org

Office 541.553.2026

Cell 541.460.8448

Standard Disclaimers:

*The Confederated Tribes of the Warm Springs Reservation of Oregon have reserved treaty rights in Ceded Lands, as well as Usual and Accustomed and Aboriginal Areas, as set forth through the Treaty with the Middle Tribes of Oregon, June 25, 1855.

*Please know that review by the Tribal Historic Preservation Office does not constitute Government-to-Government consultation. Please ensure that appropriate Government-to-Government consultation is made with the Confederated Tribes of the Warm Springs Tribal Council.

On Oct 22, 2018, at 9:21 AM, Christian Nauer <christian.nauer@ctwsbnr.org> wrote:

Dear Kellen,

Thank you for the Update on B2H EFSC Complete Application for Site Certificate.

As the technical reviewer for NHPA Section 106 and other cultural resource issues for the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO), the CTWSRO Tribal Historic Preservation Office (THPO) has concerns with the potential effects to historic properties or cultural resources within the Project Area of Potential Effects (APE). The Project APE is within the territories and areas of concern for the CTWSRO.

This office would like to request additional information about efforts to identify, evaluate, and protect potential historic properties within the Project APE. If any such efforts have been undertaken, would you please share them with this office?

Thank you again for your consideration

Christian Nauer, MS

Archaeologist
Confederated Tribes of the Warm Springs Reservation of Oregon
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christian.nauer@ctwsbnr.org

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<PastedGraphic-1.pdf>

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On Sep 28, 2018, at 11:57 AM, TARDAEWETHER Kellen * ODOE
<Kellen.Tardaewether@oregon.gov> wrote:

Good morning Christian,

I'm writing to provide an update on the Boardman to Hemingway Transmission Line application for site certificate submitted to the Oregon Department of Energy (ODOE), staff to the Energy Facility Siting Council (EFSC). Under Oregon law, the applicant, Idaho Power Company, must obtain a site certificate from EFSC before constructing and operating the proposed facility. I've bulleted essential dates below for brevity.

- July 19, 2017 - Idaho Power submits amended preliminary application for site certificate
- September 21, 2018 - ODOE determines application for site certificate (ASC) complete
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- October 15-18, 2018 – Public informational meetings on the ASC in each county (see below for more details)
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If you are not the appropriate contact at the Confederated Tribes of Warm Springs to comment on this EFSC facility, please respond and indicate who the appropriate point of contact should be to comment on behalf of the Tribes. Please let me know what questions you have and I look forward to working with you.

Kellen

Public Informational Meetings:

ODOE will hold a series of public informational meetings with the applicant to provide the public and agencies with more information about the proposed facility and the EFSC review process. The informational meetings will include a presentation starting at 5:30 p.m. ODOE and applicant representatives will be available after the presentation to answer specific questions. The informational meetings are *not* public hearings and will not include public testimony or on-the-record public comments. Dual meetings will be held on Thursday the 18th in Umatilla and Morrow counties and will have the same format, presentation and content. We encourage representatives and members of the Confederated Tribes of Warm Springs to attend the meetings☺

County: Malheur

Date: Monday, October 15, 2018

Time: 5:00 pm – 8:00 pm

Location: Four Rivers Cultural Center, 676 SW 5th Ave, Ontario, OR

County: Baker

Date: Tuesday, October 16, 2018

Time: 5:00 pm – 8:00 pm

Location: Community Connections - Baker County Senior Center, 2810 Cedar St, Baker City, OR

County: Union

Date: Wednesday, October 17, 2018

Time: 5:00 pm – 8:00 pm

Location: Blue Mountain Conference Center, 404 12th St, La Grande, OR

County: Umatilla

Date: Thursday, October 18, 2018

Time: 5:00 pm – 8:00 pm

Location: Pendleton Convention Center, 1601 Westgate, Pendleton, OR

County: Morrow

Date: Thursday, October 18, 2018

Time: 5:00 pm – 8:00 pm

Location: Sage Center, 101 Olson Road, Boardman, OR

Kellen Tardaewether

Senior Siting Analyst

Energy Facility Siting Division

Oregon Department of Energy

550 Capitol St N.E., 1st Floor

Salem, OR 97301

P:(503) 373-0214

C: (503) 586-6551

Oregon.gov/energy

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Leading Oregon to a safe, clean, and sustainable energy future.

TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Monday, October 22, 2018 3:02 PM
To: Stokes, Mark; Stanish, David
Cc: English, Aaron
Subject: FW: Update on B2H EFSC Complete Application for Site Certificate
Attachments: PastedGraphic-1.pdf

Hi Mark and David,

Please see the below email from the CTWS. I spoke with Christian at the Tribe and pointed out the locations in Exhibit S and the attachments where he can find information to help answer his questions of “..efforts to identify, evaluate, and protect potential historic properties..” Thanks,

Kellen

Kellen Tardaewether
Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301
P:(503) 373-0214
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From: Christian Nauer [mailto:christian.nauer@ctwsbnr.org]
Sent: Monday, October 22, 2018 9:21 AM
To: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Cc: Robert Brunoe <robert.brunoe@ctwsbnr.org>
Subject: Re: Update on B2H EFSC Complete Application for Site Certificate

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Thank you again for your consideration

Christian Nauer, MS

Archaeologist
Confederated Tribes of the Warm Springs Reservation of Oregon
Branch of Natural Resources

christian.nauer@ctwsbnr.org

Office 541.553.2026

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Kellen Tardaewether

Senior Siting Analyst

Energy Facility Siting Division

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B2HAPPDoc13-11 ASC Reviewing Agency Comment City of La Grande_Strope

TARDAEWETHER Kellen * ODOE

From: Robert Strope <RStrope@cityoflagrande.org>
Sent: Monday, November 26, 2018 4:52 PM
To: TARDAEWETHER Kellen * ODOE
Cc: Michael Boquist; Stu Spence; Kyle Carpenter
Subject: November 26 2018 Letter to DOE B2H City of La Grande
Attachments: November 26 2018 Letter to DOE B2H City of La Grande.docx

Hi Kellen,

Hope you had a wonderful Thanksgiving! Here is our response to the latest version. We opted not to restate everything from past correspondence and focus mostly on a new element. Let me know if you have any questions.

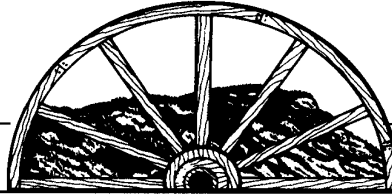
Best Regards,

Robert

Robert A. Strope, MPA
City Manager
City of La Grande
rstrope@cityoflagrande.org
(541) 962-1309
(541) 963-3333 fax

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CITY OF



LA GRANDE

THE HUB OF NORTHEASTERN OREGON

MEMORANDUM

TO: Kellen Tardaewether
Oregon Department of Energy
550 Capitol St. N.E., 1st Floor
Salem, OR 97301

FROM: Robert A. Strobe, City Manager
City of La Grande, Oregon
P.O. Box 670
1000 Adams Avenue
La Grande, OR 97850
(541) 962-1309
rstrobe@cityoflagrande.org

DATE: November 26, 2018

RE: City of La Grande Comments on the Application for Site Certification for the Boardman to Hemingway Transmission Line

General Comments: Thank you for this opportunity to provide comments on the Boardman to Hemingway Transmission Line project submitted by Idaho Power. None of the proposed facilities are located within the City of La Grande's jurisdiction and the most recent version of the proposal is unchanged from the prior submittal. As a result, our comments on this version is limited.

From the original application, Map #52 has been removed from the report, which included the staging area at the Union County Airport. This was the only element that was located within the City of La Grande's jurisdiction. With the removal of this facility, none of the remaining facilities are subject to City of La Grande land use regulations.

Within the proposed application, the most significant element that concerns the City of La Grande is on map #51 (Exhibit C) which shows a proposed access road for the Proposed Route (see orange line in illustration below). This access road is labeled as a "substantial modification 21%-70% improvements." This access road is an extension of Hawthorn Drive, which is a steep gravel road that currently serves only a couple single-family dwellings and does not conform to City development standards. The road is located within an area subject to geological hazard issues, which could make the proposed improvements challenging and may result in adverse impacts to City of La Grande residential properties in the vicinity. Also, Hawthorn Drive is

accessed via Sunset Drive which is near capacity and may not support the additional traffic impacts caused during this development. The applicant's report is not clear about the traffic volumes or impacts that may occur on these roads. Based on this, the City of La Grande would ask that Idaho Power be required to provide detailed information regarding this proposed access.



The La Grande City Council renews our objection to the Proposed Route in the preliminary application and again strongly requests that Idaho Power remove the Proposed Route from their application and instead use the Morgan Lake Alternative or ideally reconsider the BLM preferred route. As we stated previously, of the two routes identified in the application, the applicant selected the one most impactful to the City of La Grande as their Proposed Route. In their response Idaho Power states they intend to construct on the route that has the most support from the local community. The local community does not support the B2H project as evidenced by the overwhelming adverse public response each time the topic is on an agenda. Therefore Idaho Power is unlikely to get community support for any route as it will be perceived as support for the project. Perhaps another way to put it, the La Grande City Council, which represents over the more than 13,000 residents who are in closest proximity to B2H, has stated they object more to the Proposed Route than the Morgan Lake Alternative. This should be more than sufficient for Idaho Power to remove the Proposed Route from their application.

The City of La Grande has met with Idaho Power to discuss mitigation and is optimistic that Idaho Power will address view shed and other concerns raised in our previous correspondence. It would be beneficial for our previously requested mitigation to be included as conditions of approval.

B2HAPPD0c13-17 ASC Reviewing Agency Comment Baker County_Kerns 2018-12-14

TARDAEWETHER Kellen * ODOE

From: hkerns@bakercounty.org
Sent: Friday, December 14, 2018 3:53 PM
To: TARDAEWETHER Kellen * ODOE; Cornett, Todd
Cc: mbennett@bakercounty.org; bharvey@bakercounty.org; bnichols@bakercounty.org; hmartin@bakercounty.org; david.petersen@tonkon.com
Subject: Baker County Agency Report for B2H Application for Site Certificate
Attachments: Agency Report on ASC.pdf

Kellen,

Attached, please find Baker County's agency report on the ASC. Thank you for all of your help with this, I appreciate it so much. Please let me know if you have any questions.

Holly Kerns
Director, Baker City & County Planning Department
Office: 541.523.8219
Fax: 541.523.5925
1995 Third Street, Suite 131
Baker City, OR 97814

Please be aware - Documents such as emails, letters, maps, reports, etc. sent from or received by the Baker City-County Planning Department are subject to Oregon Public Records law and are NOT CONFIDENTIAL. All such documents are available to the public upon request; costs for copies may be collected. This includes materials that may contain sensitive data or other information, and Baker County will not be held liable for its distribution.



1995 Third Street
Baker City, Oregon 97814

December 14, 2018

Kellen Tardaewether, Senior Siting Analyst
Oregon Department of Energy
550 Capitol St. N.E., Salem
Sent via e-mail to Kellen.Tardaewether@oregon.gov

RE: Baker County Comments on the Complete ASC

Ms. Tardaewether and the Energy Facility Siting Council,

Baker County is providing comments on the ASC submitted by Idaho Power Company ("IPC") filed September 28, 2018. The comments are specific to Exhibits K, L, R and U. This letter provides a review of the proposed facility's "compliance with applicable statutes, rules and ordinances, issues significant to [the County], and recommended site conditions." Baker County extends our thanks again to the Energy Facility Siting Council for approving Baker County to use a subcontractor, David Petersen with Tonkon Torp, for this set of comments. The timing of this comment period was inopportune for the County, and the subcontractor's assistance and expertise were invaluable to us. These comments are more complete and focused than would have been possible without Mr. Petersen's assistance, which will ultimately benefit Idaho Power, ODOE staff and the Council. We appreciate the Council allowing this opportunity.

Before getting into the specifics of our agency review comments, its important to acknowledge that Baker County continues to believe the project would not be appropriate in Baker County. The totality of the impact to our landowners, agricultural lands, resources, and viewsheds has not been appropriately mitigated through the measures proposed in this document. Baker County will not receive a direct benefit from the project; the closest analogy would be allowing a developer to build an interstate highway through Baker County without installing any on or off ramps. The totality of the impacts to land and tourism values are not taken into consideration by IPC. However, the agency report requested by the Oregon Department of Energy is focused on obtaining information about the ASC, and accordingly Baker County will focus our comments on the ASC document rather than the larger picture of project suitability.

Exhibit K

Section 4.0

On page K-28, IPC describes measures that will be taken after construction to restore agricultural land, as nearly as possible, to former productivity. Specific measures will be outlined in the final Agricultural Assessment. Land Use Conditions 1 and 15, in turn, require IPC to obtain ODOE approval of the final Agricultural Assessment and to implement the mitigation measures described therein "during construction." Presumably those measures will include measures to restore agricultural land.

In its May 25, 2018 memorandum responding to IPC's responses to comments and requests for additional information, Baker County advocated for amendment of Land Use Condition 1 to require that the final Agricultural Assessment be provided to Baker County, so that the final mitigation measures could be reviewed for sufficiency. The County notes that EFSC promises in its memorandum of October 1, 2018 to share final plans with the SAGs for review and comment, which presumably includes the final Agricultural Assessment. Given this, there should be no objection to making the obligation to provide the final Agricultural Assessment to Baker County an express requirement of Land Use Condition 1, and Baker County reiterates this request.

The same rationale applies to the Helicopter Use Plan under Public Services Condition 2 and the County-specific transportation and traffic plan under Land Use Condition 12. These conditions should require copies of the final plans be given to Baker County (and in the case of the Helicopter Use Plan, the other SAGs). Also, Land Use Condition 12 should specifically require IPC to post a bond for the benefit of the County to secure the cost of any repairs to County roads that are necessary following IPC's construction activities.

Since some of the agricultural land restoration measures to be described in the final Agricultural Assessment expressly will take place after construction is complete, Land Use Condition 15 should be amended accordingly to require compliance with the Agricultural Assessment both during and after construction.

Section 6.8

Baker County agrees that the ASC identifies all applicable Baker County substantive land use criteria.

BCZSO 401(B)(1) does not establish a setback. It is a frontage requirement. All affected properties with buildings (i.e., multi-use areas and communications stations) in Baker County must be located on a property at least 220 feet wide at the property line in front of the buildings. IPC's analysis does not evaluate the frontages of the properties hosting the multi-use areas and communication stations in Baker County, so the County cannot evaluate whether this criterion is met.

The County setbacks set forth in BCZSO 401(B) apply to all "structures" as defined in BCZSO 108a(B). Land Use Condition 25 attempts to require compliance with these setbacks, but does not use the term "structures." Instead, IPC's proposed language applies the setbacks only to "buildings" and "the fixed bases of transmission towers," on the theory that these are the only kinds of "structures" that will be built in Baker County as part of the project. That may be, but the

condition should nonetheless impose the setbacks on all "structures" as defined in the BCZSO, so as to capture any other structures that may not be anticipated as part of the project at this time. Each of clauses a. through d. of Land Use Condition 25 should be changed to apply the setbacks to all "structures" as that term is defined in BCZSO 108a(B).

In response to BCZSO 412 on pages K-295 to K-298, IPC identifies the Virtue Flat Mining Area as a County historical resource (see Figure K-50) but provides no analysis of the impact of the project on this resource. Accordingly, the County cannot fully evaluate the project's compliance with BCZSO 412.

With respect to the Virtue Flat Oregon Trail historic resource designated by Baker County, the ASC defers a full evaluation of impacts to the final Visual Assessment of Historic Properties Study Plan (VAHP). The rationale set forth above for the proposed change to Land Use Condition 1 regarding the final Agricultural Assessment, applies equally to Historic, Cultural, and Archaeological Resources Condition 2 (Exhibit S) and the final Historic Property Management Plan. To permit the County to meaningfully evaluate the proposed mitigation for impacts on County-designated historic resources, Historic, Cultural, and Archaeological Resources Condition 2 should be modified to require a copy of the final Historic Property Management Plan be provided to the County (and other SAGs).

With respect to the Flagstaff Hill Monument historic resource designated by Baker County, the ASC merely concludes on page K-297 that "the Project will not affect the characteristics that make the monument important," but does not explain what those important characteristics are or how the Project will not affect them. This conclusory statement is insufficient for the County to evaluate whether IPC is justified in deciding to not conduct further analysis of this resource.

On page K-307, IPC commits to managing noxious weeds consistent with ORS 569.350 through 569.450 and the Baker County Noxious Weed Management Plan. Fish and Wildlife Condition 6, in turn (Exhibit P), obligates IPC to obtain final ODOE approval of its Noxious Weed Plan. Again, the rationale for providing final plans to the County (and other SAGs) applies here – Baker County should have the opportunity to review the final plan to ensure it complies with the Baker County Noxious Weed Management Plan. Fish and Wildlife Condition 6 should be revised accordingly.

Also with respect to weed control, Baker County reiterates its recommendation that a condition of approval be adopted obligating IPC to provide a bond specifically to secure its weed management obligations. This bond should remain in place until 10 years after construction of the project is complete. While Exhibit W requires a general retirement and restoration bond, weed management is an ongoing obligation during project construction and operation, not just an obligation associated with retirement and decommissioning.

Land Use Condition 11c. only requires IPC to consult with the County when a County ROW permit is required. Baker County requests that Land Use Condition 11c. be modified to require that any work in a Baker County ROW (whether requiring a County ROW permit or not) be coordinated with the County to minimize impacts to other users of those ROWs. This change would be consistent with Public Services Conditions 1 and 8.

Exhibit L

Baker County finds IPC's analysis of visual impacts at the National Historic Oregon Trail Interpretive Center (NHOTIC) to be unpersuasive and insufficient. The County does not believe the mitigation required by Scenic Resources Condition 2 would reduce the visual impacts of the project on NHOTIC below significance.

Baker County reiterates its previous recommendation that IPC evaluate the feasibility of undergrounding the transmission line in the vicinity of NHOTIC. Scenic Resources Condition 2 requires above-ground visual mitigation for 1.6 miles of transmission line (from MP 145.1 to MP 146.7). This is a short distance, particularly compared to the 300-mile length of the entire project. Exhibit BB Section 3.4 dismisses undergrounding the entire project as cost-prohibitive, but no feasibility study has ever been conducted to quantify that additional cost for just the 1.6 miles at issue near NHOTIC. Without a location-specific analysis of the cost and feasibility of undergrounding the line in the vicinity of NHOTIC and an evaluation of the superior mitigation that would result, ODOE cannot conclude that the proffered above-ground mitigation is the best option to mitigate impacts. This is particularly true given the prominent stature of NHOTIC, the critical importance of this visual resource and the close proximity of the project to NHOTIC (less than 125 feet to the centerline of the transmission line route, according to Table L-2).

Exhibit R

Baker County reiterates its concerns regarding the significant impact of the proposed project on NHOTIC, as discussed above regarding Exhibit L.

Baker County also reiterates its concern, originally expressed in its comment letter dated October 2, 2017, regarding the proposed route near the community of Durkee and the Burnt River Canyon area owned by BLM (identified in Exhibit R as scenic resource VRM B3). Baker County believes that route selection near Durkee overemphasized resource values on the BLM property and improperly minimized impacts to nearby private agricultural lands, thereby avoiding BLM property to the maximum extent possible. The proposed route also unnecessarily bisects agricultural parcels to the detriment of the landowners despite the fact that alternative routes across those parcels with less adverse impacts are available. Baker County and IPC have reached an agreement in principle to amend the proposed route in the general vicinity of Durkee so that the route, while still on private agricultural lands, has less adverse impacts to Goal 3 values; however, as currently described in the ASC, the proposed route does not implement that agreement. Consequently, Baker County finds that the analysis in Exhibits K and R, and elsewhere in the ASC, with respect to the proposed route near Durkee is insufficient to comply with Oregon's protections afforded agricultural land under Goal 3.

Exhibit U

Baker County reiterates its concerns expressed in prior comments that the ASC provides insufficient mitigation for fire risk and medical emergencies. With respect to fire, much of the land in Baker County has minimal fire protection available. The scale of the map in Figure U-4 is too large to be able to specifically determine jurisdictional boundaries; however, in review of the

map, Baker County finds it likely that there are two fire response jurisdictions that were not identified. Baker County requests that IPC investigate the impact the project may have on the Huntington Fire Department and the Lookout-Glasgow Rangeland Fire Protection Association. Also, the narrative describing fire response on page U-16 states, "For private lands within the analysis area, fire protection and response falls to one of the 9 organizations listed in Table U-10." Baker County disagrees with this statement; while the large scale of the map makes it impossible to be certain, it is likely that at least portions of the project fall inside the response area of the two jurisdictions listed above, as well as outside the service area of any fire district or association. Page U-16 includes the statement: "*Not all lands fall within a designated fire district. In those cases, the closest or best situated fire district responds to fires.*" While that may be true under ideal circumstances, in areas outside of a fire district or association, there is no guarantee of fire response. Mutual aid agreements as used in this context are between two fire response organizations who have like resources to 'trade', they are not made to cover lands that don't fall within any jurisdiction's response territory.

Furthermore, Table U-10 states that ODF can achieve response times of 15-30 minutes to the project site, but this statement is not supported by any evidence. The two notes of conversations with ODF in Attachment U-1 say nothing about response times. Fire response to portions of the project area in Baker County could extend to 1-2 hours if there is any response at all. The potential for fire spread in hot, dry and/or windy conditions is enormous, making a 1-2 hour response time unacceptable for high fire-risk activities such as project construction. Baker County believes Table U-10 is inaccurate and unreasonably optimistic regarding fire response potential in more remote areas of the County.

Page U-17, footnote 1, states the Burnt River Rangeland Fire Protection District could not be reached because no contact information was available on the Oregon Fire Agency List maintained by the Oregon State Fire Marshal's office. The most likely reason Burnt River RFPA is not included on this list is they are a Rangeland Fire Protection Association rather than a Rural Fire District, and they are formed under the Oregon Department of Forestry rather than the Oregon State Fire Marshal's office. If IPC contacts the Oregon Department of Forestry or Baker County, either can help establish contact with the RFPA, but IPC failing to make contact and establish impact with the impacted service providers cannot provide the Council enough information to evaluate the standard identified in OAR 345-021-0010 (1).

Baker County disagrees with the statement on page U-24 that the project will not have significant impacts on fire protection services. The first paragraph under Section 3.5.6.2, after making that statement, describes precisely why the fire protection impact is significant – most construction will occur during hot and dry weather, when fire risk is highest, in grassland and shrub-dominated landscapes particularly vulnerable to fire. Project construction involves many potential fire-inducing activities including use of motorized vehicles and equipment, welding, refueling and smoking. As we know from the last few summers, fire risk is already elevated in eastern Oregon even without introducing increased fire hazards into remote areas.

Given the high fire risk and the minimal available public services, IPC needs a more robust Fire Prevention and Suppression Plan. Giving construction workers a few hours of training plus a shovel, ax, fire extinguisher and some water is not sufficient. Additionally, page U-25 says,

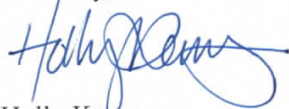
“Construction workers are maintenance personnel are not trained firefighters and not expected to fight fires.” Instead, IPC should be required to provide meaningful mitigation for the impact, such as a full complement of fire protection equipment and trained firefighting personnel on site during construction, as well as an emergency plan coordinated with the County Emergency Management staff.

With respect to medical emergencies, Exhibit U lacks critical information that is needed to evaluate the standard identified in OAR 345-021-0010. IPC fails to identify relevant health care providers, including Saint Alphonsus Medical Center in Baker City, and does acknowledge first responders as health care providers. Ambulance service, or Life Flight air service, are the critical link between medical emergency and hospital. Response times to some portions of the project route can exceed one hour, which could then be followed by long travel to a hospital in Baker City, La Grande, Ontario or even Boise depending on the event. To improve response time, IPC should be required to develop a specific Medical Response Plan and have all onsite project managers carry a copy of the plan at all times. The plan should specifically require advance notice to ambulance and life-flight services of active construction locations, and should pre-identify life-flight landing locations near the work zone. If predicted response times are likely to adversely impact an ambulance service provider’s ability to provide services, and it’s reasonable to believe having an ambulance committed to a call for multiple hours will, IPC is required to mitigate the impact.

Lastly, conditions of approval should be imposed requiring that both the final Fire Prevention and Suppression Plan and Medical Response Plan be provided to Baker County (and other SAGs) for review and comment, as discussed above regarding other plans still in draft format.

If you have any questions or would like further information on Baker County’s comments, please contact me by calling 541-523-8219 or by e-mail at hkerns@bakercounty.org.

Sincerely,



Holly Kerns
Planning Director

B2HAPPDoc13-18 ASC Reviewing Agency Comment ODOT Davis



Oregon
Kate Brown, Governor

Department of Transportation

District 14

1390 SE 1st Avenue

Ontario, OR, 97914-2945

Phone: (541) 823-4017

Fax: (541) 889-6600

Email: thomas.j.davis@odot.state.or.us

TO: Kellen Tardaewether
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301

FROM: Tom Davis, District 14 Operations Coordinator
Oregon Department of Transportation
1390 SE 1st Avenue
Ontario, OR 97914
(541) 823-4017
Thomas.j.davis@odot.state.or.us

DATE: December 21, 2018

RE: Oregon Department of Transportation Follow-up to our November 23, 2018 Comments for the Site Certificate for the Boardman to Hemingway Transmission Line

Kellen: this is a follow-up to our phone conversation and email on December 7, 2018. We have been working with Idaho Power on the Rock Quarries and the I-84 Right of Way/Access. We did provide Idaho Power with GIS data on the Rock Quarries and Scenic Byways. We also used the Idaho Power data to map their facilities to show conflicts with our Rock Quarries. I have included maps of those that are still in conflict.

Aggregate Sites: Based upon data provided by Idaho Power, and incorporated into the exhibits, the transmission line alignment and micro-siting corridor do not cross through, and are not directly adjacent to, the boundaries of the following material sources:

- South Nye Junction Quarry
- Spring Creek Quarry
- Clover Creek Quarry
- Jimmy Creek Quarry
- Pleasant Valley Quarry
- Love Reservoir Quarry
- Tub Mountain Quarry
- Vines Hill Quarry

One quarry, Baldock Slough East, is traversed by the micro siting corridor at two locations. As per discussions with Idaho Power, the proposed transmission line alignment should be adjusted within the micro siting corridor to avoid traversing the quarry boundary directly, Furthermore, we must once again reiterate that if engineering based buffers are required around tower and transmission lines to protect these facilities from impacts attributable to quarry operations, the proposed alignment must be placed outside of these buffers.

Three material sources, Palmer & Denham Quarry, Durbin Quarry and Pine Creek Ridge Quarry are in direct conflict with the proposed transmission line alignment. Palmer & Denham Quarry is privately owned and occupied by ODOT via a 99 year lease. I have attached current information, forwarded by the ODOT Region 5 ROW office, for this site. Durbin and Pine Tree Ridge Creek Quarry are both BLM owned and ODOT Controlled, by deed of right of way. The BLM granted ODOT the control of 70 acres for Durbin Creek Quarry in 1966. In 1955, the BLM granted ODOT control of 120 acres for Pine Tree Ridge Creek Quarry. In December 1955, ODOT purchased an additional 4.77 acres of quarry land and 4.92 acres for use as a haul road. Another thing that needs to be clearly understood is that, for the sites shown as BLM owned and, ODOT controlled, ODOT has an existing right of way (R/W) for use of that site through Federal Highway. BLM cannot issue another RW over top of our use that will impact our use as a material source unless agreed upon by ODOT. So, unless the proposed powerline alignment is within an existing easement or right of way previously approved and predating our rights to these sites, BLM will have to request ODOT concurrence before issuing a conflicting RW. ODOT has clearly and repeatedly stated that having towers in or close to these sites, or having lines above these sites is an impact to future operations, and as such ODOT would not agree to any impact to these sites. This is a regulatory protection of the existing use of both sites and has been noted as a "yes" in the included table.

Source Number:	OR-01-039-5	OR-01-037-5	OR-01-064-5	OR-23-003-5
Quarry Name:	Baldock Slough East	Palmer & Denham	Durbin Quarry	Pine Creek Ridge
Ownership:	ODOT	Palmer & Denham	BLM	BLM & ODOT
County:	Baker	Baker	Baker	Malheur
DOGAMI #:	-	-	-	-
Conditional Use Permit:	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Land Use Approval:	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Existing legal or regulatory protections:	Not Applicable	Not Applicable	Yes - Deed of ROW	Yes - Deed of ROW
Location:	NE1/4 NE1/4 Sec 24, T8S, R40E, Willamette	SW 1/4 NW 1/4 Sec 1, T10S, R40E, Willamette	NE 1/4 NE1/4 Sec 23, T14S, R44E, Willamette	NE 1/4 SW 1/4 NW 1/4 Sec 34, T15S, R45E, Willamette
EFSC Comment:	Public Services	Public Services	Public Service	Public Services

Regarding Goal 5 - not all counties have addressed sites the same way. Since 1996 counties have been required to maintain countywide assessments of significant aggregate sites. Aggregate sites are added to a local inventory of significant sites in response to an application. It is therefore not sufficient to rely on county inventories to identify aggregate sites that are important to the long term maintenance of Oregon's highways. So again the comment regarding the sites listed in the ODOT letter as not being shown on County Goal 5 Inventories is misleading. Granted some of these sites are small, maybe have limited reserves, but that does not decrease the value or the need for ODOT to be able to utilize these sites as needed when needed. Not being shown on a county Goal 5 inventory doesn't mean the site is not there and that it has value, or that a transmission line will not impact the potential use of the site.

I-84 Right of Way: In our conversation with Idaho Power, they have no intentions of working within the Interstate right of way. They understand that they cannot encroach, work within, construct features or have access within the Interstate right of way. They also understand that they will need to apply for and be approved for permits as outlined in previous letters.

Scenic Byways: The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) established the National Scenic Byways Program, implemented by FHWA. Under the National Scenic Byways Program, (23 U.S.C. 162) a roadway can be designated as a State Scenic Byway, a National Scenic Byway, or an All-American Road based upon intrinsic scenic, historic, recreational, cultural, archeological, or natural qualities. A road must exemplify the criteria for at least one of these six intrinsic qualities to be designated a National Scenic Byway. For the All-American Roads designation, criteria must be met for a minimum of two intrinsic qualities. The jurisdiction of the municipal, county, State, tribal, or Federal Governments that govern the designated highway and the lands adjacent to it remains unchanged. The byway's intrinsic qualities are typically protected by those jurisdictions.

To be designated a scenic byway, a strong local commitment must be “provided by communities along the scenic byway that they will undertake actions, such as zoning and other protective measures, to preserve the scenic, historic, recreational, cultural, archeological, and natural integrity of the scenic byway and the adjacent area as identified in the corridor management plan.” Understanding how a byway's resources contribute to the visual quality of the project corridor is an important factor in conducting a Visual Impact Analysis for a project that affects a designated scenic byway. You can find more information on the National Scenic Byways Program and federally designated scenic routes at FHWA's America's Byways website:
<http://www.fhwa.dot.gov/byways/>

As described in Section 2.3.1, National Scenic Byways Program, local city, county, or State DOTs provide protective measures for federally designated scenic routes. Cities, counties, and States may have other officially designated scenic routes. These scenic routes are often listed and described under each State DOT's website or within city and county general and specific plans. There may also be local ordinances pertaining to scenic routes or other designated scenic areas, such as historic roads and streets. Authors should become familiar with the regulations and customs that dictate how the visual quality of these routes and areas are managed.

Hells Canyon (All American Roads) Scenic Byway Corridor Management, Journey Through Time Tour Route Management Plan, The Grande Tour Route Management Plan and the Elkhorn Drive National Forest Scenic Byway Management Plan were not analyzed for impacts in the Application for Site Certification.

In Exhibit R, Table R-1 page R-16 incorrectly states that in the ODOT Plans, Scenic Resources are not identified, when in fact each plan clearly describes the scenic resources available. Additionally, the Corridor Management Plans do show one or more of the following intrinsic qualities: scenic, historic, recreational, cultural, archeological, or natural.

Boardman to Hemingway Transmission Line Project

Exhibit R

Jurisdiction	Plan	Scenic Resources Identified? (Y/N)	Name of Scenic Resource	Location in Plan	Location of Scenic Resource	GIS ID No.	Analyzed in Exhibit R? (Y/N)
Oregon Department of Transportation	Hells Canyon Scenic Byway Corridor Management Plan (Eastern Oregon Visitors Association/ Hells Canyon Scenic Byway Committee, 2004)	N	N/A	III. Intrinsic Qualities and Context Statement	N/A	N/A	N
Oregon Department of Transportation	Journey Through Time Tour Route Management Plan (Michael Wetter and Associates 1996)	N	N/A	Background: Vision, Goals, Objectives	N/A	N/A	N
	No corridor management plan	N	N/A	II. Resource Inventory	N/A	N/A	N
	Elkhorn Drive National Forest Scenic Byway Management Plan (1996)	N	N/A	Resource Inventory	N/A	N/A	N
TRIBAL							
Confederated Tribes of the Umatilla Indian Reservation (CTUIR)	Comprehensive Plan for the Confederated Tribes of the Umatilla Indian Reservation (2010)	N	None identified	5. Plan Elements: Goals & Objectives	N/A	N/A	N

On page R-37 of the Application, Idaho Power reviewed the plans a mistakenly did not identify scenic resources as significant or important.

1. Hells Canyon Scenic Byway Corridor Management Plan

- Intrinsic Qualities and Context Statement' includes a description of the scenic quality that is of national significance.
- Visual Resource Management, includes visual quality goals, objectives, character types, distance zones (foreground 3000'-½ mile, middle-ground ½ to 4 miles, background 4 miles to horizon), variety classes and sensitivity levels.
- Existing Recreational Facilities describes scenic views and landmarks

2. Journey Through Time Management Plan

- A Few Highlights includes scenic locations
- Points of Interest and Enhancement/Protection Projects – includes scenic resources

3. Elkhorn Drive Scenic Byway Management Plan

- Resource Inventory identifies scenic resources.

4. The Grande Tour Route Management Plan

- Scenic Qualities;
- Vision, Goals and Objectives;
- Protection strategy;
- Enhancement strategy - all identify scenic resources

Idaho Power should include an analysis on these scenic byways to insure that they will not be impacted by the project.

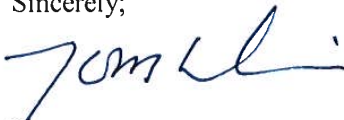
In Exhibit L an example was found for the protected area of the Oregon Trail ACEC - National Historic Oregon Trail Interpretive Center which is adjacent to the Hells Canyon Scenic Byway Corridor. The Analysis Area in Table L-2 page L-28 has a Visual Impact Intensity Level Medium. Idaho Power under mitigation 3.6 page L-43-L-45 has addressed mitigation to satisfy the requirements of OAR 345-022-0080. The mitigation was making adjustments in the transmission line route along with the type of structure. Without performing an analysis on the impacts to the Scenic Byways, however, we are not able to determine the full impacts. Idaho Power should perform an analysis to determine if the project will result in significant adverse impact to the scenic resources and values of the Scenic Byways.

Kellen; we have been in touch with the Counties to request information on their Goal 5 on Aggregate and Scenic Resources. Due to the holidays, I have been told that it would be after the first of the year before we get the needed information from the Counties.

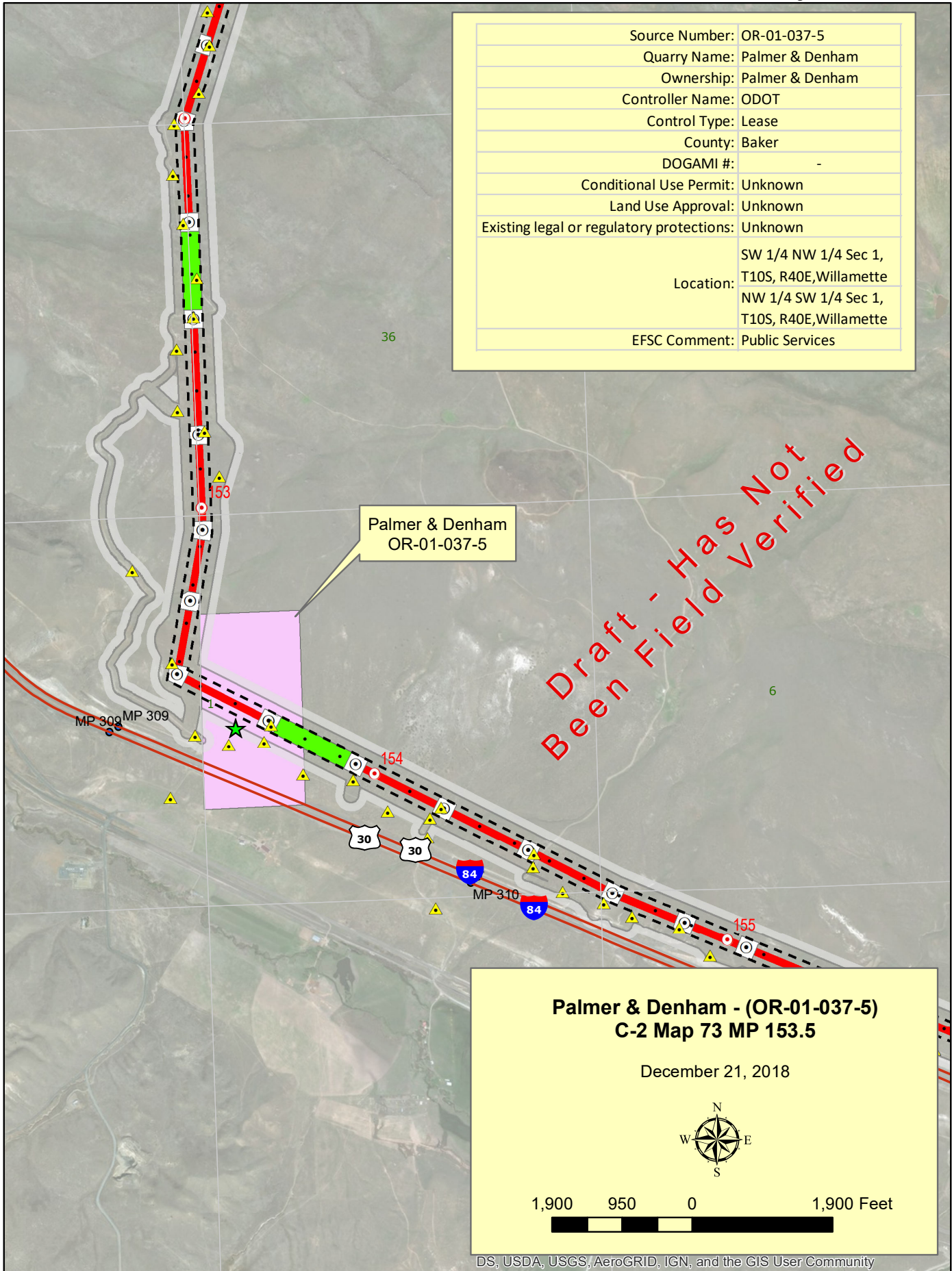
We are continuing to put together the needed information. We have a conference call with Idaho Power on January 7th to further discuss the rock quarries.

We will also need to continue working with you on trying to have an analysis performed on the scenic byways.

Sincerely;



Tom Davis;
District 14 Operation Coordinator



Source Number:	OR-01-037-5
Quarry Name:	Palmer & Denham
Ownership:	Palmer & Denham
Controller Name:	ODOT
Control Type:	Lease
County:	Baker
DOGAMI #:	-
Conditional Use Permit:	Unknown
Land Use Approval:	Unknown
Existing legal or regulatory protections:	Unknown
Location:	SW 1/4 NW 1/4 Sec 1, T10S, R40E, Willamette NW 1/4 SW 1/4 Sec 1, T10S, R40E, Willamette
EFSC Comment:	Public Services

Palmer & Denham
 OR-01-037-5

*Draft - Has Not
 Been Field Verified*

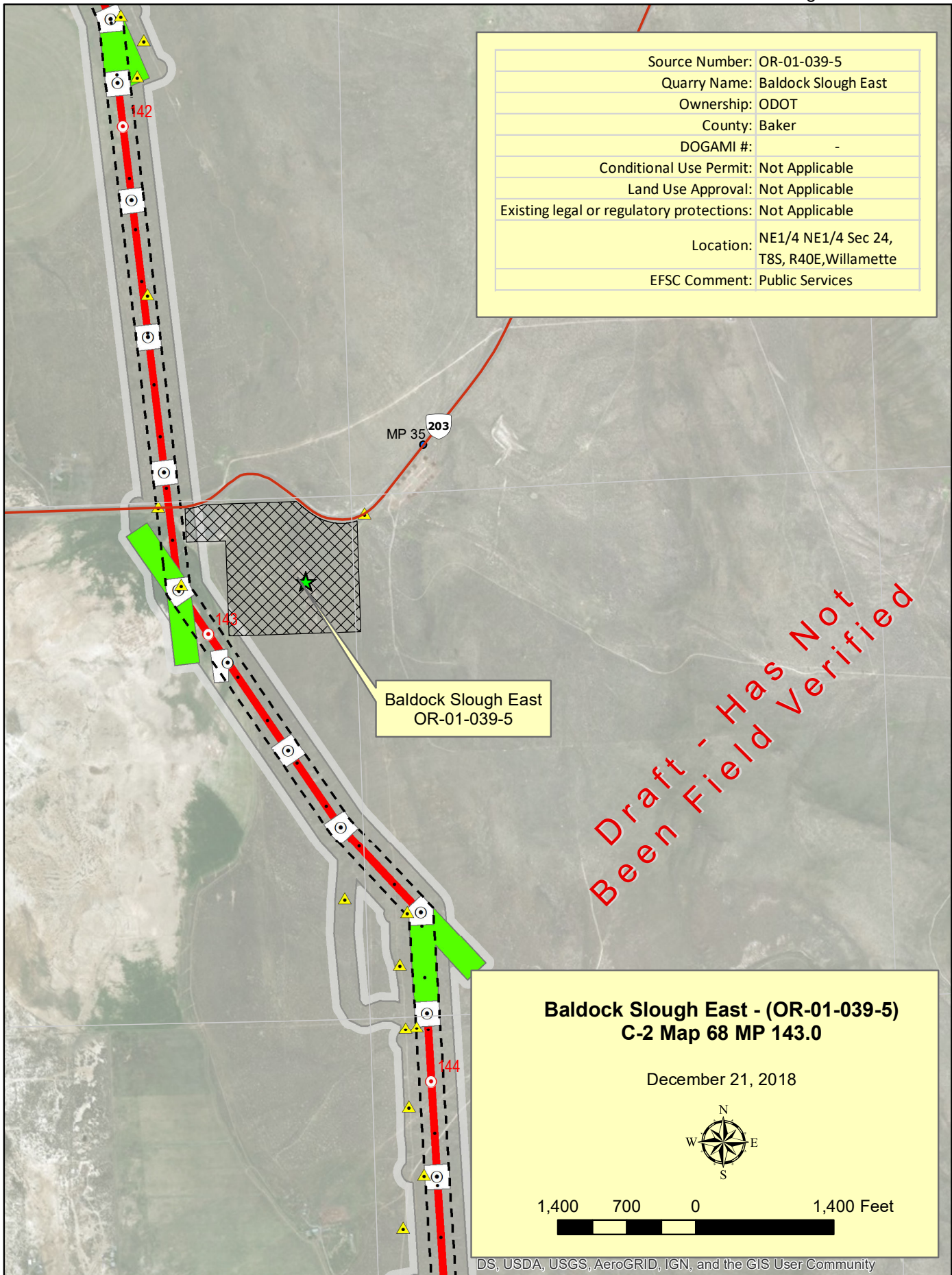
Palmer & Denham - (OR-01-037-5)
C-2 Map 73 MP 153.5

December 21, 2018

1,900 950 0 1,900 Feet

DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Source Number:	OR-01-039-5
Quarry Name:	Baldock Slough East
Ownership:	ODOT
County:	Baker
DOGAMI #:	-
Conditional Use Permit:	Not Applicable
Land Use Approval:	Not Applicable
Existing legal or regulatory protections:	Not Applicable
Location:	NE1/4 NE1/4 Sec 24, T8S, R40E, Willamette
EFSC Comment:	Public Services

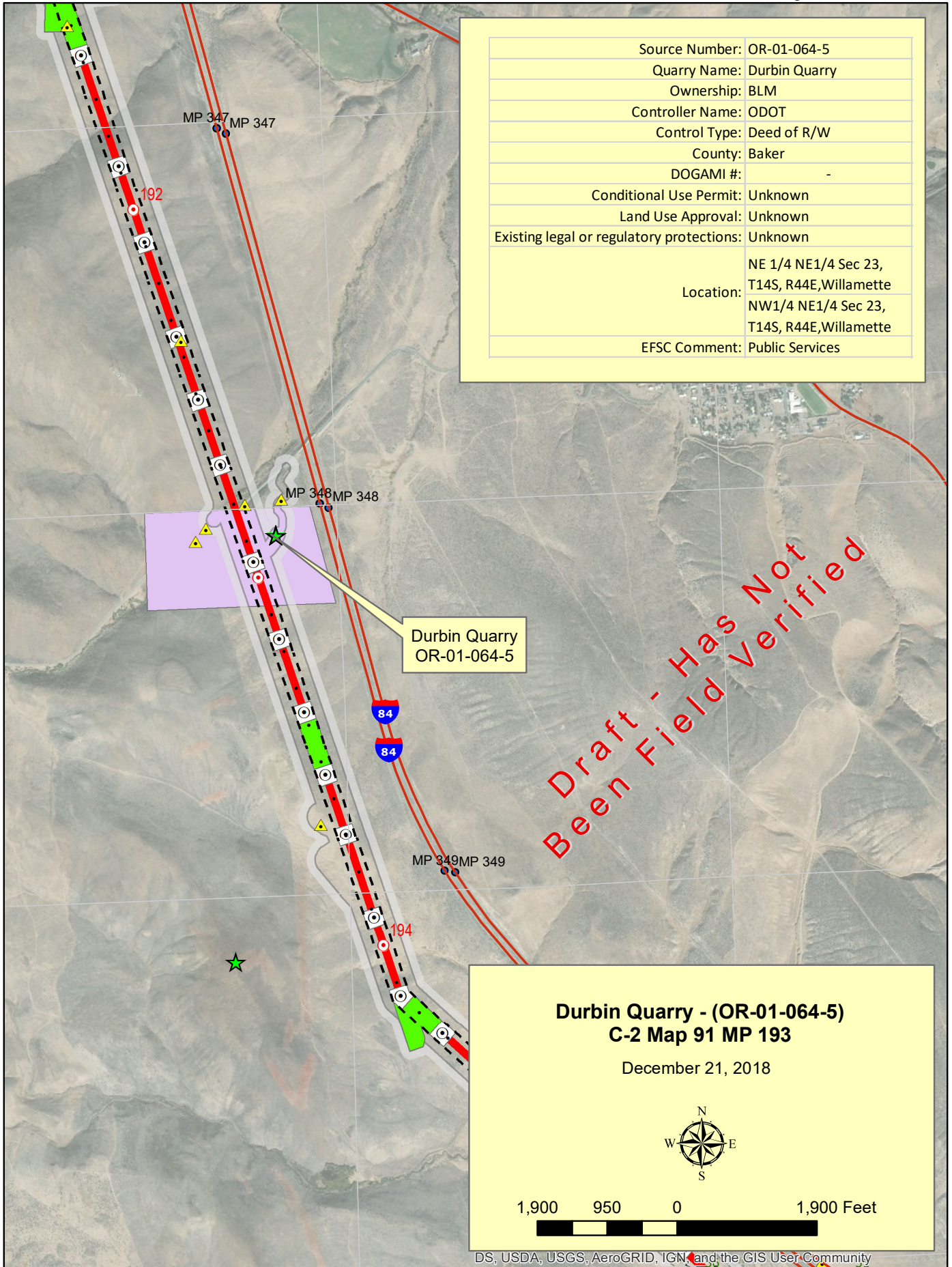


Baldock Slough East
OR-01-039-5

Baldock Slough East - (OR-01-039-5)
C-2 Map 68 MP 143.0

December 21, 2018

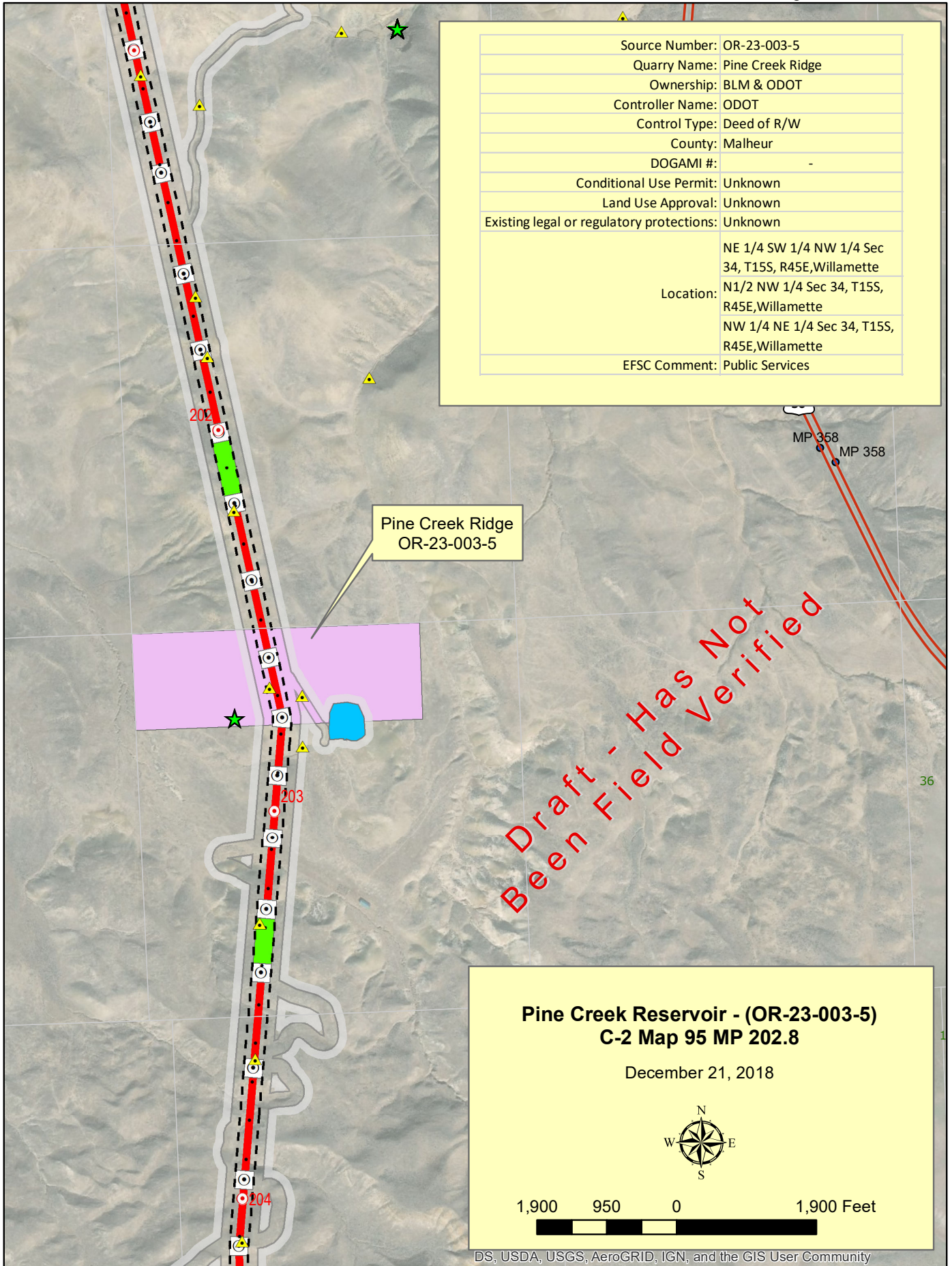
1,400 700 0 1,400 Feet



Source Number:	OR-01-064-5
Quarry Name:	Durbin Quarry
Ownership:	BLM
Controller Name:	ODOT
Control Type:	Deed of R/W
County:	Baker
DOGAMI #:	-
Conditional Use Permit:	Unknown
Land Use Approval:	Unknown
Existing legal or regulatory protections:	Unknown
Location:	NE 1/4 NE1/4 Sec 23, T14S, R44E, Willamette NW1/4 NE1/4 Sec 23, T14S, R44E, Willamette
EFSC Comment:	Public Services

Durbin Quarry - (OR-01-064-5)
C-2 Map 91 MP 193
 December 21, 2018

1,900 950 0 1,900 Feet



Source Number:	OR-23-003-5
Quarry Name:	Pine Creek Ridge
Ownership:	BLM & ODOT
Controller Name:	ODOT
Control Type:	Deed of R/W
County:	Malheur
DOGAMI #:	-
Conditional Use Permit:	Unknown
Land Use Approval:	Unknown
Existing legal or regulatory protections:	Unknown
Location:	NE 1/4 SW 1/4 NW 1/4 Sec 34, T15S, R45E, Willamette N1/2 NW 1/4 Sec 34, T15S, R45E, Willamette NW 1/4 NE 1/4 Sec 34, T15S, R45E, Willamette
EFSC Comment:	Public Services

Pine Creek Ridge
 OR-23-003-5

**Draft - Has Not
 Been Field Verified**

**Pine Creek Reservoir - (OR-23-003-5)
 C-2 Map 95 MP 202.8**

December 21, 2018

1,900 950 0 1,900 Feet

DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

B2HAPPDoc13-21 ASC Reviewing Agency Comment ODFW_Reif 2019-01-25

TARDAEWETHER Kellen * ODOE

From: Sarah J Reif <Sarah.J.Reif@state.or.us>
Sent: Friday, January 25, 2019 8:14 AM
To: TARDAEWETHER Kellen * ODOE; WOODS Maxwell * ODOE
Subject: RE: Boardman to Hemingway EFSC Request on Complete Application
Attachments: B2HAPP ASC Reviewing Agency_ODFW Comments 01.25.19.pdf

Kellen and Max,

Attached you will find ODFW's review and comment on the B2H application for site certificate. We greatly appreciate your patience, and that of the applicant. As always, I'm available to discuss any questions you may have regarding these comments. Thanks, and have a great weekend!

Sarah Reif
Office: 503-947-6082
Cell: 503-991-3587

From: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Sent: Wednesday, October 10, 2018 4:48 PM
To: BLEAKNEY Leann <lbleakney@nwcouncil.org>; CANE Jason <jason.cane@state.or.us>; MILLS David <david.mills@state.or.us>; JOHNSON Jim * ODA <jjohnson@oda.state.or.us>; jeff.caines@aviation.state.or.us; svelund.greg@deq.state.or.us; nigg.eric@deq.state.or.us; SEIDEL Nigel E <Nigel.E.Seidel@state.or.us>; MYATT Nick A <Nick.A.Myatt@state.or.us>; REIF Sarah J <Sarah.J.Reif@state.or.us>; WANG Yumei * DGMI <Yumei.WANG@oregon.gov>; EDELMAN Scott <scott.edelman@state.or.us>; JININGS Jon <jon.jinings@state.or.us>; MURPHY Tim <timothy.murphy@state.or.us>; BROWN Lauren <Lauren.BROWN@state.or.us>; CARY Dan <dan.cary@state.or.us>; Thomas.J.Davis@odot.state.or.us; BEALS Alice * OPRD <Alice.Beals@oregon.gov>; MULDOON Matt <Matt.MULDOON@state.or.us>; HANHAN Nadine <nadine.hanhan@state.or.us>; LGKHOHO@puc.state.or.us; POULEY John * OPRD <John.Pouley@oregon.gov>; ALLEN Jason * OPRD <Jason.Allen@oregon.gov>; SAUTER Jerry K <Jerry.K.SAUTER@state.or.us>; Natalie Perrin <nperrin@hrassoc.com>; Kara_Warner@golder.com; Brad Bowden <bbowden@hrassoc.com>; cityofadrian@hotmail.com; kpettigrew@cityofboardman.com; ecpl@centurytel.net; karen@islandcityhall.com; rstrope@cityoflagrande.org. <rstrope@cityoflagrande.org>; cityadmin@cityofcove.org; tamra@umatilla-city.org; bob@umatilla.org; town055@centurytel.net; teri.bacus@cityofpilotrock.org; citymanager@cityofstanfield.com; admin@cityofunion.com; rnudd@bakercity.com; bsmith@hermiston.or.us; ddrotzmann@hermiston.or.us; manager@ci.irrigon.or.us; mayor@cityofvale.com; klamb@cityofvale.com; haines@cascadeaccess.com; TOKARCZYK John A * ODF <John.A.TOKARCZYK@oregon.gov>
Subject: Boardman to Hemingway EFSC Request on Complete Application

Good afternoon,

On September 21, 2018, the Oregon Department of Energy (ODOE), as staff to the Energy Facility Siting Council (EFSC), determined that Idaho Power Company's (applicant) amended preliminary application for a site certificate for the Boardman to Hemingway Transmission Line is complete. You have been identified as a reviewing agency for the Boardman to Hemingway Transmission Line and have been sent a copy of the complete application for site certificate (ASC) by the applicant along with a copy of an ODOE Request for Agency Report Memo. I have attached that memo to this email for your convenience. The Request for an Agency Report on the ASC is associated with compliance and recommended site certificate conditions for the proposed facility.

The deadline for agency comments on the ASC associated with compliance is Monday, November 26, 2018.

If you have not received a copy of the application in electronic and/or print format in the mail, please notify me. The ASC is also available on the [ODOE project webpage](#). ODOE will host a series of [informational meetings](#) next week along the proposed route, you are encourage to attend, if you like.

I have spoken with many of you already to coordinate a time to discuss this review request. If you have questions, I am more than happy to have an in-person meeting or a call to go over the process, review request or the application. Thank all of you!

Kellen

Kellen Tardaewether

Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
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Kate Brown, Governor



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TO: Kellen Tardaewether
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301

FROM: Sarah Reif, Energy Coordinator
Oregon Department of Fish and Wildlife
4034 Fairview Industrial Drive SE
Salem, Oregon 97302
503-947-6082
sarah.j.reif@state.or.us

DATE: January 25, 2019

RE: Oregon Department of Fish and Wildlife Agency Report on the Application for Site Certificate for the Boardman to Hemingway Transmission Line

General Comments:

Thank you for the opportunity to review the Boardman to Hemingway (B2H) Transmission Line Application for Site Certificate (ASC). The Oregon Department of Fish and Wildlife (ODFW) has appreciated the high level of coordination with Idaho Power Company (IPC) and Oregon Department of Energy (ODOE) on this project since its inception; coordination that was facilitated by the B2H Coordinator position formerly housed in the ODFW field office in La Grande. In general, ODFW found this ASC to be thorough and well-constructed, and IPC has addressed many of ODFW's prior concerns and recommendations provided during the Notice of Intent. Remaining comments and recommendations are provided below.

Many of the fish and wildlife conditions in the ASC are provisional at this time, subject to ODOE and ODFW review prior to construction (see Fish and Wildlife Conditions 1-9 and Other Information Condition 1). ODFW understands the need for provisional plans on a project of this scale, and that final surveys, impact assessments, avoidance and minimization measures, and mitigation plans cannot be finalized until the Right-of-Way (ROW) location can be finalized and access obtained. Given the provisional nature of the current ASC, comments and recommendations made by ODFW herein are subject to change based on the results of final surveys and final plans. Furthermore, ODFW anticipates significant workload for the agency in the pre-construction phase to review finalized plans. ODFW would appreciate a coordinated and sequenced schedule that offers adequate time for review prior to IPC's desired construction start date.

Specific Comments: Please see ODFW comments in the table provided below.

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
L	OAR 635-008-0120	Protected Areas	The project proposes to cross upland habitat on Ladd Marsh Wildlife Area (LMWA), which is land owned and managed by ODFW. There is an existing transmission line and natural gas pipeline also located on Ladd Marsh Wildlife Area, in close proximity to the proposed ROW. The location of the proposed crossing functions as winter habitat for big game, and therefore ODFW expects that the best management practices and mitigation plans for Big Game Winter Range (as described in Exhibit P1) will apply to lands within the LMWA as well. When the time comes for planning roads, gated access, and timing of construction activity, ODFW recommends those plans be coordinated with the Wildlife Area Manager.
L	ORS 97.740, ORS 358.905-358.962, ORS 390.235, and OAR 736-051-0080	Protected Areas	ODFW is aware of cultural resources in the vicinity of the proposed crossing of Ladd Marsh Wildlife Area. Under Oregon State Law (ORS 97.740, ORS 358.905-358.962, ORS 390.235, and OAR 736-051-0080) archaeological sites are protected on all non-federal public lands. To ensure compliance with applicable state cultural resource laws, ODFW requires Idaho Power contact the Oregon State Historic Preservation Office (SHPO) and provide documentation of concurrence from SHPO for the portion of the project that crosses Ladd Marsh Wildlife Area. If the overall project is determined by Idaho Power to have a federal nexus then documentation of compliance with relevant federal law, including Section 106 of the National Historic Preservation Act, may be provided instead.
P1	(standard ODFW comment)	Page 21; Condition 2 and 13	If construction activities encounter federally listed species covered by the Endangered Species Act, or those raptors and eagles covered the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, ODFW

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
			recommends IPC contact the U.S. Fish and Wildlife Service given their federal jurisdiction.
P1	OAR 635-022-0060; OAR 635-415-0025	Page 26; Section 3.3.2 Category 2 habitat	In the time that has passed since the original design of biological surveys for the B2H project, ODFW has identified pygmy rabbits as State Sensitive Species and has recommended mitigation for pygmy rabbits on other energy facility projects proposed in the sagebrush habitats of eastern Oregon. Pygmy rabbits are dependent on mature sagebrush and deeper soils, and given the conservation concern regarding their populations, ODFW has determined active pygmy rabbit colonies meet the definition of Category 2 habitat. ODFW understands that pygmy rabbits were not detected in the initial B2H surveys, where access was granted. However, ODFW recommends that pygmy rabbits be a part of pre-construction surveys, and if active pygmy rabbit colonies are found within areas proposed for temporary or permanent disturbance, ODFW recommends they be contacted. At that time, ODFW would work with IPC to explore avoidance options including spanning colonies, locating tensioning/pulling/fly yards outside of colonies, and assure that unavoidable impacts are mitigated according to policy.
P1, see also Exhibit BB Fish Passage	OAR 635-022-0060; OAR 635-415-0025; OAR 635-412	Page 73; Section 3.5.5.6	ODFW Fish Division and local District Fish Programs have reviewed this section, and based on the current application (subject to finalization prior to construction), ODFW finds fish impacts to be adequately considered and addressed. It is ODFW's understanding that fish passage plans and approvals have yet to be finalized prior to construction.
P1-3 Reclamation and	OAR 635-022-0060; OAR 635-415-0025	Page 20; Section 6.0 Reclamation success standards,	Revegetation and reclamation serve an important function in minimizing impacts to wildlife habitat. Some habitats that will be impacted by this project, namely sagebrush shrubland and forests, take upwards of 10 to 50

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
Revegetation Plan		monitoring, and maintenance	<p>years to recover their pre-disturbance form and function. IPC has offered a robust revegetation plan, however ODFW stands by its previous recommendation that reclamation/revegetation monitoring be performed for longer than 5 years post-construction. ODFW recommends IPC utilize an adaptive monitoring schedule and management plan that can address Project impacts as long as necessary to achieve success criteria.</p> <p>ODFW also finds IPC's proposed reclamation standards (Table 6) to be low relative to what ODFW has recommended and supported for other projects in similar habitats. Below are the recommendations ODFW made to ODOE for the B2H Notice of Intent, which we believe are still appropriate:</p> <p>[ODFW recommends the following criteria for reclamation success]:</p> <ol style="list-style-type: none"> 1. Maintain percent foliar cover of weed species within reclamation sites at a level equal to or less-than the paired control site. This will reduce the risk of invasive weeds outcompeting favorable vegetation and creating a source population for dispersing weed species. 2. Reclamation actions should prioritize establishment of native perennial bunchgrasses. Native, perennial bunchgrasses are our best defense against fire-prone annual grasses that threaten the arid habitats crossed by this project. Maintain $\geq 70\%$ percent foliar cover of native perennial bunchgrasses of the paired control site. The remaining percentage of vegetation can be other desirable vegetation species not present at the control site or functional bare ground.

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
			3. Reclamation actions in forested and shrub habitats should have appropriate woody species in the plant mix. Woody species should be plugged using appropriate aged plants to ensure the greatest possible revegetation success. Successful revegetation of sagebrush habitats should have at least 15 percent sagebrush foliar cover. 4. Maturity of vegetation within paired control sites should be used to determine the reclamation monitoring timeframe. Monitoring should be conducted on a regular 1-2 year interval until vegetation is established in a similar species composition as the paired control site. Monitoring efforts should then be extended to every 5-10 years (depending on habitat vegetation) until the vegetation reaches the same maturity as the paired control site when the Project impact occurred.
P1-3 Reclamation and Revegetation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 29; Section 6.5 Adaptive Management and Site Release	ODFW does not support the concept of waivers in the event of revegetation failure because that equates to permanent impact without offset, and the mitigation policy calls for no net loss. In the event of reclamation failure, despite remedial efforts, temporary impacts to wildlife habitat become permanent impacts. In these cases, the difference in compensatory mitigation offsets should be addressed (for example, if temporary impacts were mitigated at a 0.5:1 rate, the now permanent impacts would need to be mitigated at a 1:1 (or higher) rate). To account for such cases, ODFW recommends compensatory mitigation also be listed as a potential adaptive management option in the reclamation plan.

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
P1-5 Noxious Weed Plan	OAR 635-022-0060; OAR 635-415-0025	Page 26; Section 6.1 Monitoring	<p>Linear projects such as transmission lines and pipelines, often inadvertently spread noxious weeds across the landscape. This is perhaps the greatest risk of this project to Oregon’s wildlife habitats. For this reason, ODFW believes noxious weed monitoring and control is an extremely important minimization measure (per OAR 635-415). IPC is proposing noxious weed monitoring only for the first 5 years of the project, post-construction. If control efforts are not successful, IPC will consult with ODOE on next steps and may request a ‘waiver’. ODFW contends that noxious weed monitoring and control ought to be the obligation of the applicant for the life of the project impact, for if this project led to noxious weed expansion, that could be interpreted as an expansion of project footprint. If the project’s footprint were to expand over time, the areal extent of the project impact would need to be recalculated and could impact the compensatory mitigation quantities.</p> <p>Long-term monitoring and successful treatment of weeds are important to the success of habitat restoration efforts and for habitat health. ODFW recommends that IPC monitor and control invasive weeds beyond the initial 5-year treatment period on a regular schedule of every 7 –10 years for the life of the Project. Treatment should occur when IPC has identified established weeds at a rate higher than pre-Project conditions. The Department recommends IPC work collaboratively with ODOE and the Department to define an appropriate monitoring schedule.</p>

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
P1-6 Fish and Wildlife Habitat Mitigation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 15; Section 3.3.2; Table 9. Accounting for Mitigation Debit for Permanent Direct Impacts, Category 2	IPC proposes to mitigate for permanent direct impacts in Category 2 habitat at the rate of >1 acre offset per 1 acre of impact (>1:1). The ODFW Fish and Wildlife Habitat Mitigation Policy sets forth a goal for Category 2 habitats of no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality. While the proposed rate of >1:1 technically meets the 'no net loss' of quantity, if the rate tends closer to 1 (for example 1.1:1, as opposed to 2:1) it does not leave much of a 'buffer' to achieve no net loss of quality, and even more difficult to achieve net gain in quality. A larger ratio creates a buffer to safeguard against failure of the habitat restoration/enhancement activities that IPC would be performing as part of their 'net benefit' activity. The narrower the ratio, the more in-depth monitoring ODFW would recommend to ensure that the goals of no net loss in quantity and quality were achieved. This is the reason most project applicants opt for a larger mitigation ratio (such as 2:1) in category 2 habitats, so they can have some portion of the mitigation area that is struggling to provide uplift while still meeting the net benefit goal.
P1-6 Fish and Wildlife Habitat Mitigation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 15; Section 3.3.2; Table 10. Accounting for Mitigation Debit for Temporary Direct Impacts, Category 3 and 4	Similar to the comment provided above, the ratio of <1:1 could meet the policy but if the rate of mitigation is 0.1:1 it will be unlikely that IPC can meet the goals of the policy with regard to temporal loss. If the rate of mitigation is closer to 0.5:1 or 0.9:1 it becomes more obvious that temporal habitat loss will be adequately addressed.
P2	OAR 635-140-0000 - 0025	P2-12 / Section 3.6 Baseline Surveys	Due to changes in sage-grouse abundance and habitat use over time, sage-grouse lek survey data has a 10-year shelf-life. Before construction and calculation of

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
			mitigation responsibility, the project proponent should resurvey areas for sage-grouse leks where previous surveys were conducted 10 or more years prior to construction. This resurvey effort should be minimal because ODFW and BLM have significantly increased survey efforts for sage-grouse leks and the project proponent will only be requested to survey areas that have been surveyed within 10 years prior to project construction. The project proponent must coordinate with ODFW to determine where resurveys should be conducted.
P2	OAR 635-140-0000 - 0025	P2-17 / Fish and Wildlife Condition 25:	Condition 25 indicates that mitigation for project impacts to sage-grouse and their habitats will not be calculated or provided until the 3 rd year of operation in order to incorporate final analysis of indirect impacts from project roads. Postponing mitigation from initial project construction impacts through year 3 of project operation will result in a detrimental temporal loss of sage-grouse habitat. This several-year loss of sage-grouse habitat does not meet OAR 635-140-0010 and 635-140-0025. To comply with these policies, ODFW proposes that the project proponent reduce prolonged loss of sage-grouse habitat by calculating and providing mitigation for sage-grouse in a 2 stage process. First, the project proponent should fully mitigate, as outlined in OAR 635-140-0025(3), for areas of known, direct (towers, roads, pulling & tensioning area, etc.) and indirect project impacts (excluding roads) prior to construction. Second, upon completion of the traffic study in year 3 of operation, the project proponent should provide mitigation for any remaining indirect impacts to sage-grouse habitat identified from the project road analysis. Mitigation for indirect road impacts should be established immediately after finalizing the road analysis. Mitigation will be calculated using the ODFW Habitat Quantification Tool (HQT), and can be completed through permittee-responsible offsite mitigation or payment into ODFW's In-Lieu Fee program.
P2	OAR 635-140-0000 - 0025	P2-22 / Table P2-6	ODFW recommends Table P2-6 identify the need for compensatory mitigation for permanent indirect impacts from project access roads. Roads can have long lasting indirect impacts on sage-grouse habitat as vehicle traffic results in auditory impacts

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
			and human presence can interfere with sage-grouse use of habitat adjacent to roads. ODFW will request compensatory mitigation for new project roads or existing roads with increased traffic rates if access control cannot be implemented. ODFW will use the HQT to calculate a mitigation responsibility and assimilate any minimization measure proposed by the project proponent. Use this information to update relevant sections such as on page P2-23.
P2	OAR 635-140-0000 - 0025	P2-24 / Table P2-7	Table P2-7 describes temporary indirect impacts to sage-grouse habitat from access roads and invasive plant species. ODFW requests that the project proponent also address temporary indirect impacts that will be generated from the construction of the transmission line, associated ancillary features, and use of any multi-use or fly yards within sage-grouse habitat.
P2	OAR 635-140-0000 - 0025	P2-27 / Third paragraph	ODFW requests the project proponent coordinate design and execution of the project road traffic analysis to ensure state considerations are met.
P3	OAR 635-022-0060; OAR 635-415-0025	Fish and Wildlife Condition 27	ODFW recommends that IPC provide confirmation of access control on relevant facility access roads, and that the access control be included in monitoring/reporting so as to ensure that disturbance to elk populations are minimized.
P3	OAR 635-022-0060; OAR 635-415-0025	Monitoring	ODFW recommends IPC develop a plan for deploying counters in collaboration with ODFW to ensure the goals of the monitoring are met. It would be helpful for this plan to identify which category roads will be monitored, where, how many, etc.
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Section 3.2 Methods, Washington ground squirrel	It is ODFW's understanding that the majority of the proposed project has not yet been surveyed for Washington grounds squirrels (WAGS) due to limitations of access. Given the last date of survey (2014), ODFW notes that all WAGS areas will need to be re-surveyed because we are beyond the standard three-year shelf life for those survey data. Upon further review of the survey methods for WAGS, ODFW realized that previous survey was not in line with our recommended standard survey methodology. ODFW

Oregon Department of Energy

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife			
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language
			apologizes for not recognizing this sooner. IPC's analysis area consists of the Right-of-Way plus a ½ mile buffer to provide flexibility in potential ground disturbance for roads, laydown sites, or other ground-disturbance purposes. The WAGS survey extended out an additional 785 feet beyond the ½ mile buffer. ODFW did not correct this distance in its previous reviews, however, the standard methodology recommends survey out an additional 1000 feet beyond areas of potential ground disturbance. ODFW recommends that future WAGS surveys include this additional 215 feet.
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Page Q-21; Impacts to Washington Ground Squirrel habitat	In the first paragraph on page Q-21, IPC discusses potential impacts to habitats occupied by WAGS. Mid-paragraph IPC states "temporary impacts to category 2 WAGS habitat in agricultural areas will likely be short-term...". It is not clear if IPC then included active agricultural areas in its calculation of impacts, however, ODFW does not consider active agricultural areas to be WAGS habitat because the ground disturbance precludes occupancy.
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Page Q-75; Washington Ground Squirrel Monitoring	To be consistent with ODFW recommendations on other EFSC projects with potential impacts to WAGS, ODFW recommends long-term monitoring of active colonies. The purpose of this long-term monitoring is to assess adequacy of the 785-foot buffer and to monitor for any potential drift in colony extent that may require some additional avoidance measures in the O&M phase of the project to avoid potential take of WAGS. ODFW recommends surveys of existing, active colonies plus an additional 500 feet. Frequency would be years 1, 3, 5, and then at 5-year intervals for the life of the project with reporting to ODFW and ODOE.

B2HAPPDoc13-22 ASC Reviewing Agency Comment ODF_Fields 2019-02-04

TARDAEWETHER Kellen * ODOE

From: FIELDS Tom * ODF
Sent: Monday, February 4, 2019 4:34 PM
To: TARDAEWETHER Kellen * ODOE
Cc: BONEBRAKE Jeff C * ODF; TOKARCZYK John A * ODF; FIELDS Tom * ODF
Subject: RE: Follow up Call with ODF-ODOE per B2H

Hi Kellen.

Rather than taking up time during tomorrow's call, I thought that I would provide you with a few items that need to be updated within the proposal. I still plan on being on the phone.

Exhibit K, Attachment K-2

4.1.5 Fire Protection during Logging Operations

Forest fire control rules are included in OAR 629. All logging operations shall be required to comply with these regulations, with recognition of the limitations of the specific wildfire hazard zone (OAR 629-044-0020).

This OAR does not relate to industrial operations. I believe they are referring to "Regulated Use Zones", which are not identified in OAR or ORS.

Fire Prevention and Suppression Plan

1.3 Responsibilities and Coordination

In paragraph 3, remove ***"Fire risk is anticipated to be low during Project operations"***

There is no way of predicting what the fire risk will be. The rest of the statement referring to fire prevention and suppression measures is accurate.

2.1 Preconstruction and Construction

Update "ODF's Fire Prevention Rules, OAR Chapter 629, Division 43 (ODF 2015) to (ODF 2017)....when rule changes occurred.

2.1.5 Equipment

Typo - 8-pound capacity should be 8-ounce capacity.

Update pump requirement to 2017 language.

The pump will discharge not less than 20 gallons per minute at a pressure of at least 115 pounds per square inch at pump level;

Hose and nozzle: A nozzle, and enough serviceable hose of not less than 3/4 inch inside diameter, to reach from the water supply to any location in the operation area affected by power driven machinery, or 500 feet, whichever is greater.

Typo – Each power saw must have an 8-ounce fire extinguisher and a round pointed shovel...

Update "Watchman" in accordance with 2017 OAR's. (Now Firewatch with new language).

The firewatch must constantly observe the operation area during any breaks (up to three hours) in operation activity and for three hours after the power driven machinery used by the operator has been shut down for the day; visually observe all portions of the operation area on which operation activity occurred during the preceding period of activity; and be qualified in the use and operation of assigned firefighting equipment and tools; be physically capable of performing assigned fire suppression activities; and be advised of single employee assignment responsibilities (OAR 437-007-1315), when working alone. Each person providing fire watch service on an operation area must have adequate facilities for transportation and communication to be able to summon firefighting assistance in a timely

manner. Upon discovery of a fire, fire watch personnel must first report the fire, summon any necessary firefighting assistance, describe intended fire suppression activities and agree on a checking system; then after determining a safety zone and an escape route that will not be cut off if the fire increases or changes direction, immediately proceed to control and extinguish the fire, consistent with firefighting training and safety.

2.2 Restricted Operations

2nd Paragraph. Change “During periods of high fire danger” to “*During fire season...*”

Thanks,

Tom

Tom Fields

Fire Prevention Coordinator
Oregon Department of Forestry
2600 State Street
Salem, Oregon 97310
(503) 945-7440 (desk)
(503) 983-8897 (cell)
[Prevention on the Web](#)

-----Original Appointment-----

From: FIELDS Tom * ODF

Sent: Tuesday, January 22, 2019 2:44 PM

To: TARDAEWETHER Kellen * ODOE

Subject: Accepted: Follow up Call with ODF-ODOE per B2H

When: Tuesday, February 05, 2019 10:00 AM-11:00 AM (UTC-08:00) Pacific Time (US & Canada).

Where: ODOE Room Hermiston * ODOE

B2HAPPDoc13-23 ASC Reviewing Agency Comment ODF_Fields 2019-02-19



Oregon

Kate Brown, Governor

Department of Forestry

State Forester's Office
2600 State Street
Salem, OR 97310-1336
503-945-7200
FAX 503-945-7212
www.oregon.gov/ODF

February 19, 2019



"STEWARDSHIP IN FORESTRY"

From: Tom Fields
Fire Prevention Coordinator
Oregon Department of Forestry

To: Oregon Department of Energy
Re: Boardman to Hemmingway Powerline Construction Project

The Oregon Department of Forestry (ODF) has reviewed the application for site certificate from Idaho Power Company to the Oregon Department of Energy to construct, operate and maintain a high-voltage electric transmission line between Boardman, Oregon and the Hemingway Substation in southwest Idaho as an extension of IPC's electric transmission system.

The proposal includes provisions for meeting requirements under the Oregon Forest Practices Act and other laws and rules pertaining to fire prevention and suppression measures regarding industrial operations on private and public lands within ODF's protection boundaries. Additionally, the proposal details further expectations relating to ongoing and future maintenance upon establishment of the transmission line.

Upon review, ODF finds that fire prevention measures and vegetation management objectives are consistent with current policies, laws and rules under Oregon Revised Statute Chapters 477 (Fire Protection of Forests and Vegetation) and 527 (Forest Practices) and Oregon Administrative Rules Chapter 629 (Department of Forestry) as they relate to proposed operations with the following stipulations.

- 1) Update language in the Fire Prevention and Suppression Plan to be consistent with current administrative rules for fire prevention. This includes requirements for water supply and equipment for fire suppression under OAR 629-043-0020 and requirements for Firewatch under OAR 629-043-0030.
- 2) Remove language in the Fire Prevention and Suppression Plan section 1.3 inferencing that "fire danger is anticipated to be low during Project operations..." as the level of fire danger is difficult to predict prior to the Project.
- 3) Replace "During periods of high fire danger..." language in the Fire Prevention and Suppression Plan section 2.2 with "During fire season..."
- 4) In Attachment K-2, Right-of-Way Clearing Assessment, replace "wildfire hazard zones (OAR 629-044-0200)" with "regulated use zones," as wildfire hazard zones do not correlate with industrial fire prevention rules.

This letter of review in no way removes potential liability in the event of a wildfire. Should the project operation be out of compliance with any fire prevention and suppression requirements, the responsible

party is subject to full liability and all fire suppression costs. Liability is limited to \$300,000 in fire suppression costs if the operation was in full compliance.

Sincerely,

Tom Fields

B2HAPPDoc13-23 ASC Reviewing Agency Comment ODF Fields 2019-02-19



Oregon

Kate Brown, Governor



3040 25th Street, SE
Salem, OR 97302-1125
Phone: (503) 378-4880
Toll Free: (800) 874-0102
FAX: (503) 373-1688

March 7, 2019

Kellen Tardaewether
Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301

Re: Boardman to Hemingway – ODA Comments

Dear Ms. Tardaewether:

The Oregon Department of Aviation (ODA) appreciates the opportunity to review and comment on the Boardman to Hemingway Transmission Line. According to the preliminary site plan the transmission line will be within 5 miles of two public use airports (i.e., La Grande/Union County and Baker City Municipal). In accordance with ORS 836.535(2)(b) – Hazards to Air Navigation; OAR 738-070-0010(2)(a-c) and (6) (General Information); OAR 738-070-0110(1)(b) – Standards for Determining Obstructions; the ODA would like to submit the following comments and proposed conditions of approval.

ODA would request to the following Conditions of Approval apply to all new structures or power lines within 5 nautical miles of the La Grande / Union County Airport and Baker City Airport.

- The applicant must file and receive a determination from the Oregon Department of Aviation as required by OAR 738-070-0060 on **FAA Form 7460-1** Notice of Proposed Construction or Alteration to determine if any structures or power lines will pose a hazard to aviation safety to the **La Grande / Union County Airport** and **Baker City Airport**. A subsequent submittal may be required by the FAA due to its location to the La Grande / Union County Airport and Baker City Airport, to ensure Federal Grant Assurances.
- The height of the new structures or power lines should not penetrate FAA Part 77 Imaginary Surfaces, as determined by ODA and the FAA.
- Marking Lights, per FAA AC 70/7460-1L, may be needed to identify to structures or power lines.
- Coordination with the La Grande / Union County Airport may be needed to issue a NOTAM during any construction near the airport.
- All proposed helipads / personal use / private use airport will need to comply with ORS 836.630.

ODA appreciates the opportunity to comment on this application. The Department requests to be identified as a party of record for any future land use application.

If you have any questions or need further information or clarification on the comments, please feel free to contact me at 503-378-2529 or Jeff.Caines@aviation.state.or.us.

Sincerely

Jeff Caines, AICP
Aviation Planner
Oregon Department of Aviation

B2HAPPDoc13-25 ASC Reviewing Agency Comment DSL_61621 RF Authorization

Dep
2019-04-01
775 Summer Street, Suite 100
Salem, OR 97301-1279
☎ 503-986-5200

Permit Type:	Removal/Fill
Waterway:	Many various wetlands/waters
County:	Morrow, Umatilla, Union, Baker, Malheur
Expiration Date:	(To be determined when the permit is issued.)

Idaho Power Company

IS AUTHORIZED IN ACCORDANCE WITH ORS 196.800 TO 196.990 TO PERFORM THE OPERATIONS DESCRIBED IN THE REFERENCED APPLICATION, SUBJECT TO THE SPECIAL CONDITIONS LISTED ON ATTACHMENT A AND TO THE FOLLOWING GENERAL CONDITIONS:

1. This permit does not authorize trespass on the lands of others. The permit holder must obtain all necessary access permits or rights-of-way before entering lands owned by another.
2. This permit does not authorize any work that is not in compliance with local zoning or other local, state, or federal regulation pertaining to the operations authorized by this permit. The permit holder is responsible for obtaining the necessary approvals and permits before proceeding under this permit.
3. All work done under this permit must comply with Oregon Administrative Rules, Chapter 340; Standards of Quality for Public Waters of Oregon. Specific water quality provisions for this project are set forth on Attachment A.
4. Violations of the terms and conditions of this permit are subject to administrative and/or legal action, which may result in revocation of the permit or damages. The permit holder is responsible for the activities of all contractors or other operators involved in work done at the site or under this permit.
5. Employees of the Department of State Lands (DSL) and all duly authorized representatives of the Director must be permitted access to the project area at all reasonable times for the purpose of inspecting work performed under this permit.
6. In issuing this permit, DSL makes no representation regarding the quality or adequacy of the permitted project design, materials, construction, or maintenance, except to approve the project's design and materials, as set forth in the permit application, as satisfying the resource protection, scenic, safety, recreation, and public access requirements of ORS Chapters 196, 390, and related administrative rules.
7. Permittee must defend and hold harmless the State of Oregon, and its officers, agents and employees from any claim, suit, or action for property damage or personal injury or death arising out of the design, material, construction, or maintenance of the permitted improvements.
8. Authorization from the U.S. Army Corps of Engineers may also be required.

NOTICE: If removal is from state-owned submerged and submersible land, the permittee must comply with leasing and royalty provisions of ORS 274.530. If the project involves creation of new lands by filling on state-owned submerged or submersible lands, you must comply with ORS 274.905 to 274.940 if you want a transfer of title; public rights to such filled lands are not extinguished by issuance of this permit. This permit does not relieve the permittee of an obligation to secure appropriate leases from DSL, to conduct activities on state-owned submerged or submersible lands. Failure to comply with these requirements may result in civil or criminal liability. For more information about these requirements, please contact Department of State Lands, 503-986-5200.

Kirk Jarvie, Southern Operations Manager
Aquatic Resource Management
Oregon Department of State Lands

Authorized Signature

ATTACHMENT A

Permit Holder: Idaho Power Company

Project Name: Boardman to Hemmingway Transmission Line Project (B2H)

Special Conditions for Removal/Fill Permit No. 61621-RF

READ AND BECOME FAMILIAR WITH CONDITIONS OF YOUR PERMIT.

The project site may be inspected by the Department of State Lands (DSL) as part of our monitoring program. A copy of this permit must be available at the work site whenever authorized operations are being conducted.

1. **Responsible Party:** By signature on the application, Dave Wymond is acting as the representative of Idaho Power Company (IPC). By proceeding under this permit, Idaho Power Company agrees to comply with and fulfill all terms and conditions of this permit, unless the permit is officially transferred to another party as approved by the Energy Facility Siting Council (EFSC) in consultation with DSL.

2. **Authorization to Conduct Removal and/or Fill:** This permit authorizes removal and fill of material in various locations in Morrow, Umatilla, Union, Baker and Malheur counties as referenced in the Application for Site Certificate (ASC), Exhibit J, Tables C1A and C2A, maps (Appendices C1-C165), with a final date of September 2018 and summarized as follows:

Summary of Authorized Wetland Impacts

Wetland #	Permanent			Temporary		
	Acres	Removal (cy)	Fill (cy)	Acres	Removal (cy)	Fill (cy)
See ASC, Exhibit J, Table O-1A	0.211	545	576	0.386	622	622
Total:	0.211	545	576	0.386	622	622

Summary of Authorized Waterway Impacts

Waterway Name	Permanent			Temporary		
	Linear Ft. /Acres	Removal (cy)	Fill (cy)	Linear Ft. /Acres	Removal (cy)	Fill (cy)
See ASC, Exhibit J, Table O-2A	526/0.071	129	88	887/0.125	206	206
Total:	526/0.071	129	88	887/0.125	206	206

This permit also authorizes removal and fill activities necessary to complete the required compensatory mitigation. In the event information in the application conflicts with these permit conditions, the permit conditions prevail. See ASC, Exhibit J, JPA, Compensatory Mitigation Plan Figure 1 for project location.

3. **Impacts to Areas Where Access has not been Granted (Data-Gap):** This permit allows for removal and fill impacts only within wetlands and other waters of the state that the applicant has had access to, had a delineation and received a concurrence from the Department. When permission to enter the Data-Gap areas is received, an updated wetland delineation will be

Attachment A
61621-RF
Page 3 of 12

provided to the Department for review. After receipt of a concurrence from the Department, and after review of a revised removal-fill permit application with updated impacts, EFSC, in consultation with DSL, will make a permit decision regarding the additional impacts.

4. **Work Period in Jurisdictional Areas:** Fill or removal activities below the ordinary high water elevation of waterways listed in ASC, Exhibit J, Table O-2A must be conducted during the Oregon Department of Fish and Wildlife (ODFW) recommended in-water -work periods, unless otherwise coordinated with ODFW and approved in writing by ODOE and DSL. If fish eggs are observed within the project area, work must cease, and DSL contacted immediately.
5. **Changes to the Project or Inconsistent Requirements from Other Permits:** It is the permittee's responsibility to ensure that all state, federal and local permits are consistent and compatible with the final approved project plans and the project as executed. Any changes made in project design, implementation or operating conditions to comply with conditions imposed by other permits resulting in removal-fill activity must be approved by EFSC in consultation with DSL prior to implementation.
6. **DSL May Halt or Modify:** DSL retains the authority to temporarily halt or modify the project or require rectification in case of unforeseen adverse effects to aquatic resources or permit non-compliance.
7. **DSL May Modify Conditions Upon Permit Renewal:** EFSC, in consultation with DSL retains the authority to modify conditions upon renewal, as appropriate, pursuant to the applicable rules in effect at the time of the request for renewal or to protect waters of this state.

Pre-Construction

8. **Stormwater Management Approval Required Before Beginning Work:** Prior to the start of construction, the permittee must obtain a National Pollution Discharge Elimination System (NPDES) permit from the Oregon Department of Environmental Quality (DEQ), if one is required by DEQ.
9. **Authorization to Use Property for Linear Projects:** For linear facility projects, the removal-fill activity cannot occur until the person obtains:
 - a. The landowner's consent;
 - b. A right, title or interest with respect to the property, that is sufficient to undertake the removal or fill activity; or
 - c. A court order or judgment authorizing the use of the property
10. **Pre-construction Resource Area Fencing or Flagging:** Prior to any site grading, the boundaries of the avoided wetlands, waterways, and riparian areas adjacent to the project site must be surrounded by noticeable construction fencing or flagging. The marked areas must be maintained during construction of the project and be removed immediately upon project completion.

General Construction Conditions

11. **Water Quality Certification:** The Department of Environmental Quality (DEQ) may evaluate this project for a Clean Water Act Section 401 Water Quality Certification (WQC). If the evaluation

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results in issuance of a Section 401 WQC, that turbidity condition will govern any allowable turbidity exceedance and monitoring requirements.

12. **Erosion Control Methods:** The following erosion control measures (and others as appropriate) must be installed prior to construction and maintained during and after construction as appropriate, to prevent erosion and minimize movement of soil into waters of this state.
- a. All exposed soils must be stabilized during and after construction to prevent erosion and sedimentation.
 - b. Filter bags, sediment fences, sediment traps or catch basins, leave strips or berms, or other measures must be used to prevent movement of soil into waterways and wetlands.
 - c. To prevent erosion, use of compost berms, impervious materials or other equally effective methods, must be used to protect soil stockpiled during rain events or when the stockpile site is not moved or reshaped for more than 48 hours.
 - d. Unless part of the authorized permanent fill, all construction access points through, and staging areas in, riparian and wetland areas must use removable pads or mats to prevent soil compaction. However, in some wetland areas under dry summer conditions, this requirement may be waived upon approval by DSL. At project completion, disturbed areas with soil exposed by construction activities must be stabilized by mulching and native vegetative plantings/seeding. Sterile grass may be used instead of native vegetation for temporary sediment control. If soils are to remain exposed more than seven days after completion of the work, they must be covered with erosion control pads, mats or similar erosion control devices until vegetative stabilization is installed.
 - e. Where vegetation is used for erosion control on slopes steeper than 2:1, a tackified seed mulch must be used so the seed does not wash away before germination and rooting.
 - f. Dredged or other excavated material must be placed on upland areas having stable slopes and must be prevented from eroding back into waterways and wetlands.
 - g. Erosion control measures must be inspected and maintained as necessary to ensure their continued effectiveness until soils become stabilized.
 - h. All erosion control structures must be removed when the project is complete, and soils are stabilized and vegetated.
13. **Hazardous, Toxic, and Waste Material Handling:** Petroleum products, chemicals, fresh cement, sandblasted material and chipped paint, wood treated with leachable preservatives or other deleterious waste materials must not be allowed to enter waters of this state. Machinery refueling is to occur at least 150 feet from waters of this state and confined in a designated area to prevent spillage into waters of this state. Barges must have containment system to effectively prevent petroleum products or other deleterious material from entering waters of this state. Project-related spills into waters of this state or onto land with a potential to enter waters of this state must be reported to the Oregon Emergency Response System (OERS) at 1-800-452-0311.
14. **Archaeological Resources:** If any archaeological resources, artifacts or human remains are encountered during construction, all construction activity must immediately cease. The State Historic Preservation Office must be contacted at 503-986-0674. You may be contacted by a Tribal representative if it is determined by an affected Tribe that the project could affect Tribal cultural or archeological resources.
15. **Construction Corridor:** There must be no removal of vegetation or heavy equipment operating or traversing outside the designated construction corridor or footprint (Appendices C1-C165).

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16. **Hazards to Recreation, Navigation or Fishing:** The activity must be timed so as not to unreasonably interfere with or create a hazard to recreational or commercial navigation or fishing.
17. **Operation of Equipment in the Water:** Heavy equipment may be positioned on or traverse the area below ordinary high water only when the area is free of flowing or standing water or if the area is isolated from the waterway and aquatic organism salvage is completed, as described in the application. All machinery operated below ordinary high water (OHW) elevation must use vegetable-based hydraulic fluids, be steam cleaned and inspected for leaks prior to each use, and be diapered to prevent leakage of fuels, oils, or other fluids below OHW elevation. Any equipment found to be leaking fluids must be immediately removed from and kept out of OHW until repaired. Equipment staging, cleaning, maintenance, refueling, and fuel storage must be at least 150 feet from OHW and wetlands to prevent contaminants from entering waters of the state.
18. **Work Area Isolation:** Within perennial streams or when water is present in intermittent streams, the work area must be isolated from the water during construction by using a coffer dam or similar structure in accordance with the work area isolation plan in the application. All structures and materials used to isolate the work area must be removed immediately following construction and water flow returned to pre-construction conditions.
19. **Fish Salvage Required:** Fish must be salvaged from the isolation area. Permits from NOAA Fisheries and Oregon Department of Fish and Wildlife, Fish Research are required to salvage fish. Fish salvage permit information may be obtained by contacting ODFW Fish Research at 503-947-6254 or Fish.Research@state.or.us.
20. **Fish Passage Required:** The project must meet Oregon Department of Fish and Wildlife requirements for fish passage.
21. **Raising or Redirecting Water:** The project must not cause water to rise or be redirected and result in damage to structures or property on the project site as well as adjacent, nearby, upstream, and downstream of the project site.
22. **Temporary Ground Disturbances:** All temporarily disturbed areas must be returned to original ground contours at project completion.

Riprap Placement

23. **Riprap Placement Methods:** Riprap/rock must be placed under the following conditions:
 - a. Only clean, erosion resistant rock from an upland source must be used as riprap. No broken concrete or asphalt must be used.
 - b. Riprap rock must be placed in a manner that does not increase the upland surface area.
 - c. Riprap must be placed in a way as to minimize impacts to the active stream channel.
 - d. Gravel or filter fabric should be placed behind the riprap rock, including the toe trench rock, as a filter blanket.
 - e. All riprap rock must be placed, not dumped, from above the bank line.

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24. Riprap Must Be Covered: Riprap above ordinary high water elevation must be covered and the voids filled with soil, gravel, and / or mulch sufficient to allow the performance standards to be achieved and wildlife to move across it naturally.

Rectification of Temporary Impacts

25. Site Rectification Required for Temporary Wetland Impacts: Site rectification for temporary impacts to 0.386 acre of wetland and 887 linear feet of other waters must be conducted according to the Site Rehabilitation Plan in the application. Failure to rectify the site may result in additional compensatory mitigation.

26. Pre-construction Elevations Must Be Restored Within the Same Construction Season: Construction activities within areas identified as temporary impact must not exceed two construction seasons and rectification of temporary impacts must be completed within 24 months of the initiation of impacts. However, if the temporary impact only requires one construction season, re-establishment of pre-construction contours must be completed within that same construction season, before the onset of fall rains.

27. Woody Vegetation Planting Required: Planting of native woody vegetation must be completed before the next growing season after re-establishment of the pre-construction contours.

28. Rectification Monitoring Report(s) Required: A post-construction rectification report demonstrating as-built conditions and discussing any variation from the approved plan must be provided to DSL and ODOE within 90 days of revegetation. The post-construction rectification report must include:

- a. Photos from fixed photo points. This should clearly show the site conditions.
- b. A narrative that describes any deviation from the approved rectification plan.

Compensatory Mitigation

The following conditions apply to the actions proposed in the final compensatory mitigation plan, dated September, 2018.

29. Acreage and Type: Mitigation must be conducted according to the minimum acreages and methods described in the table below.

Summary of Wetland Mitigation

Acres	Credits	Cowardin, HGM Class	Method
2.5	1.67	riverine flow-through, Palustrine Emergent (PEM)	creation
1.69	1.13	riverine flow-through, Palustrine Scrub-shrub (PSS)	creation
0.57	0.38	riverine flow-through, Palustrine Forested (PFO)	creation
1.45	0.48	riverine flow-through, Palustrine Emergent (PEM)	enhancement
6.21	3.66	Wetland Mitigation Totals	

Summary of Waterway Mitigation

Linear Feet	Action	Method

432		In water structure placement	enhancement
1080		Riparian planting	enhancement
810		New channel construction	creation
1322		Waterway Total	

30. **Mitigation Site Location:** The mitigation must be conducted off-site. The center-point of the mitigation site is 45.3775 degrees Latitude, -117.8878 degrees Longitude. The current legal description is Township 2 South, Range 40 East, Section 19CB, in Tax Lot 3200. as shown on ASC, Exhibit J, JPA, Compensatory Wetland Mitigation Plan, Figure 1.
31. **Timing of Mitigation Site Grading:** Mitigation site grading must be completed prior to or within the same construction season as the commencement of the wetland impacts.
32. **Signs Required:** Signs must be posted along the mitigation site perimeter stating that the area behind the sign is a protected site.
33. **Long-term Protection of the Mitigation Site - Deed Restriction:** The mitigation site must be protected in perpetuity by recording the approved Declaration of Covenants and Restrictions and Access Easement (Protection Instrument) on the deed of the property. The protection instrument must be approved and signed by DSL prior to recording with Union County. A copy of the recorded instrument must be sent to DSL and ODOE with the post-construction report.
34. **Long-term Protection of the Mitigation Site - Conservation Easement:** The mitigation site must be protected in perpetuity by conveying an approved Conservation Easement to Grande Ronde Model Watershed or another non-profit or non-governmental organization. The protection instrument must be approved and signed by DSL prior to recording with Union County. A copy of the recorded easement must be sent to DSL and ODOE with the post-construction report.
35. **GIS Data:** A georeferenced shapefile (.shp) must be submitted to DSL prior to mitigation site release that documents the spatial extent of the mitigation site(s), including buffers. The shapefile must conform to the Oregon Lambert (Intl. Feet) projection.
36. **Long-term Maintenance Required:** Long-term site maintenance is required as described in the Compensatory Mitigation Plan in the application.

Monitoring and Reporting Requirements

37. **Post-Construction Report Required:** A post-construction report demonstrating as-built conditions and discussing any variation from the approved plan must be provided to DSL and ODOE within 90 days of revegetation. The post-construction report must include:
- c. A scaled drawing, accurate to 1-foot elevation, clearly showing the following:
 - 1. Finished contours of the site.
 - 2. Current tax lot and right-of-way boundaries.
 - 3. Photo point locations.
 - d. Photos from fixed photo points. This should clearly show the site conditions, and any signage, and fencing required.
 - e. A narrative that describes any deviation from the approved mitigation plan.
 - f. A copy of the recorded deed restriction or conservation easement.

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- 38. Annual Monitoring Reports Required:** Monitoring is required until DSL has officially released the site from further monitoring when the site has met all success criteria as determined by DSL. The permittee must monitor the site to determine whether the site is meeting performance standards for a minimum period of 5 growing seasons after completion of all the initial plantings. Annual monitoring reports are required and are due by December 31, with a copy sent to ODOE. Failure to submit the required monitoring report by the due date may result in an extension of the monitoring period, forfeiture of the financial security and/or enforcement action.
- 39. Extension of the Monitoring Period:** The monitoring period may be extended, at the discretion of DSL, for failure of the site to meet performance standards for the final two consecutive years without corrective or remedial actions (such as irrigation, significant weed/invasive plants treatment or replanting) or when needed to evaluate corrective or remedial actions.
- 40. Contents of the Annual Monitoring Report:** The annual monitoring report must include the following information:
- a. Completed Monitoring Report Cover Sheet, which includes permit number, permit holder name, monitoring date, report year, performance standards, and a determination of whether the site is meeting performance standards.
 - b. Site location map(s) that clearly shows the impact site and mitigation site boundaries.
 - c. Site Plan that clearly shows at least the following.
 1. The area seeded, with the square foot area listed.
 2. The area planted with trees and shrubs, with the square foot area listed.
 3. Current tax lot and right-of-way boundaries.
 4. Permanent monitoring plot locations that correspond to the data collected and fixed photo-points. These points should be overlaid on the as-built map.
 5. PEM, PSS, PFO, riparian areas, and buffer clearly identified separately and the area (square foot or acreage) of each noted.
 6. Creation, restoration, enhancement, and preservations areas identified separately, with the area of each listed.
 - d. A brief narrative that describes maintenance activities and recommendations to meet success criteria. This includes when irrigation occurred and when the above ground portion of the irrigation system was or will be removed from the site.
 - e. Data collected to support the conclusions related to the status of the site relative to the performance standards listed in this permit (include summary/analysis in the report and raw data in the appendix). Data should be submitted using the DSL Mitigation Monitoring Vegetation Spreadsheet or presented in a similar format as described in DSL's Routine Monitoring Guidance for Vegetation.
 - f. Photos from fixed photo points (include in the appendix).
 - g. Other information necessary or required to document compliance with the performance standards listed in this permit.
 - h. A post-construction functional assessment by the end of the monitoring period.
- 41. Corrective Action May Be Required:** DSL retains the authority require corrective action in the event the performance standards are not accomplished at any time within the monitoring period.

Performance Standards

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To be deemed successful, the mitigation areas including buffers must meet the following performance standards, as determined by DSL:

42. **Establishment of Permanent Monitoring Locations Required:** Permanent plot locations must be established during the first annual monitoring in sufficient number and locations to be representative of the site. The permanent plot locations must be clearly marked on the ground.
43. **Wetland Acreage Required:** The site will have a minimum acreage as shown in the Acreage and Type table above, as determined by a Wetland Delineation Light with data collected during spring of a year when precipitation has been near normal, vegetation has been established, and irrigation has been removed for at least two years. Acreage must be documented on a printed map and in a GIS shapefile (.shp) including attribute information for each unique wetland polygon identifying the size as well as HGM and Cowardin classes.

Herbaceous Wetlands

44. **Native Species Cover:** The cover of native species, as defined in the USDA Plants Database, in the herbaceous stratum is at least 60%.
45. **Invasive Species Cover:** The cover of invasive species is no more than 10%. A plant species should automatically be labeled as invasive if it appears on the current Oregon Department of Agriculture noxious weed list, plus known problem species including *Phalaris arundinacea*, *Mentha pulegium*, *Holcus lanatus*, *Anthoxanthum odoratum*, and the last crop plant if it is non-native. Non-native plants should be labeled as such if they are listed as non-native on the USDA Plants Database. Beginning in Year 2 of monitoring, DSL will consider a non-native plant species invasive if it comprises more than 15% cover in 10% or more of the sample plots in any habitat class and increases in cover or frequency from the previous monitoring period. Plants that meet this definition will be considered invasive for all successive years of monitoring.
46. **Bare Substrate Cover:** Bare substrate represents no more than 20% cover.
47. **Species Diversity:** By Year 3 and thereafter, there are at least 6 different native species. To qualify, a species must have at least 5% average cover in the habitat class and occur in at least 10% of the plots sampled.
48. **Moisture Prevalence Index:** Prevalence Index is <3.0.

Shrub-dominated and Forested Wetlands

49. **Native Species Cover:** The cover of native species, as defined in the USDA Plants Database, in the herbaceous stratum is at least 60%.
50. **Invasive Species Cover:** The cover of invasive species is no more than 10%. A plant species should automatically be labeled as invasive if it appears on the current Oregon Department of Agriculture noxious weed list, plus known problem species including *Phalaris arundinacea*, *Mentha pulegium*, *Holcus lanatus*, *Anthoxanthum odoratum*, and the last crop plant if it is non-native. Non-native plants should be labeled as such if they are listed as non-native on the USDA Plants Database. Beginning in Year 2 of monitoring, DSL will consider a non-native plant species invasive if it comprises more than 15% cover in 10% or more of the sample plots in any

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habitat class and increases in cover or frequency from the previous monitoring period. Plants that meet this definition will be considered invasive for all successive years of monitoring. After the site has matured to the stage when desirable canopy species reach 50% cover, the cover of invasive understory species may increase but may not exceed 30%.

51. **Bare Substrate Cover:** Bare substrate represents no more than 20% cover.

52. **Woody Vegetation:** The density of woody vegetation is at least 1,600 live native plants (shrubs) and/or stems (trees) per acre OR the cover of native woody vegetation on the site is at least 50%. Native species volunteering on the site may be included, dead plants do not count, and the standard must be achieved for 2 years without irrigation.

53. **Species Diversity:** By Year 3 and thereafter, there are at least 6 different native species. To qualify, a species must have at least 5% average cover in the habitat class and occur in at least 10% of the plots sampled.

54. **Moisture Prevalence Index:** Prevalence Index total for all strata is <3.0.

Riparian Areas

55. **Native Species Cover:** The cover of native species, as defined in the USDA Plants Database, in the herbaceous stratum is at least 60%.

56. **Invasive Species Cover:** The cover of invasive species is no more than 10%. A plant species should automatically be labeled as invasive if it appears on the current Oregon Department of Agriculture noxious weed list, plus known problem species including *Phalaris arundinacea*, *Mentha pulegium*, *Holcus lanatus*, *Anthoxanthum odoratum*, and the last crop plant if it is non-native. Non-native plants should be labeled as such if they are listed as non-native on the USDA Plants Database. Beginning in Year 2 of monitoring, DSL will consider a non-native plant species invasive if it comprises more than 15% cover in 10% or more of the sample plots in any habitat class and increases in cover or frequency from the previous monitoring period. Plants that meet this definition should be considered invasive for all successive years of monitoring. After the site has matured to the stage when desirable canopy species reach 50% cover, the cover of invasive understory species may increase but may not exceed 30%.

57. **Woody Vegetation:** The density of woody vegetation is at least 1,600 live native plants (shrubs) and/or stems (trees) per acre OR the cover of native woody vegetation on the site is at least 50%. Native species volunteering on the site may be included, dead plants do not count, and the standard must be achieved for 2 years without irrigation.

Financial Security

58. **Financial Security Required:** A performance bond (financial security) in the amount of \$15,078 has been provided to DSL to ensure completion of compensatory mitigation in accordance with the conditions of this permit. Failure to keep the performance bond continuously in effect through the date of full performance of all the permit holder's obligations hereunder will constitute a violation and default of this permit by permit holder. If at any time DSL is notified that the performance bond is to be canceled or not renewed, and a replacement financial security is not in place before the termination date, DSL may declare the permit holder to be in breach or

default of its performance obligation under this permit. DSL may claim the full unreleased portion of the penal sum of the financial security, which the holder must pay to DSL with 20 days after delivery of written notice to the holder of such financial security of such breach of default by permit holder.

59. Incremental Release of the Financial Security: The permit holder must file a written request with the agency for release of portions of this financial security. Portions of the financial security may be released at the discretion of DSL, based on the following schedule:

- a. 25% release upon approval of the post-construction report, site protection instrument recorded, and first growing season monitoring report showing site constructed as approved by DSL.
- b. 25% release upon demonstration that the required acreages of wetland have been confirmed by delineation of wetland hydrology and hydrophytic vegetation, and the site is meeting all applicable performance standards after two growing seasons.
- c. 50% release upon approval of the final monitoring report and demonstrated success of the mitigation project based on the performance standards listed in this permit. All performance standards must be met for the final two consecutive years without irrigation, substantial weed or invasive species treatment, or replanting.

Monitoring and Reporting Schedule

Report	Requirements	Schedule	Financial Surety Release Schedule
Post-Construction	Post-construction report Recorded Protection Instrument	90 days after completion of revegetation	
First Annual Report	Establishment of permanent monitoring locations Vegetation performance standards Demonstration that wetland hydrology has been accomplished Evidence that water rights are secured, or are not required	After one growing season of all proposed plantings	25% upon approval of the first annual monitoring report and post-construction report. Site protection instrument recorded.
Second Annual Report	Vegetation performance standards	After two growing seasons	
Third and Fourth Annual Reports	Vegetation performance standards Actual acreage achieved by HGM and Cowardin class ¹ .	After three and four growing seasons, respectively. One "light delineation" should be completed during spring of a year when precipitation has been near normal and no irrigation has been in use during the previous two years	Up to 25% of original amount upon achieving wetland acreage confirmed by delineation of wetland hydrology and wetland vegetation, and meeting all applicable performance standards

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Report	Requirements	Schedule	Financial Surety Release Schedule
Fifth Annual Report (or final report if the monitoring period has been extended)	Vegetation performance standards Functional assessment ^{1,2}	After five growing seasons	Final 50% release upon meeting all performance standards. The performance standards must be met for the final two consecutive years without corrective or remedial actions (such as irrigation, significant weed/invasive plants treatment or replanting)

¹These requirements may be fulfilled any time during the monitoring period but must be received by DSL no later than the fifth annual monitoring.

²Functional assessments must meet the standards and requirements in OAR 141-085-0685. The same assessment method used for the pre-mitigation site functional assessment should be used for monitoring purposes, unless otherwise approved by DSL.

B2HAPPDoc13-27 ASC Reviewing Agency Comment CTUIR_Burke

TARDAEWETHER Kellen * ODOE

From: Teara Farrow Ferman <TearaFarrowFerman@ctuir.org>
Sent: Friday, April 19, 2019 2:38 PM
To: TARDAEWETHER Kellen * ODOE
Cc: Stokes, Mark
Subject: CTUIR's letter regarding B2H mitigation
Attachments: CTUIR letter to ODOE regarding B2H mitigation 4-19-19.pdf

Kellen,

Please find attached the Confederated Tribes of the Umatilla Indian Reservation's letter to ODOE regarding the resolution of our concerns with Idaho Power's proposed B2H project. The letter outlines agreed upon conditions for the site certificate by both the CTUIR and Idaho Power. If you have further questions please contact me.

I will be sending a copy of the letter to the individuals on the copied correspondence list as well via email.

Respectfully,

TEARA FARROW FERMAN

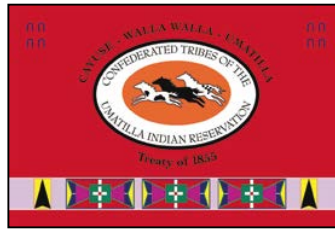
Manager | Cultural Resources Protection Program
Confederated Tribes of the Umatilla Indian Reservation
46411 Timine Way | Pendleton | Oregon 97801
541.276.3447 Office | 541.429.7230 Fax
TearaFarrowFerman@ctuir.org

Assistant General Manager | Átaw Consulting, LLC
A Small Business Enterprise of the CTUIR
46411 Timine Way | Pendleton | Oregon 97801
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TearaFarrowFerman@ctuir.org

The information in this e-mail may be confidential and intended only for the use and protection of the Confederated Tribes of the Umatilla Indian Reservation. If you have received this email in error, please immediately notify me by return e-mail and delete this from your system. If you are not an authorized recipient for this information, then you are prohibited from any review, dissemination, forwarding or copying of this e-mail and its attachments. Thank you.

**Confederated Tribes *of the*
Umatilla Indian Reservation**

Board of Trustees & General Council



46411 Timine Way • Pendleton, OR 97801
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info@ctuir.org • www.umatilla.nsn.us

April 19, 2019

Kellen Tardaewether
Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
550 Capitol Street NE, 1st Floor
Salem, Oregon 97301

Dear Ms. Tardaewether,

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) thanks the Oregon Department of Energy (ODOE) for helping engage the CTUIR and Idaho Power to consult pursuant to the National Historic Preservation Act (NHPA) Section 106, Oregon Revised Statute 469.350, Oregon Administrative Rule 345-015-0180, and Oregon Energy Facility Siting Council (EFSC) Historic, Cultural, and Archaeological Resources standards OAR 345-022-0090 for Idaho Power's proposed Boardman to Hemingway Transmission Line Project (the B2H project).

We understand that the Bureau of Land Management, U.S. Forest Service, the Department of the Navy and other federal agencies are at different phases in their respective permitting processes and thus not all have completed consultation with the CTUIR about the B2H Project. Section 101(d)(6)(B) of the NHPA requires federal agencies, in carrying out their Section 106 responsibilities, to consult with an Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. The B2H Project is a federal undertaking which requires consultation with the CTUIR. Additionally, the Bureau of Land Management, U.S. Forest Service, Bonneville Power Administration, U.S. Army Corps of Engineer, Bureau of Reclamation, Advisory Council on Historic Preservation, Oregon State Historic Preservation Officer, Idaho State Historic Preservation Officer, Washington Department of Archaeology and Historic Preservation, and the CTUIR Tribal Historic Preservation Officer entered into a Programmatic Agreement (PA) for phased compliance with Section 106 of the NHPA. The PA provides for a Historic Properties Management Plan to be developed to address identification and evaluation of historic properties, determinations of specific effects on historic properties, and consultation concerning measures to avoid, minimize, or mitigate any adverse effects prior to the issuance of any notices to proceed by the relevant federal agencies. The CTUIR elected not to sign the PA.

The CTUIR has been in discussions with Idaho Power regarding the B2H Project and we have come to a mutual agreement on the effects the B2H Project may have on historic, cultural, and archaeological resources, NHPA listed, eligible, or likely to be listed historic properties, and historic properties of religious and cultural significance to the CTUIR. The CTUIR is pleased to inform the ODOE and the federal agencies that the CTUIR's concerns have been addressed and will be mitigated by Idaho Power pursuant to a confidential mitigation agreement between the CTUIR and Idaho Power. Therefore, the construction and operation of the proposed B2H project, taking into account mitigation, are not likely to result in significant adverse impacts to eligible or likely eligible historic properties of religious and cultural significance or resources identified by the

CTUIR. Additionally, the CTUIR and Idaho Power have agreed to the following edits (in red) to Idaho Power's proposed condition and request that EFSC include the edited condition in the EFSC site certificate:

Idaho Power's Proposed Historic, Cultural, and Archaeological Resources Condition 2: Prior to construction, the certificate holder shall finalize, and submit to the department for its approval, a final Historic Properties Management Plan and High Probability Areas Assessment. The final Historic Properties Management Plan and High Probability Areas Assessment shall include, or provide for, the following, unless otherwise approved by the department:

- a. The areas that were surveyed for historic, cultural, and archaeological resources;
- b. The location of all facility components and related and supporting facilities;
- c. The areas that will be permanently and temporarily disturbed during construction;
- d. The protective measures described in the draft Historic Properties Management Plan in ASC Exhibit S, Attachment S-9;
- e. The State Historic Preservation Officer's National-Register-of-Historic-Places-eligibility determinations and archaeological resources findings; and
- f. The results of the cultural and historical pedestrian surveys referenced in Historic, Cultural, and Archaeological Resources Condition 1-; and
- g. Before the certificate holder submits the final Historic Properties Management Plan and High Probability Areas Assessment to the department, the certificate holder shall provide the Confederated Tribes of the Umatilla Reservation (CTUIR) the following opportunities to review and comment on the Historic Properties Management Plan and High Probability Areas Assessment:
 - i. When the certificate holder begins to finalize the Historic Properties Management Plan and High Probability Areas Assessment, the certificate holder shall notify the CTUIR that the certificate holder is beginning to finalize the Historic Properties Management Plan and High Probability Areas Assessment and shall request that the CTUIR provide written comments within 60 calendar days from said notice. If requested by the CTUIR, the certificate holder shall reasonably attempt to meet in-person with the CTUIR prior to the 60-day deadline to discuss the Historic Properties Management Plan and High Probability Areas Assessment; however, the timing of the in-person meeting will not affect the CTUIR's obligation to provide comments by the 60-day deadline.
 - ii. The certificate holder shall provide to the CTUIR a copy of the revised Historic Properties Management Plan and revised High Probability Areas Assessment

along with written responses to any CTUIR comments received within the 60-day window set forth above in subsection (g)(i) of this condition. The certificate holder shall request that the CTUIR provide written comments on the revised Historic Properties Management Plan and revised High Probability Areas Assessment within 60 calendar days. If requested by the CTUIR, the certificate holder shall reasonably attempt to meet in-person with the CTUIR prior to the 60-day deadline to discuss the revised Historic Properties Management Plan and revised High Probability Areas Assessment; however, the timing of the in-person meeting will not affect the CTUIR's obligation to provide comments by the 60-day deadline.

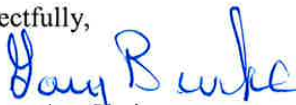
iii. When the certificate holder submits the final Historic Properties Management Plan and High Probability Areas Assessment to the department, the certificate holder shall provide to the CTUIR written responses to any CTUIR comments received within the 60-day window set forth above in subsection (g)(ii) of this condition.

Nothing in this condition shall affect the CTUIR's roles and opportunities as a reviewing agency. The department shall request that the CTUIR, as a reviewing agency, review the final Historic Properties Management Plan and High Probability Areas Assessment submitted by the certificate holder. If the CTUIR has any concerns remaining with the final Historic Properties Management Plan and High Probability Areas Assessment, the CTUIR may raise those concerns with the department at that time.

The mitigation agreement and above condition language fully resolves all concerns and comments identified in previous CTUIR comment letters to ODOE/EFSC. The CTUIR has no further concerns with the proposed B2H Project (including the alternative routes identified in the EFSC application) unless the route of the Project changes, in which case consultation with the CTUIR will be required.

Should you have questions or concerns, please contact Mrs. Teara Farrow Ferman, Manager, Cultural Resources Protection Program, at (541) 276-3447 or tearafarrowferman@ctuir.org.

Respectfully,



Gary Burke, Chairman
Board of Trustees

Cc: Donald Gonzalez, Bureau of Land Management
Tom Montoya, Wallowa Whitman National Forest Supervisor, U.S. Forest Service
F. Lorraine Bodi, Vice President, Environment, Fish and Wildlife, Bonneville Power Administration
Aaron Dorf, Colonel, District Commander, U.S. Army Corps of Engineers
Roland Springer, Area Manager, Bureau of Reclamation
Elizabeth Ellis, Cultural Resources Manager, Department of the Navy

B2HAPPDoc13-28 ASC Reviewing Agency Comment SHPO Case No.
08-2232 Poulev 2019-04-29

TARDAEWETHER Kellen * ODOE

From: POULEY John * OPRD
Sent: Monday, April 29, 2019 3:59 PM
To: TARDAEWETHER Kellen * ODOE
Cc: maxwell.woods@state.or.us; SCHWARTZ Tracy * OPRD
Subject: SHPO Case Nbr SHPO Case No.: 08-2232, Boardman To Hemmingway Transmission Line Project (B2H)
Attachments: SHPO Response Letter Case Nbr SHPO Case No._ 08-2232.pdf

Hi Kellen,
Please find attached our letter for B2H. Tracy and I are available if you have any questions.
Thanks
-John

John Pouley
Assistant State Archaeologist
Oregon SHPO
503-986-0675



Oregon

Kate Brown, Governor

Parks and Recreation Department

State Historic Preservation Office

725 Summer St NE Ste C

Salem, OR 97301-1266

Phone (503) 986-0690

Fax (503) 986-0793

www.oregonheritage.org



April 29, 2019

Ms. Kellen Tardaewether
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301

RE: SHPO Case No. 08-2232

Boardman To Hemmingway Transmission Line Project (B2H)
Construct powerline from Boardman, OR to Hemmingway, ID
multiple sections, Boardman and Murphy, Morrow/ Umatilla/Union/Baker/Malheur County

Dear Ms. Tardaewether:

Oregon SHPO is providing comments to the project referenced above, related to our role in the Energy Facility Siting Council (EFSC) and National Historic Preservation Act (NHPA) processes. The comments include: a summary of the Section 106 (of the NHPA) process for determinations of eligible, not eligible, and unevaluated to the National Register of Historic Places (NRHP); a statement of support for proceeding with EFSC review that includes keeping archaeological sites recommended not eligible by the applicant as "unevaluated"; and those specific to above ground resources.

Section 106 of the National Historic Preservation Act (NHPA) is defined in the implementing regulations (36CFR800) drafted by the Advisory Council on Historic Preservation (ACHP). The process for eligibility determinations is included in 36 CFR 800.4(c). Note: Historic Properties consist of any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the NRHP, including historic properties of religious and cultural significance to an Indian Tribe (HPRCSIT) and Traditional Cultural Properties (TCP). Under 36CFR800.4(c) it states that the Federal agency official shall apply the National Register of Historic Places (NRHP) criteria to properties identified within the Area of Potential Effect (APE) for the undertaking.

Under 36CFR800.4(c)(2), the Federal agency determines whether a property is eligible, or not eligible to the NRHP. If SHPO agrees with the agency determination, the property is eligible or not eligible as applicable. If SHPO does not agree, the Federal agency shall obtain a determination of eligibility from a representative of the Secretary of the Interior. The representative is the Keeper of the NRHP. If a tribe attaches religious and cultural significance to a property that is determined not eligible by the Federal agency, it may ask the ACHP to request the Federal agency to obtain a determination of eligibility.

According to 36CFR800.4(d) the Federal agency must make a finding of effect (No properties affected, or historic properties affected). If there are no historic properties, or historic properties are present but the undertaking will have no effect on them, the Federal agency will provide documentation to SHPO for concurrence. The SHPO has 30 days to object. If the SHPO objects, the Federal agency may either engage in consultation, or forward their finding to the ACHP for review. Eligible properties are entered into SHPO records (GIS-based) as eligible. Not Eligible properties are entered into SHPO records as not eligible. The status remains not eligible until proven otherwise. Not eligible properties have no protections from projects or undertakings and can be damaged, altered, or destroyed without requiring mitigation.

The NRHP is a federal process and the NHPA is federal law. State Historic Preservation Offices (SHPOs) were first defined in the NHPA in 1966, and run the NRHP program at the state level. All SHPOs receive

federal funding to enact these defined roles in both federal processes. To prevent potential confusion, conflicts, and duplication of review from the federally defined role of the SHPO in the NRHP and NHPA processes with its state defined role in the EFSC review, archaeological resources will be addressed as follows: Archaeological sites recommended “not eligible” to the NRHP under EFSC will remain “unevaluated” and treated as eligible in terms of status. Since the EFSC process needs approval prior to completion of the Section 106 process, keeping all recommended “not eligible” archaeological sites as “unevaluated” would meet the cultural standard for the former and allow completion of the latter without contradicting one another.

By treating them as unevaluated at this time, archaeological sites that may be eligible to the NRHP will not be adversely affected and if they are later determined not eligible with concurrence, will not need mitigation, which would satisfy the EFSC standard. Adhering to this process additionally prevents a situation where an archaeological site determined not eligible to the NRHP through the EFSC process, is later determined eligible by the federal agency. Even if SHPO disagrees with the federal agency in their determination, through the Section 106 process, the Advisory Council on Historic Preservation (ACHP) would be called in to review the disagreement at this point, which may result in a finding that the site is eligible, regardless of the view of SHPO. Treating sites as not eligible (unevaluated) at this time both meets the EFSC standard, and allows the federal Section 106 process to run its course without contradicting one another.

Regarding above ground resources, after reviewing the Intensive Level Surveys (ILS) provided to our office we concur with all determinations of eligibility for listing in the NRHP except the following. We cannot concur on the determinations of eligibility for any resources located on federal land until the federal land managing agency consults with our office. These resources should remain unevaluated, but should be treated as eligible. We concur that Huntington likely does not retain sufficient integrity to be eligible as a historic district. However, there may be resources individually eligible for listing in Huntington and that evaluation fell outside of the scope of this survey. That being said, we do not find that there will be any direct or indirect effects to these potentially eligible properties as a result of the proposed undertaking. The site form for 4B2H-EK-47 identifies the property as eligible/contributing under Criterion A for its association with agricultural and irrigation in the western United States. However, other sections of Exhibit S indicate the resource as not eligible/non-contributing. Until this discrepancy is clarified and resolved, the resource should be treated as eligible.

We do not concur with the following segments of Oregon Trail being non-contributing: B2H-UN-005 Whiskey Creek Segment: As noted on the site form, the previous survey on Bureau of Land Management (BLM) property identified possible swales. Without a definitive understanding on their origin, we recommend the segment be considered contributing. We also need additional information to determine if the marker could be contributing to the linear resource to the Oregon Trail or within another context. Survey methodology regarding how the segment was evaluated would also be helpful context to include. How was the four-mile segment surveyed and were available technological resources (like LiDAR) used to verify if ruts still exist? Further, we cannot concur with a determination of eligibility on federal land without consultation from the federal land managing agency; B2H-MA-003 Meek Cutoff: The provided documentation does not properly address the historic significance of the Meek Cutoff. The site form asserts that the Meek Cutoff is not eligible under Criterion A due to a lack of sufficient integrity. However, a property can be significant under any of the four criteria, but may not retain sufficient integrity to convey that significance, therefore rendering it not eligible or non-contributing. Survey methodology regarding how the segment was evaluated would also be helpful context to include, as the documented segment is quite long, though no exact length was provided. We are unsure if and how the entire length of the resource was surveyed for intact integrity, and if available technological resources (like LiDAR) was used to verify if the resource may still be present on the landscape. Until additional information is provided to our office and the National Park Service feasibility is made available to the public, we recommend the segment be treated as contributing to the overall linear resource.

A number of above-ground resources were left unevaluated. Until additional research and documentation is completed, these resources are considered eligible for listing in the NRHP. Any potential direct or indirect impacts should be avoided or mitigated. These resources include: B2H-SA-37 Irrigation Ditch; 4B2H-EK-43 Willow Creek Diversion Canal (Please also note that the property name was not universally corrected from Warm Spring Pump Canal throughout the report and site forms.); 6B2H-MC-07 Clover Creek Valley Homestead; and 4B2H-EK-26 OWR&N Roundhouse and OWR&N/OSL Joint Railyard. Until additional

information is provided on these resources, we should assume these resources are eligible for listing in the National Register. Please remember and consider that it is the policy of the Oregon SHPO to re-survey above-ground historic resources every five (5) years. Also, if another agency, including the BLM, provides additional information to our office we may always reconsider eligibility for any resource.

With regard to direct effects, if all project impacts can be avoided then we concur that the undertaking will result in no significant adverse impact. However, if direct effects cannot be avoided mitigation must be pursued. It is difficult based on the information, maps, and plans provided to determine if direct effects will occur, especially to linear resources located within the Area of Potential Effect. For example, the Union Pacific Railroad (UPRR)-Morrow County (4B2H-EK-04) is located within the direct analysis area and adjacent to the construction footprint. However, it cannot be determined if construction activities will directly affect the historic property based on the information provided. Further, without additional information on the types of infrastructure being proposed (footprint, height, materials, etc.) assessing indirect effects also proves difficult. That being said, and based solely on the information provided at this time, we concur with the Visual Assessment of Historic Properties (VAHP) included in Exhibit S except the following: 6B2H-RP-09 Oregon Trail Segment: The VAHP indicates the Project will "cause partial obstruction," but also notes the Project will follow an existing transmission line. Until more information can be provided on the design, we cannot concur with no significant impact and recommend further consultation with our office to determine if mitigation is needed; B2H-BA-337 Oregon Trail ACEC – Powell Creek Segment: The VAHP notes that the Project will "partially obstruct views of distant hills" but "the towers would blend in with the hillside beyond the valley." Once the location and design of the poles are determined we recommend further consultation with our office to determine if mitigation is needed; There was no VAHP provided for 4B2H-EK-41 Oregon Trail Unnamed Segment. Since the segment was identified as eligible/contributing, we cannot concur without the necessary information; and 050305144SI Kiwanis Oregon Trail Monument: The site form notes that Project will follow an existing transmission line. Based on the photo it is assumed new lines will not be visible. Can this be confirmed with additional photos and information on the height of the new transmission line? Also, the VAHP form has inconsistent information about the distance from the project.

Broadly speaking, we agree with the framework for potential minimization and mitigation for direct and indirect impacts to above-ground historic properties. We appreciate that the HPMP considers resource-specific impacts for contributing segments and cumulative impacts. Since resource-specific mitigation plans should be developed in consultation with a number of parties including our office, Tribes, local historical societies/museums, and historic preservation groups, we hope that Idaho Power will be open to additional ideas that are proposed by parties during the development of these resource-specific mitigation plans.

Taking into account mitigation for impacts, and based solely on the information provided in Exhibit S, we believe that the construction and operation of the facility is not likely to result in significant adverse impacts to above-ground historic resources.

If you have any questions regarding above ground resources, please contact Tracy Schwartz, Historic Preservation Specialist at 503-986-0661 or Tracy.Schwartz@Oregon.gov. For archaeological resources, please contact John Pouley, Assistant State Archaeologist at 503-986-0675 or John.Pouley@Oregon.gov.

We look forward to continuing to review this undertaking under Section 106 of the National Historic Preservation Act (NHPA) as outlined in the *Programmatic Agreement Among the Bureau of Land Management, the U.S.D.A. Forest Service, the Bonneville Power Administration, the U.S. Army Corps of Engineers, Bureau of Reclamation, the Advisory Council on Historic Preservation, the Oregon SHPO, Idaho SHPO, the Washington DAHP, the Confederated Tribes of the Umatilla Indian Reservation THPO, National Park Service, Idaho Power Company Regarding Compliance with the NHPA for the Construction of the Boardman to Hemingway 500 kV Transmission Line Project*. The BLM and other federal agencies can use the information provided in these site forms to help guide future decisions for determinations of eligibility and evaluations of effects under Section 106 as appropriate.

Sincerely,

A handwritten signature in cursive script that reads "John D. Pouley". The signature is written in black ink and is positioned below the word "Sincerely,".

John Pouley, M.A., RPA
Assistant State Archaeologist
(503) 986-0675
john.pouley@oregon.gov

cc: Maxwell Woods, Oregon Department of Energy

**B2HAPPDoc13-29 ASC Reviewing Agency Comment SHPO Case No. 08-2232
Response to IPC Schwartz 2019-05-13**

TARDAEWETHER Kellen * ODOE

From: SCHWARTZ Tracy * OPRD
Sent: Monday, May 13, 2019 9:14 AM
To: TARDAEWETHER Kellen * ODOE
Cc: maxwell.woods@state.or.us; 'Stokes, Mark'; POULEY John * OPRD
Subject: SHPO Case Nbr SHPO Case No.: 08-2232, Boardman To Hemingway Transmission Line Project (B2H)
Attachments: SHPO Response Letter Case Nbr SHPO Case No._ 08-2232.pdf

Good Morning Kellen,

Attached is our response to Idaho Power's May 8, 2019 letter. I hope this clarifies some of the issues that they raised. Please let me or John know if additional information or clarification is needed.

Thanks and have a super great week!
-Tracy

Tracy Schwartz
Review & Compliance | Historic Preservation Specialist Oregon SHPO
725 Summer Street NE, Suite C
Salem, OR 97301
Phone: (503) 986-0677



Oregon

Kate Brown, Governor

Parks and Recreation Department

State Historic Preservation Office

725 Summer St NE Ste C

Salem, OR 97301-1266

Phone (503) 986-0690

Fax (503) 986-0793

www.oregonheritage.org



May 13, 2019

Ms. Kellen Tardaewether
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301

RE: SHPO Case No. 08-2232

Boardman To Hemingway Transmission Line Project (B2H)
Construct powerline from Boardman, OR to Hemingway, ID
multiple sections, Boardman and Murphy, Morrow/ Umatilla/Union/Baker/Malheur County

Dear Ms. Tardaewether:

We have received a response from Idaho Power Company (IPC), dated May 8, 2019, regarding our review of Exhibit S of Application for Site Certificate for the Boardman to Hemingway Transmission Line Project. We appreciate that IPC is committed to continued consultation under Section 106 of the National Historic Preservation Act to address some of the concerns regarding cultural resources within the project area. IPC did request clarification regarding two points in our April 29, 2019 letter.

1. IPC is correct and our statement should have read, "Taking into account mitigation for impacts and based solely on the information provided in Exhibit S, we believe that the construction and operation of the facility is not likely to result in significant adverse impacts to historic, cultural, and archaeological resources that have been listed [in], or would likely be listed [in] the National Register of Historic Places," pursuant to OAR 345-022-0090(1).
2. With regard to their second comment, if direct effects can be avoided entirely then there will be no significant impact as a result of those direct effects. However, we do agree with IPC, and within the framework of the Oregon Energy Facility Siting Council, that if those direct effects are also minimized and mitigated then they will also result in no significant impact.

If you have any questions regarding above ground resources, please contact Tracy Schwartz, Historic Preservation Specialist, at 503-986-0677 or Tracy.Schwartz@Oregon.gov. For archaeological resources, please contact John Pouley, Assistant State Archaeologist, at 503-986-0675 or John.Pouley@Oregon.gov.

Thank you again for the timely response and we look forward to continued consultation with IPC on this undertaking.

Sincerely,

Tracy Schwartz
Historic Preservation Specialist
(503) 986-0677
tracy.schwartz@oregon.gov

cc: Maxwell Woods, Oregon Department of Energy



TARDAEWETHER Kellen * ODOE

From: Stokes, Mark <MStokes@idahopower.com>
Sent: Wednesday, May 8, 2019 1:23 PM
To: POULEY John * OPRD; SCHWARTZ Tracy * OPRD; JOHNSON Ian * OPRD
Cc: Stanish, David; Baker, Shane; English, Aaron; TARDAEWETHER Kellen * ODOE; Wymond, Dave
Subject: B2H IPC Follow-Up Letter
Attachments: 2019-05-08 Oregon SHPO Letter from IPC.pdf

John, Tracy, and Ian,

Attached is a letter from Idaho Power to Oregon SHPO following-up on your revised comment letter submitted to ODOE. Specifically, we are asking you to review the two clarification statements on page 3 of the letter and let ODOE and Idaho Power know if you concur or not. If you feel like a conference call to discuss this in more detail would be helpful, please let me know and I'll take care of setting it up.

Time is getting short on this, so your prompt attention would be appreciated.

Thank you.

Mark Stokes

ENGINEERING PROJECT LEADER
Idaho Power Company
Work (208) 388-2483 | Cell (208) 863-0043
mstokes@idahopower.com

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TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Wednesday, May 8, 2019 1:42 PM
To: POULEY John * OPRD; SCHWARTZ Tracy * OPRD; JOHNSON Ian * OPRD
Subject: RE: B2H ASC IPC Follow-Up Letter Request
Attachments: B2HAPP ASC Oregon SHPO Request Letter from IPC 2019-05-08.pdf

Hi all,

Idaho Power compiled and sent the attached response letter to SHPO requesting SHPO's clarification. They point out a few topics of that I agree should be followed up on. Could you please review their letter and provide clarifications to their requests? I know you're busy but because I am trying to get the B2H DPO issued in the next 1.5 weeks, and having a clear record would be very helpful for us to reference in the DPO. Tracy and John, could you please review and provide responses by Monday or Tuesday next week? If it saves time to reply by email, that's fine and I'll save the email as an agency comment. Anyhow...let me know and I appreciate the help!

Kellen

Kellen Tardaewether

Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
Salem, OR 97301
P:(503) 373-0214
C: (503) 586-6551
Oregon.gov/energy



Leading Oregon to a safe, clean, and sustainable energy future.

From: Stokes, Mark [mailto:MStokes@idahopower.com]
Sent: Wednesday, May 8, 2019 1:23 PM
To: POULEY John * OPRD <John.Pouley@oregon.gov>; SCHWARTZ Tracy * OPRD <Tracy.Schwartz@oregon.gov>; JOHNSON Ian * OPRD <Ian.Johnson@oregon.gov>
Cc: Stanish, David <DStanish@idahopower.com>; Baker, Shane <SBaker@idahopower.com>; English, Aaron <Aaron.English@tetrattech.com>; TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>; Wymond, Dave <DWymond@idahopower.com>
Subject: B2H IPC Follow-Up Letter

John, Tracy, and Ian,

Attached is a letter from Idaho Power to Oregon SHPO following-up on your revised comment letter submitted to ODOE. Specifically, we are asking you to review the two clarification statements on page 3 of the letter and let ODOE and Idaho Power know if you concur or not. If you feel like a conference call to discuss this in more detail would be helpful, please let me know and I'll take care of setting it up.

Time is getting short on this, so your prompt attention would be appreciated.

Thank you.

Mark Stokes

ENGINEERING PROJECT LEADER

Idaho Power Company

Work (208) 388-2483 | Cell (208) 863-0043

mstokes@idahopower.com

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May 8, 2019

John Pouley, M.A., RPA
Assistant State Archaeologist
Oregon State Historic Preservation Office
725 Summer Street, NE, Suite C
Salem, OR 97301-1266

RE: SHPO Case No. 08-2232
Boardman to Hemingway Transmission Line Project (B2H)

Dear Mr. Pouley,

Thank you for your letter dated April 29, 2019 and the associated comments and findings concerning Exhibit S of Idaho Power Company's (IPC's) Application for Site Certificate (ASC) for the Boardman to Hemingway Transmission Line Project (B2H) that was prepared consistent with Oregon's Energy Facility Siting Council (EFSC) statutes and rules (Oregon Revised Statute (ORS) Chapter 469 and Oregon Administrative Rules (OAR) Chapter 345, Division 1). This letter 1) discusses the completeness and compliance reviews performed for Exhibit S after IPC submitted an Amended Preliminary Site Certificate Application (pASC) on July 19, 2017 to the present; and 2) confirms and clarifies your comments concerning Exhibit S as they pertain to the applicable EFSC standards for Historic, Cultural and Archaeological Resources.

Background

Following IPC's submittal of the pASC on July 19, 2017, the Oregon Department of Energy (ODOE), HRA (a third-party contractor working under the supervision of ODOE), and the Oregon State Historic Preservation Office (SHPO) reviewed Exhibit S. HRA (through ODOE) provided a Request for Additional Information (RAI) #1 on November 3, 2017.¹ Another request (RAI #2) was delivered to IPC on March 2, 2018.² IPC addressed these comments and concerns and revised Exhibit S accordingly. ODOE subsequently issued its Second Amended Project Order on July 26, 2018. Following a review of the Order, IPC revised Exhibit S again and provided ODOE with those revisions.³ Following a "Completeness Check" of the revised Exhibit S by HRA (August 31, 2018) and ODOE (September 12, 2018) and with the concurrence of the SHPO (September 20, 2018), the ASC was deemed complete by ODOE on September 28, 2018. After the completeness phase, HRA, ODOE, and SHPO undertook a compliance level review of Exhibit S and provided comments for Exhibit S on November 9, November 13, and December 6, 2018,

¹ The SHPO provided correspondence concurring with the HRA RAI #1 on November 13, 2017.

² The SHPO provided correspondence concurring with the HRA RAI #2 on March 21, 2018.

³ See <https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/2018-09-28-B2H-ASC-Exhibit-S.pdf>.

Pouley

Page 2 of 4

May 8, 2019

respectively. IPC addressed those comments and prepared an Errata for Exhibit S, as well as for Attachments S-6 (Cultural Resources Technical Report), S-9 (Historic Properties Management Plan), and S-10 (Intensive Level Survey – Visual Assessment of Historic Properties (VAHP) Report).⁴ The Errata for Exhibit S and Attachment S-9 were published for public review by ODOE in February 2019. On April 29, 2019, the SHPO provided its final comments on the Errata and concluded, that after, “Taking into account mitigation for impacts and based solely on the information provided in Exhibit S, we believe that the construction and operation of the facility is not likely to result in significant adverse impacts to above ground historic resources,” thus partially satisfying OAR 345-022-0090(1)(a). The letter, however, does not specifically mention an impact finding for cultural and archaeological resources covered under OAR 345-022-0090(1)(a), archaeological objects and sites on private land (OAR 345-022-0090(a)(1)) and archaeological sites on public land (OAR 345-022-0090(1)(c)).

Responses to SHPO Comments Concerning Exhibit S

IPC agrees in concept with SHPO’s discussion concerning the treatment of certain above ground historic resources, archaeological resources and/or sites as unevaluated until their eligibility for the National Register of Historic Places (NRHP) can be verified through the Section 106 consultation process as codified in 36 C.F.R. Part 800. These resources will be avoided by any potential project activities in the interim period. IPC also agrees that the Section 106 Programmatic Agreement (Exhibit S, Attachment S-5) and the Historic Properties Management Plan (HPMP) (Exhibit S, Attachment S-9) shall serve as the consultation blueprint for further identification efforts, resolving NRHP eligibility, and avoiding, minimizing, and/or mitigating potential project impacts to resources covered under the EFSC standards contained in OAR 345-022-0090.⁵

Resource Specific Responses and Resolution

Resource 4B2H-EK-47 was recommended as not eligible in the text of the site form. The discrepancies in Exhibit S mapping and SHPO database will be rectified during the Section 106 process. The resource will be treated as likely eligible and avoided by project activities until a federal agency makes the final determination of eligibility, in concurrence with the SHPO.

⁴ See <https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/2019-03-28-B2H-ASC-Exhibit-S-Errata-Info-Redacted.pdf> and <https://www.oregon.gov/energy/facilities-safety/facilities/Facilities%20library/2019-03-28-B2H-ASC-Exhibit-S9-Errata-Info.pdf>.

⁵ The formal title of the Programmatic Agreement is *Programmatic Agreement Among the Bureau of Land Management, the U.S.D.A. Forest Service, the Bonneville Power Administration, the U.S. Army Corps of Engineers, Bureau of Reclamation, the Advisory Council on Historic Preservation, the Oregon SHPO, Idaho SHPO, the Washington DAHP, the Confederated Tribes of the Umatilla Indian Reservation THPO, National Park Service, Idaho Power Company Regarding Compliance with the NHPA for the Construction of the Boardman to Hemingway 500 kV Transmission Line Project*.

Pouley

Page 3 of 4

May 8, 2019

B2H-UN-005 (Whiskey Creek Segment) shall be treated as likely eligible for the NRHP and avoided by project activities until a federal agency makes the final determination of eligibility, in concurrence with the SHPO during the Section 106 process.

The inventory form in the revised Exhibit S (Attachment S-10), revised SHPO database, and the Exhibit S Errata Sheet (page S-70) that discusses B2H-MA-003 Meek Cutoff applies all of the NRHP Criteria for Evaluation and the fieldwork methods employed during its assessment are described in the Exhibit S, as well as Attachments S-2 (VAHP Plan), S-6, S-7 (Reconnaissance Level Survey), and S-10. Project crossings and the route, as identified by NPS GIS shapefiles within the Analysis Area, were assessed in the field and no evidence of the trail was identified. Furthermore, a Class I research review was utilized to identify potential routes in the area. Meek Cutoff shall be treated as likely eligible for the NRHP and avoided by potential project activities until a federal agency makes the final determination regarding eligibility, in concurrence with the SHPO, during the Section 106 process.

The following resources will remain unevaluated for the NRHP and avoided by project activities until a federal agency makes a final determination of eligibility, in concurrence with the SHPO during the Section 106 process: B2H-SA-37, 4B2H-EK-43, 6B2H-MC-07, and 4B2H-EK-26.

The following resources will be avoided by project activities until the SHPO's concerns regarding the potential for project impacts are resolved through the Section 106 process. These resources include 4B2H-EK-04, 6B2H-RP-09, B2H-BA-337, 4B2H-EK-41, and 050305144SI.

Request for Clarifications

Given the comments and findings of the April 29, 2019 letter from SHPO, IPC requests the following clarifications:

- 1) That when SHPO determined that, "Taking into account mitigation for impacts and based solely on the information provided in Exhibit S, we believe that the construction and operation of the facility is not likely to result in significant adverse impacts to above ground historic resources" the agency intended this statement to include not just "historical resources" covered under OAR 345-022-0090(1)(a) but also cultural and archaeological resources covered under OAR 345-022-0090(1)(a), archaeological objects and sites on private land (OAR 345-022-0090(1)(b)) and archaeological sites on public land (OAR 345-022-0090(1)(c)).
- 2) Given its previous statement in the letter, that when SHPO noted that, "With regard to direct effects, if all project impacts can be avoided then we concur that the undertaking will result in no significant adverse impact." the agency intended to say that if all project-related direct impacts to resources covered under OAR 345-022-0090 are avoided, minimized, or otherwise mitigated through measures included in

Pouley

Page 4 of 4

May 8, 2019

Exhibit S and Attachment S-9 (HPMP), then the construction and operation of the facility is not likely to result in significant adverse impacts to resources described in OAR 345-022-0090(1).

Thank you again for your assistance on this project. Please call Mark Stokes (208) 388-2483 or Aaron English (208) 489-2851 if you should have any questions or concerns.

Sincerely,



M. Mark Stokes, PE
Engineering Project Leader

cc: Ian Johnson, Oregon SHPO
Tracy Schwartz, Oregon SHPO
Kellen Tardaewether, ODOE
Aaron English, Tetra Tech

B2HAPPDoc18 ASC ODOE RAIs_ Exhibit S_AA_U_W 2018-12-08 to 2019-04-06

TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Thursday, December 6, 2018 9:02 AM
To: 'Stokes, Mark'; 'Stanish, David'; English, Aaron
Cc: Baker, Shane; kirk.ranzetta@aecom.com; 'King, Erin'; WOODS Maxwell * ODOE (Maxwell.Woods@oregon.gov); Wymond, Dave
Subject: B2H ASC Follow up Exhibit S Direct Impacts and Mitigation Proposals

Good morning all,

Based on the discussion from the call on Monday, the below email is guidance and an additional information request regarding information within Exhibit S.

ODOE previously stated that resources on properties where IPC has gained site access shall be evaluated with proposed eligibility determinations and mitigation, if necessary, prior to issuance of the Draft Proposed Order (DPO). IPC has provided proposed mitigation measures based on the type of impact and on the type of resource. However, this information is dispersed throughout the ASC Exhibit S and Attachments (confidential and non-confidential). Additionally, the information for proposed mitigation for eligible resources that are directly impacted require more detail.

- 1.) ODOE is requesting that IPC provide a more robust discussion of mitigation proposals in Exhibit S (HPMP, and the body of Exhibit S, as appropriate). IPC should describe in more details each mitigation measure found in Table 6-2, 6-3 and 6-4 in Exhibit S. Attachments S-10, explains that "...Mitigation plans may include completion of NRHP nomination forms, conservation easements, purchase of land for long-term protection of historic properties, partnerships and funding for public archaeology projects, partnerships and funding for historic properties interpretation, and/or print or media publication..." Each of these items should be provided and discussed in the non-confidential portion of Exhibit S in more detail as to which proposals correspond to what type of resource.
- 2.) ODOE is requesting IPC expand on the mitigation proposals for direct impacts to resources. Table 6-2 lists mitigation measures for direct impacts to resources. However, the level of detail for indirect impacts to resources found in Tables 6-3 and 6-4 is more detailed than mitigation for direct impacts. The level of detail for mitigation measures for direct impacts to resources should be more detailed and site-specific. The level of details for mitigation for direct impacts should be commensurate to the impact. For each eligible resource found in Table S-2 that states that there is a proposed direct impact, IPC should provide a mitigation proposal in a level of detail that is commensurate for the impacts (for Oregon Trail resources and all other eligible resources with direct impacts). For example, if IPC is proposing to directly impact an eligible segment of the Oregon Trail by siting a tower foundation or building an access road across it, IPC should provide a mitigation proposal discussing how it will mitigate this impact by securing, preserving, funding, or conserving a similar currently unprotected Trail segment, or something of the like.
- 3.) Alternatively, IPC can re-visit Table S-2 and re-evaluate whether or not there will indeed be direct impacts to eligible resources. If, at this point, IPC knows that it can site the facility to avoid direct impacts IPC may:
 - a. Represent that there will not be direct impacts to eligible resources and describe mitigation for indirect impacts, if applicable
 - b. Represent in a condition that avoidance of direct impacts to eligible resources will occur as part of final design and construction
- 4.) Where in the materials does IPC describe what activities are proposed to occur in the sites that IPC states will be impacted directly or indirectly?

I hope this helps explain what ODOE is requesting. Please let me know if you would like to discuss further or have additional questions. Thanks!

Kellen

Kellen Tardaewether

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TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Wednesday, March 6, 2019 1:05 PM
To: 'Stokes, Mark'
Cc: English, Aaron; Stanish, David
Subject: B2H ASC RAI's for Public Services and Siting Standards for T-Lines EMF
Attachments: B2HAPP ASC_ODOE RAI_Exhibit U.DOCX; B2HAPP ASC_ODOE RAI_Exhibit AA.DOCX; B2HAPP ASC Tracking Doc Additional Info to ASC 2019-03-06.docx; B2HAPPDoc ApASC Reviewing Agency Comment ODA_Caines 2018-02-21.pdf

Good afternoon,

Please see the attached Word documents that outline RAI's the Department is requesting responses to, and if necessary, revisions or additions to the ASC in an errata sheet be provided to the Department.

- The first attachment is for Public Services, primarily in response to the letter from ODA. Please respond to ODA's comments and, if necessary, indicate what responses will be provided in an errata sheet.
- The second attachment is a draft section/portion of section from the DPO for Division 24 – Siting Standards for Transmission Lines (Exhibit AA). Comments and RAI's are in the form of comment bubbles in the margin and not in a table. IPC responses maybe provided in a table and/or errata sheet, etc. Please review and have your engineering Dept provide feedback as necessary.
- The third attachment is an updated version of the additional info tracking sheet I've sent previously.

It would be the most helpful for ODOE to receive responses or draft errata sheets ASAP for the below items so that we may use this info to complete drafting sections in the DPO:

Exhibit W
Exhibit U
Exhibit AA

That said, final versions of all errata will be submitted as a package per Exhibit once IPC has prepared the documents in coordination with ODOE. Thanks!

Kellen

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Comments and RAI's included in the comment bubbles.

DRAFT Section Portions of IV.P. Division 24 Standards

Electric Fields

The electric charge (measured as voltage) on an energized transmission line conductor produces electric fields. The greater the overall transmission line voltage, the greater the strength of the electric field. In contrast, the amount of current flowing on the conductor, which fluctuates daily and seasonally with changes in electricity usage, does not impact the strength of electric fields produced by the conductor. Electric fields diminish in strength proportional to distance from the transmission line conductors (the greater the distance from the conductors, the lower the electric fields), and are weakened or blocked by conductive objects (such as trees or buildings).¹

Commented [KT1]: This doesn't take into account that the amount of current flowing on the conductor leads to greater line sag, therefore bringing the same amount of electric fields closer to the ground (meaning, the receptor thereby experiences higher electric fields, because the closer to the source, the higher the electric field experienced).

The applicant used a model developed by the Electric Power Research Institute² (which utilizes a methodology developed by the Bonneville Power Administration) to calculate the electric fields, measured in units of kilovolts per meter (kV/m), which would be produced by the proposed new 500 kV transmission line, rebuilt 230-kV transmission line, and rebuilt 138-kV transmission line. The model considered the following line geometries that the applicant expects to use in Oregon:

- 500-kV transmission line on a single-circuit lattice tower (delta configuration; ASC Exhibit B, Figure B-15) with a minimum ground clearance of 34.5 feet
- 230-kV transmission line on a single-circuit H-frame structure (horizontal configuration; ASC Exhibit B, Figure B-19) with a minimum ground clearance of 20 feet
- 138-kV transmission line on a single-circuit H-frame structure (horizontal configuration; ASC Exhibit B, Figure B-20) with a minimum ground clearance of 20 feet

In addition, the applicant modeled the electric fields from one alternative geometry that would be used when unique siting concerns require the use of special structures:

- 500-kV transmission line on a single-circuit H-frame or Y-frame structure (horizontal configuration; see ASC Exhibit B, Figures B-16 and B-17) with a minimum ground clearance of 34.5 feet

The model used the nominal voltage of the 230-kV and 138-kV transmission lines, but evaluated a more conservative (higher) voltage of 550-kV for the 500-kV transmission line to account for overvoltage situations. The model provided the predicted electric field levels out to distances of 200 feet on either side of each proposed transmission line structure type. Table X-X, reproduced from ASC Exhibit DD, Table DD-1, summarizes the electric field strengths at the

Commented [KT2]: See footnote below for circumstances/conditions where maximum line sag may occur.

¹ B2HAPPDoc3-44 ASC 27 Exhibit AA EMF ASC 2018-09-28, Section 3.2.1.

² The model is EMFWorkstation: ENVIRO (Version 3.52).

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peak and edge of the ROW for each of these transmission line configurations. The 500-kV single-circuit lattice tower configuration would produce the highest electric fields. As shown in Table X-X, the maximum electric field modeled is 8.9 kV/m at one meter above the ground. This value is slightly below the limit for electric fields from transmission lines (set at OAR 345-024-0090(1)) of not more than 9 kV per meter at 1 meter above the ground surface in areas that are accessible to the public.

Table X-X: Electric Field Strength for Each Considered Structural Configuration

Structure Type	ROW Width (feet)	South/West ROW Edge (kV/m)	Maximum within ROW (kV/m)	North/East ROW Edge (kV/m)
500-kV lattice	250	0.8	8.9	0.8
500-kV tubular steel H-frame and Y-frame monopole	250	0.9	8.8	0.9
230-kV wood H-frame	125	0.8	5.0	0.8
138-kV wood H-frame	100	0.5	2.3	0.5

Electric field strength calculated at standard height of one meter above ground surface.
 kV/m = kilovolt per meter; ROW = right-of-way

The applicant’s position is that post-construction monitoring of electric fields is unnecessary because the modeling results assumed worst-case conditions of line overvoltage and minimum ground clearance, and those conservative calculations show that the electric fields would be slightly below the threshold established at OAR 345-024-0090(1).³ As previously stated, the applicant’s modeling exercise assumed a minimum conductor ground clearance of 34.5 feet. The applicant requests a site certificate condition establishing a minimum clearance for the 500-kV transmission line conductors of 34.5 feet from the ground “at normal operating conditions.”⁴ However, such a condition would allow a lesser minimum conductor clearance when the line is operating outside of normal operating conditions, such as at maximum line sag.⁵ Because the model shows that maximum electric fields that would be produced by the 500-kV lattice single-circuit lattice tower configuration is 8.9 kV/meter at one meter above the ground when the line is modeled at 34.5 feet from the ground, a lesser minimum conductor clearance could result in electric fields that exceed 9 kV/m at 1 meter above the ground. Therefore, the Department recommends that the Council adopt the following condition requiring that the certificate holder design and construct the 500-kV transmission line with a minimum ground clearance of 34.5 feet under all conditions:

Commented [KT3]: The modeling assumed overloading and minimum clearance but did not take into account similar circumstances in addition to hot temperatures as well as when lines cross.

³ B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.8.
⁴ B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.7.
⁵ On hot days and when a transmission line is heavily loaded (e.g., on summer days when demand for electricity to run air conditioners is high), the conductor heats and expands, causing the line to sag closer to the ground.

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Recommended Siting Standards for Transmission Lines Condition 1: To reduce or manage human exposure to electromagnetic fields, the certificate holder shall design and construct:

- a. All aboveground 500-kV transmission lines such that a minimum clearance of 34.5 feet from the ground is maintained **under all conditions**;
- b. All aboveground 230-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions; and
- c. All aboveground 138-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions.

In areas where an existing transmission line would parallel a proposed transmission line, the electric fields within the transmission line ROW may increase or decrease depending on the proximity, load, and phasing of the parallel line.⁶ Therefore, in addition to modeling the electric fields that would be produced by each transmission line alone, the applicant also modeled the interactions between the electric fields that would be produced by the 500-kV lattice structures and the electric fields that would be produced by parallel transmission lines.⁷ ASC Exhibit AA, Figure AA-9 shows that existing parallel lines located near the proposed 500-kV corridors will not result in exceedances of 9 kV/m at 1 meter above the ground surface, in compliance with OAR 345-024-0090(1). The proposed 500-kV transmission line has the potential to exceed this threshold, however, where the line would cross (rather than parallel) existing transmission lines.

[applicant representations and conditions]

Induced Voltage and Current

The Siting Standards for Transmission Lines requires the Council to find that the applicant “can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.”

As explained in ASC Exhibit DD, the flow of electricity in a transmission line can induce a small electric charge, or voltage, in nearby conductive objects, such as metallic objects (e.g., vehicles, equipment, metal fences, signs, and metallic roofs). An induced electric charge can flow, or

⁶ A single-circuit transmission line carries one phase in each of its three conductors. The voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of the 360 degree cycle. The fields from these conductors tend to cancel out because of this phase difference. Therefore, depending on the geometry and arrangement of the conductors in the parallel transmission line, a parallel transmission line can either increase or decrease the electric fields within the transmission line ROW. B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.2.1.

⁷ The 500-kV lattice configuration would produce the highest electric fields; therefore, the applicant modeled the interaction of electric fields from parallel transmission lines with the electric fields from this transmission line configuration. B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.5.3.

Commented [KT4]: The proposed 500-kV transmission line has the likely potential to exceed the 9 kV/m at 1 m above the ground threshold where the line would cross (rather than parallel) existing transmission lines. How does IPC plan to design, engineer, construct and operate the transmission line to avoid an exceedance (out of compliance with the standard) at crossings.

Commented [KT5R4]: In areas where crossings occur, the vertical transmission line height and separation will be selected during detailed design in a manner to maintain electric fields in the area of the crossing below the 9 kV/m standard. Table AA-3 shows the existing adjacent lines for the Proposed Route by county AA-9

Commented [KC6]: The applicant's current proposed condition is:

During construction, the certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields:

In areas where aboveground transmission line will cross an existing transmission line, constructing the transmission line at a height and separation ensuring that alternating current electric fields do not exceed 9-kV per meter at one meter above the ground surface

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become electric current, when a path to ground is presented. For example, a vehicle that is insulated from grounding by its tires and is parked under a transmission line long enough to build up a charge can cause humans that touch the vehicle to experience a momentary shock as the person becomes the conducting path for the current to flow to ground. A person can generally notice induced current if the available electrical charge is greater than 1 milliampere (mA), and at 5 mA most children (99.5 percent) are able to still let go of an electrified object.⁸ The National Electric Safety Code (NESC) sets a performance standard at Rule 234G.3 limiting the steady-state current due to electrostatic effects to 5 mA.

The strength of the induced current in an object is positively related to the electric field strength of a nearby transmission line. The applicant therefore calculated the induced current expected to result for various objects located near the 500-kV lattice configuration, because this configuration would produce the strongest electric fields. Table X-X below, reproduced from Table DD-2 of ASC Exhibit DD, shows the maximum current that could be induced in several types of vehicles and agricultural equipment if those objects were located in the transmission line ROW. The maximum induced current is calculated by multiplying the factors in the middle column (derived from an Electric Power Research Institute publication) by the maximum expected electric field strength from the proposed facility (under normal operating conditions). As shown in Table X-X, cars, pickup trucks, and combines located within the ROW of the 500-kV lattice transmission line configuration would build up an inducible charge that would be less than the 5-mA threshold established by the NESC. If a large tractor-semitrailer were located parallel to and directly under the transmission line, it would have the potential to build up an inducible charge that would exceed the 5-mA threshold. However, the applicant explains that tractor-semitrailers are unlikely to drive directly under and parallel to the line; tractor-semitrailers may briefly cross under the line where the transmission line crosses a road, but in these circumstances the tractor-semitrailer would be under the transmission line for only a short duration and would not be parallel to the line. If the transmission line crossed a location where tractor-semitrailers may be parked long enough to build up an inducible charge (such as at a gas station or a parking lot), the resulting induced current may exceed the 5-mA threshold; therefore, the applicant represents that at these locations it would alter the transmission line design if necessary to ensure that the line complies with the 5-mA threshold established by the NESC.

Table X-X: Induced Current Factors

Object	Isc/E (mA/kV/m)	Maximum Induced Current (mA) ¹
Car—L 4.6 m x W 1.78 m x H 1.37 m	0.088	0.78
Pickup Truck—L 5.2 m x W 2.0 m x H 1.7m	0.10	0.89
Large Tractor-Trailer—Total Length 15.75 m Trailer: 12.2 m x W 2.4 m x H 3.7 m	0.64	5.70
Combine—L 9.15 m x W 2.3 m x H 3.5 m	0.38	3.38

Source: Table 7-8.2, EPRI AC Transmission Line Reference Book: 200 kV and Above (EPRI 2005)

⁸ B2HAPPDoc3-47 ASC 30_Exhibit DD_Specific Standards_ASC 2018-09-28, Section 3.4.1.

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¹ Maximum induced current calculated for strongest predicted electric field of 8.9 kV/m, associated with the proposed lattice segment.
I_{sc} = short-circuit current E = AC electric field
m = meter

To reduce the risk of induced current and nuisance shocks, the applicant proposes to inform landowners of the risks of induced current, develop and implement a program to ground or bond conductive objects or structures that could become charged by the electric fields from the transmission line, and to follow NESC grounding requirements. The applicant therefore proposes, and the Department recommends, that the Council impose the following site certificate condition:

Recommended Siting Standards for Transmission Lines Condition 2: Prior to placing the facility in service, the certificate holder shall take the following steps to reduce the risk of induced current and nuisance shocks:

- a. Provide to landowners a map of overhead transmission lines on their property and advise landowners of possible health and safety risks from induced currents caused by electric and magnetic fields.
- b. Develop and implement a program that provides reasonable assurance that all fences, gates, cattle guards, trailers, irrigation systems, or other objects or structures of a permanent nature that could become inadvertently charged with electricity are grounded or bonded throughout the life of the line.
- c. Implement a safety protocol to ensure adherence to National Electric Safety Code grounding requirements.

In addition, the applicant states that IPC would design, construct, and operate the facility in accordance with the version of the NESC that is most current at the time final engineering of the facility is completed. The applicant proposes and the Department recommends that the Council adopt the following condition:

Recommended Siting Standards for Transmission Lines Condition 3: The certificate holder shall design, construct, and operate the transmission line in accordance with the requirements of the version of the National Electrical Safety Code that is most current at the time that final engineering of the facility is completed.

Like the proposed transmission lines (the new 500 kV transmission line, rebuilt 230-kV transmission line, and rebuilt 138-kV transmission line), the Longhorn Station and communication stations have the potential to generate induced currents in nearby conductive objects. To reduce the risk of induced current and nuisance shocks from the Longhorn Station and communication stations, the applicant proposes to....[fill in once we receive more information from the IPC].

Commented [KT7]: EFSC Site Specific Conditions [OAR 345-025-0010] has an out-of-date NESC reference. This is a draft condition ODOE is considering to replace or use in conjunction with the site-specific condition.

Commented [KT8]: The standard states: *Can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.*

Exhibit DD says, "Longhorn Station and communication stations will be constructed in a manner to minimize induced currents in surrounding facilities" but doesn't provide any specifics.

Please explain how the Longhorn Station and communication stations would be constructed (e.g., with a grounding mat) to minimize induced currents in nearby conductive objects.

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[consider recommending a condition related to grounding the substation and communication stations]

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Request for Additional Information for the ASC (ASC RAI) Exhibit U – Public Services
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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 1	Attachment U-1C	Attachment U-1C and page U-25		<p>ASC Exhibit U, Attachment U-1C provides correspondence with fire prevention agencies. The Oregon Department of Forestry and the Union County Emergency Services-Fire Department both expressed concerns about waiting times and delayed response times due to waiting for the transmission line to be de-energized. Page U-25 of Exhibit U states the ODF “Rangeland Coordinator expressed concern regarding the risk of fighting fires near energized transmission lines, because electricity could arc through the smoke and strike firefighters” However, this does not appear to be the concern of ODF described in Attachment U-1C.</p> <p>Please provide a description of the procedures that IPC would employ to de-energize the transmission lines in the event of an emergency? Please include how the operation/control center notify local emergency agencies, conversely how do local emergency agencies notify the control center of an emergency that necessitates shutting the transmission line down? What are the response times associated with de-energizing the line?</p>	

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ASC RAI U- 2		Page U-25		<p>Page U-25 states, “Construction workers and maintenance personnel are not trained firefighters and are not expected to fight fires. However, qualified equipment operators, at the direction of Incident Command, may use construction equipment to assist local firefighting efforts when safe to do so.”</p> <p>What, who and where is Incident Command?</p> <p>Section 2.1.1 of the Fire Prevention and Suppression Plan states that “The Contractor and IPC will train all personnel on the measures to take in the event of a fire. The Contractor and IPC will immediately proceed to control and extinguish any fire started resulting from their activity.” Yet page U-25 states, “Construction and operations crews will implement the Fire Prevention and Suppression Plan, so that the Project will not increase the risk of fire. Construction workers and maintenance personnel are not trained firefighters and are not expected to fight fires...”</p> <p>What construction personnel are expected to use the equipment listed in Section 2.1.5 of the Fire Prevention and Suppression Plan? How will they be trained?</p>	
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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 3	Section 2.1.5	Attachment U-3	OAR 437-007-1315	<p>To reflect the requirements of OAR 437-007-1315 and in response to the comments from ODF, the revised Fire Prevention and Suppression Plan states that, “The firewatch... be qualified in the use and operation of assigned firefighting equipment and tools; be physically capable of performing assigned fire suppression activities; and be advised of single employee assignment responsibilities.... Each person providing fire watch service on an operation area must have adequate facilities for transportation and communication to be able to summon firefighting assistance in a timely manner.”</p> <p>Please describe during construction who will operate as the Firewatch? How will they be trained? How many personnel will receive this training? Which personnel will trained and authorized to operate the equipment listed in Section 2.1.5. See also RAI above.</p>	

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 4	Section 3.4.7 and 3.5.6.3	U-18 and U-26		<p>Page U-26 states “Workers suffering minor injuries will be treated at local medical facilities or emergency rooms. Workers suffering more serious injuries, were they to occur, will be taken to one of the major hospitals in the project vicinity.”</p> <p>Are the “local medical facilities” included in the 3 health care facilities listed in Exhibit U?</p> <p>What are considered “minor injuries” that would require visitation to a medical facility?</p> <p>Will there be any first aid materials or facilities provided on-site?</p> <p>Will any personnel be required to hold active Fist Aid and CPR certifications?</p> <p>How will workers suffering from a minor or serious injury be transported to a medical facility?</p>	

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 4	Section 3.4.7 and 3.5.6.3			<p>In its letter on the ASC, Baker County expressed concerns about the response times and potential impacts to medical responders if they were committed to a project-related incident and would not be available to provide other services.</p> <p>Please provide a discussion of the ambulance services that serve the analysis area and how many ambulances are available to serve multiple incidents?</p>	

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Request for Additional Information for the ASC (ASC RAI) Exhibit W – Retirement
February, 2019

Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI W- 1	3.2	W-3		<p>Exhibit W describes decommission the facilities associated with the switching station “For the station, these facilities include an interconnecting bus system, switches, breakers, and instrumentation for the control and protection of the equipment.”</p> <p>However, this doesn’t match with the Cost Estimating Worksheet, which shows “N/A” for the switch yard on pages 25 and 26 of Exh W PDF) and \$0 for the switch yard on page 19 of the PDF.</p> <p>Please include costs associated with decommissioning the station.</p>	
ASC RAI W- 2	3.2	W-3		<p>Exhibit W states: “This restoration will include restoring the site to a condition suitable for uses comparable with the surrounding land uses, intended land use, and then-current technologies.”</p> <p>What is meant by current technologies?</p>	
ASC RAI W- 3		Attachment W-1 and Section 3.3		<p>PDF Page 20 of the Exh W PDF states “3rd Quarter 2016 Dollars” at the top of the page, but then the GDP index is for 2nd quarter 2016, and the text of Exh W (Section 3.3) states that it’s in 4th quarter 2016 dollars.</p> <p>What quarter of 2016 was used to generate the cost estimate?</p>	
ASC RAI W- 4		Attachment W-1 and Exhibit W		<p>The Cost Estimate states “Adjusted to Current Dollars” and “Total Site Restoration Cost (current dollars)”</p> <p>What quarter and year were last used to update for inflation?</p>	

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI W- 5		Attachment 1		The Site Restoration Cost Estimating Guide recommends that the contingency for administrative and management expenses total 10 percent (10%) of the cost estimate; however, the applicant’s cost estimate applies a value of only 4 percent (4%) yes does not explain the justification for proposing the lesser percentage. Please provide such justification.	

**B2HAPDoc19 ASC IPC Responses to ASC RAIs and Agency Comment Letters_
2019-01-14 to 2019-04-12**

TARDAEWETHER Kellen * ODOE

From: Stanish, David <DStanish@idahopower.com>
Sent: Monday, January 14, 2019 2:38 PM
To: TARDAEWETHER Kellen * ODOE
Cc: Stokes, Mark; English, Aaron
Subject: RE: SHPO's Question RE: Call with ODOE-SHPO-IPC-HRA per B2H ASC SHPO Letter
Attachments: 2019-01-14 - B2H - Exhibit S - Idaho Power's Response to Comment Letters.pdf

Kellen –

Please find attached our questions. Thanks.

David Stanish | Senior Counsel | Idaho Power Company
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From: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Sent: Monday, January 14, 2019 9:34 AM
To: Stokes, Mark <MStokes@idahopower.com>; English, Aaron <Aaron.English@tetrattech.com>
Cc: Stanish, David <DStanish@idahopower.com>
Subject: [EXTERNAL] FW: SHPO's Question RE: Call with ODOE-SHPO-IPC-HRA per B2H ASC SHPO Letter

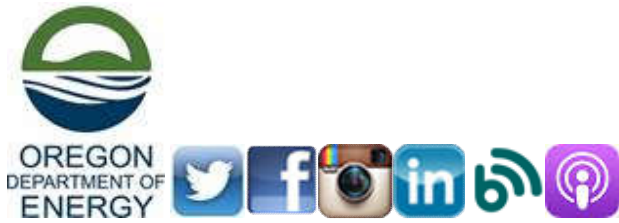
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Good morning,

Do you guys have specific questions drafted for SHPO for the call tomorrow? If so, it may help them prepare if you send them over or give a rough idea of what your questions are. My response to them is below. Thanks,

Kellen

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From: TARDAEWETHER Kellen * ODOE
Sent: Friday, January 11, 2019 4:15 PM
To: JOHNSON Ian * OPRD <Ian.Johnson@oregon.gov>
Cc: POULEY John * OPRD <John.Pouley@oregon.gov>; SCHWARTZ Tracy * OPRD <Tracy.Schwartz@oregon.gov>; WOODS Maxwell * ODOE (Maxwell.Woods@oregon.gov) <Maxwell.Woods@oregon.gov>
Subject: SHPO's Question RE: Call with ODOE-SHPO-IPC-HRA per B2H ASC SHPO Letter

There are a lot of emails going back and forth, sorry about that. To be clear, and if it's easier, the meeting I set up for Tuesday is a telephone call with IPC and HRA, so if it is easier for you to call in that would be fine.

I am unsure of the specific questions that IPC will have. ODOE wants to find out if the missing information or analysis for some resources in SHPO's letter is a comprehensive list, or just examples? I think IPC may have the same question. One of the goals for the call is to find out what information IPC needs to provide to SHPO for SHPO concurrence or other recommendations of their eligibility proposals.

Based on SHPO's eligibility recommendations (concurring or otherwise with IPC's proposals), ODOE would also like SHPO's feedback on IPC's impact assessment and mitigation proposals. That said, ODOE has requested that IPC provide a more robust discussion of mitigation proposals that will be provided as additional information to the ASC. Anyhow, I hope this helps and that you all can call-into or attend the meeting on Tuesday. Thank you!!!

Kellen

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From: JOHNSON Ian * OPRD
Sent: Friday, January 11, 2019 4:03 PM

To: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Cc: POULEY John * OPRD <John.Pouley@oregon.gov>
Subject: RE: Call with ODOE-SHPO-IPC-HRA per B2H ASC SHPO Letter

Kellen,

Thanks. Do they have specific questions? Given the issues with arranging a meeting perhaps a teleconference or we can respond to written questions. I do not want to slow this project for lack of a meeting time.

Ian



Ian P. Johnson | Associate Deputy State Historic Preservation Officer

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From: TARDAEWETHER Kellen * ODOE
Sent: Thursday, January 10, 2019 9:45 AM
To: JOHNSON Ian * OPRD
Cc: POULEY John * OPRD
Subject: Re: Call with ODOE-SHPO-IPC-HRA per B2H ASC SHPO Letter

Hi Ian and John,

Idaho Power had questions about how they should respond to SHPOs comments provided in its letter on the B2H ASC. So if SHPO could be prepared to elaborate on comments or provide examples of deficiencies I think that would be helpful. Does that help? Thanks!

Kellen

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On Thu, Jan 10, 2019 at 9:39 AM -0800, "JOHNSON Ian * OPRD" <lan.Johnson@oregon.gov> wrote:

Hello Kellen, John and I will complete the poll soon.

I am curious what the agenda would cover at this meeting. Are there specific issues or questions? We would like to be prepared.

Thanks.

Ian



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**Idaho Power's Response to Reviewing Agency Comments
 Exhibit S – Cultural Resources
 Boardman to Hemingway Transmission Line Project
 January 14, 2019**

**Oregon Department of Energy
 Requests for Additional Information for the ASC Exhibit S - Historic, Cultural, and Archaeological Resources
 Received November9 (HRA) November13 (ODOE), and December 6 (SHPO), 2018**

Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
1	ODOE	Exhibit S	Attached is the draft “compliance review” memo that HRA/Golder sent to SHPO for its review. Please note that this is preliminary and the recommendations and comments that are submitted to ODOE by SHPO at a later date may differ. I’ve also attached an ODOE comment letter on the Revised Exhibit S that we sent on September 9, 2018. In it ODOE states; “The Department reiterates that resources on properties where IPC has gained site access shall be evaluated with proposed eligibility determinations and mitigation, if necessary, prior to issuance of the Draft Proposed Order (DPO). Based on the Council’s standard, it is not possible to defer the impact assessment and subsequent mitigation requirements (if any) to a pre-construction condition or otherwise defer to an ODOE staff determination.”	Noted. NRHP-eligibility evaluations have been recommended for all identified resources and the impacts of the Project on those resources assessed based on the recommended NRHP-eligibility recommendations. As discussed in Exhibit S, Section 3.4.1, resources that could not yet be properly evaluated are recommended as unevaluated but are treated as NRHP-eligible for the purposes of analysis. IPC understands this comment to have been resolved through communications with ODOE (12/3/18 conference call).

Oregon Department of Energy
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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
2	ODOE	Exhibit S	<p>Additionally, Page 25 of Attachment S-9 (HPMP) of Exhibit S states, "The appropriate mitigation measure(s) depends on a number of factors, including the applicable criteria for NRHP eligibility and significance to a tribe(s). Following the identification of impacts and the development of appropriate mitigation measures, resource specific mitigation plans will be prepared and included as Appendix B to this HPMP." Appendix B states that it is "To Be Determined".</p>	<p>Yes, resource-specific mitigation plans are to be determined. However, the generalized category of mitigation (data recovery, further research/testing, public interpretation, etc.) is identified for each resource in the respective survey reports and in the main body of Exhibit S. As noted in the HPMP, a resource-specific mitigation plan (such as specific locations for excavation units and research designs) for each resource impacted by the final design will be included in Appendix B of a revised draft HPMP, developed in consultation with reviewing agencies and affected tribes.</p> <p>As agreed upon by IPC and ODOE on the 12/3/18 conference call, the draft HPMP will be updated via an errata to include additional detailing of actions typically included in the generalized mitigation categories, as well as a listing of which resources are proposed to be mitigated by those actions.</p>
3	ODOE	Exhibit S	<p>Does IPC have an estimated timeline for the resource-specific Mitigation Plans (Appendix B)? This information will also need to be reviewed by SHPO (and potentially HRA).</p>	<p>See above.</p>

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4	ODOE	Exhibit S	<p>Based on IPC's estimated timeline for this, I think we should have a call to begin outlining the process to add information to the ASC, post completeness determination. I'd like to start planning for what information is expected to be included, how it should be submitted to ODOE and tracked with the existing ASC. OAR 345-015-0190 (9) states,</p> <p>“After a determination that an application is complete, the applicant shall submit additional information to the Department if the Department identifies a need for that information during its review of the application. Submission of such information does not constitute an amendment of the application.”</p>	<p>Noted. IPC understands this comment to have been resolved through communications with ODOE (12/3/18 conference call).</p>
4	HRA	Exhibit S	<p>Precontact Archaeological Sites. In general, nearly all of the site evaluations were updated based on concerns provided during the completeness review. Most precontact sites were recommended eligible or unevaluated; a few precontact sites were recommended not eligible due to the lack of potential for buried deposits as evidenced by the presence of bedrock and/or the lack of evidence for soil development. Two precontact sites did not follow this pattern: Sites 2B2H-SA-16 and 2B2H-SA-17 were recommended not eligible, but neither description fully addressed a lack of potential for soil development. For Site 2B2H-SA-16, an erosional area within the site boundary was mentioned, but there was no indication that it occupied a significant portion of the site and precluded the possibility of any buried materials being present. Site 2B2H-SA-17 was determined to be on a stable dune, but there was no discussion of whether soil development of any kind could have obscured artifact exposure. Clarification of the potential for buried deposits at these sites is needed to confirm that they are not eligible.</p>	<p>The NRHP-eligibility evaluations and the associated site descriptions for 2B2H-SA-16 and 2B2H-SA-17 will be reviewed and revised as necessary.</p>

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
6	HRA	Exhibit S	<p>Historic Archaeological Sites. Most historical archaeological site evaluations contained adequate reasoning for their NRHP evaluations; however, three historical sites (6B2H-SA-12, 6B2H-SA-16, and 35UN0326) were recommended not eligible, but the research did not support the archaeological data, leaving questions as to the specific origin of the archaeological remains. In these three instances, the evaluations do not specifically address these data gaps. The sites may not retain sufficient integrity or may be unlikely to contain additional archaeological information, but these issues are not explored, and the lack of subsurface archaeological examination creates doubt as to whether additional information could be present. When the historical research does not adequately explain the archaeological data, additional exploration of whether the data could meet the NRHP criteria independent of their specific context should be included to fully explore the resource's eligibility.</p>	<p>The NRHP-eligibility evaluations and the associated site descriptions for 6B2H-SA-12, 6B2H-SA-16, and 35UN0326 will be reviewed and revised as necessary.</p>

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7	HRA	Exhibit S	<p>Aboveground (Architectural) Resources. Reconnaissance-level survey (RLS) inventories were not updated in the OHSD to include the requisite minimum information (i.e., two photos, maps). Certain intensive-level survey (ILS) resources were recorded as sites instead of buildings or structures, which is inconsistent with both NRHP and SHPO guidance on cultural resource reporting; such instances are likely typographical errors remaining from previous reporting but should be clarified. The Visual Assessment of Historic Properties (VAHP) forms are inconsistently used for evaluation of potential impacts. Contributing and noncontributing resource counts are still in error on certain forms.</p>	<p>The RLS was updated on several occasions between 2012 and 2016. Following a review of the RLS data on February 18, 2014, the Oregon SHPO commented that “all properties, regardless of evaluation status, must include at least one photo, which must display on the accompanying printouts.” Also, in some instances, the RLS was not revised for resources located in the Baker City and LaGrande as the SHPO noted that “Based on the information provided to date [2014], the Oregon SHPO is satisfied that historic properties located in urban areas, such as within or surrounding large communities of Baker City, Ontario, and LaGrande, or that are physically separated from the B2H project by an interstate highway or other significant visual interruption are unlikely to be adversely affected by the B2H project. No further assessment is needed in these cases...” The RLS has previously addressed this request. The maps for the RLS were likewise submitted with the previous 2016 report and will be added to the database RLS grouping information.</p> <p>The ILS resources recorded as sites will be recorded as structures, buildings, or districts as applicable. The VAHP forms will be reviewed for consistency. Forms will be reviewed to ensure contributing/non-contributing resources are properly accounted for.</p>

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
8	HRA	Exhibit S Archaeological Resources:	Despite outstanding errors and omissions, HRA feels that IPC provided sufficient information for SHPO to move forward with determinations of eligibility of resources. HRA recommends SHPO make determinations of eligibility that concur with Tetra Tech's recommendations, with the following minimal exceptions: Site 2B2H-SA-16: Table S-2 recommends the site not eligible, but it is unclear if the erosional area within the site boundary occupied a significant portion of the site and precludes the possibility of buried materials being present. HRA recommends the site Undetermined pending additional studies. Note that this resource is located on federal lands, and the federal agency should be consulted regarding resource determinations	As stated above in response to Question #4, the NRHP-eligibility evaluation and the associated site description for 2B2H-SA-16 will be reviewed and revised as necessary.
9	HRA	Exhibit S	Site 2B2H-SA-17: Table S-2 recommends the site not eligible, but the site's location on a stable dune may yield additional information. HRA recommends the site Undetermined pending additional studies. Note that this resource is located on federal lands, and the federal agency should be consulted regarding resource determinations	As stated above in response to Question #4, the NRHP-eligibility evaluation and the associated site description for 2B2H-SA-17 will be reviewed and revised as necessary.
10	HRA	Exhibit S	Site 6B2H-SA-12: Table S-2 recommends the site not eligible, but data gaps remain. HRA recommends the site Undetermined pending additional studies. This site is located on private lands.	As stated above in response to Question #6, the NRHP-eligibility evaluation and the associated site description for 6B2H-SA-12 will be reviewed and revised as necessary.
11	HRA	Exhibit S	Site 6B2H-SA-16: Table S-2 recommends the site not eligible, but data gaps remain. HRA recommends the site Undetermined pending additional studies. This site is located on private lands.	As stated above in response to Question #6, the NRHP-eligibility evaluation and the associated site description for 6B2H-SA-16 will be reviewed and revised as necessary.
12	HRA	Exhibit S	Site 35UN0326: Table S-2 recommends the site not eligible, but data gaps remain. HRA recommends the site Undetermined pending additional studies. This site is located on private lands.	As stated above in response to Question #6, the NRHP-eligibility evaluation and the associated site description for 35UN0326 will be reviewed and revised as necessary.

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
12	HRA	Exhibit S Architectural (Above-ground) Resources:	71863 Wilson Lane: Table S-2 recommends the resource not eligible, but the resource is noted as eligible in the OHSD at a reconnaissance-level (specifically, a barn and silo. An associated house and mobile homes were assessed as not eligible). Exhibit S-7 (RLS), Appendix C notes the resource required an intensive-level survey and, though it is mentioned in Exhibit S-10 (ILS) as being not eligible, there is no associated site form in either Exhibit S-10 or OHSD. HRA recommends the resource Undetermined pending additional studies; however, according to Table S-2, the resource will not be impacted by the Project, so no additional work may be necessary at this time.	Idaho Power will prepare a form for the resource located at 71863 Wilson Lane.
13	HRA	Exhibit S HPMP	To that end, HPMP Section 3.1, Preconstruction tasks, should include bullet points for resolving the NRHP eligibility of unevaluated resources and assessing project effects to NRHP eligible resources, archaeological sites and archaeological objects, with specific reference to Sections 5.1 and 5.2 of the HPMP. This will clarify that these steps are needed prior to construction. Otherwise, HRA recommends the HPMP is adequate to address the EFSC statute. SHPO may wish to request that the HPMP be updated to include a comprehensive list of known historic properties and other cultural or archaeological resources in the Project Analysis Area, though this information may be better contained in a confidential Appendix that also includes current, anticipated, and completed project actions and/or needed cultural resource studies, as appropriate.	Section 3.1 of the draft HPMP will be updated as requested via an errata sheet, as agreed to by ODOE.

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
14	SHPO	Exhibit S	<p>Many resources are misidentified in terms of resource type. Many are identified as "sites" that are actually structures, or built linear resources, but others are well. These should be properly identified according to the National Park Service standards.</p>	<p>The property types discussed in the exhibit will be reviewed to ensure consistency with the National Register bulletins. Please provide a list of specific resources where this is a concern. Terminology in Exhibit S is consistent with the terminology used in EFSC siting standards and ODOE regulations, which refer to archaeological sites, archaeological objects, and resources listed on or eligible for listing on the NRHP (historic properties). Thus, "sites" was used in this document. Project 106 documents (as well as the text in the survey reports attached to Exhibit S) use the NPS terminology in site descriptions and NRHP eligibility evaluations. Identification of sites and objects is also consistent with SHPO/HRA comments received during previous reviews of the application.</p>
15	SHPO	Exhibit S	<p>Lack of information regarding the history of a resource should never be used to recommend that a resource does not meet a significance criterion. For example, the resource "Road to Rye Valley" evaluation includes the following statements: "It is unclear who created the road. Therefore, the road does not appear to be associated with a person who played a significant role in our nation's history (Criterion B). The road has been modernized and there is no indication of what the road looked like originally. Therefore, the road no longer embodies the distinctive characteristics of an architectural style or architect or exhibit high artistic value, if it ever did (Criterion C)." No bibliographic materials are identified on the form. These indicate that further research should be done, rather than assuming that no significance exists.</p>	<p>The sources listed in Att. S-6 (see Section 6.2.4 and resource-specific evaluations in Chapter 8) were consulted as appropriate for each evaluated resource. If no information could be found, then there is nothing else to cite. A resource's lack of discussion/documentation in the historical record is indicative of a lack of significance. In addition to those sources that were cited in the text for this resource, Idaho Power will provide the additional sources consulted that didn't contain relevant information.</p> <p>Please provide a list of specific resources where this is a concern.</p>

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
16	SHPO	Exhibit S Built Environment	As noted in the Oregon Linear Resources Guidance, irrigation delivery ditches such as that (apparently) identified as "Unnamed Water Conveyance System" (4B2H-EK-44) should be evaluated within the context of the agricultural unit to which it delivers water (usually fields associated with a ranch or farmstead), not in a vacuum. To that end, evaluations of such resources should include identification of the agricultural unit with which it is associated, and analysis of that farmstead or ranch should inform the evaluation of the irrigation system. If the ditch is actually a lateral or sublateral of a larger irrigation system (i.e., it delivers water to more than one farm), then the MPD that applies to those systems should guide evaluation (see comment regarding Vale Oregon Irrigation District below).	Irrigation ditches will be reviewed to confirm their context in any larger system and their place within the larger historical landscape. Please provide a list of specific resources where this is a concern.
17	SHPO	Exhibit S Built Environment	Oregon SHPO does not concur with some of the recommendations of eligibility submitted. Several of the resources are identified as "unevaluated", or their eligibility is "undetermined". Our office does not leave historic, built resources that appear in project Areas of Potential Effect (APE) unevaluated, as this does not resolve the questions required by the project regulatory review process, namely, "Is the resource eligible for listing in the National Register of Historic Places (NRHP)", and "Will the project adversely affect any eligible resources?" Resources seeking consensus determinations should default to eligibility until such time as application of all four NRHP criteria for eligibility and the aspects of integrity are made. If no adverse effects are anticipated, regardless of eligibility, but eligibility is not fully explored, the resources should be left as "eligible" until non-eligibility is sufficiently supported by data and analyses.	Evaluations will be reviewed for consistency. As the evaluation of resources is a part of the Programmatic Agreement concurrence from the SHPO would not be required at this point, but rather when the BLM (or applicable federal agency) makes the eligibility determination and then requests the SHPO's concurrence. All four NRHP criteria were applied to a majority of resources where their significance (or lack thereof) was readily apparent. For other resources, such as cairns, the resources were typically classified as unevaluated because their significance is not known, but they were considered eligible by the project team in order to complete the effects analysis. See Exhibit S, Section 3.4.1.

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Comment #	Reviewing Agency	ASC Reference	Comment or Request for Additional Information	Response
18	SHPO	Exhibit S Built Environment	As noted by HRA, Inc., 71863 Wilson Lane does not have a submitted evaluation form. This form must be completed and provided in order for our office to provide concurrence. In the meantime, the resource should be evaluated as "eligible".	IPC will prepare a form for the resource located at 71863 Wilson Lane.
19	SHPO	Exhibit S Built Environment	All segments of the Oregon Trail that occur within the APE, including the Meek Cutoff, should be evaluated through the Oregon Trail Multiple Property Document, currently in draft, but expected to be finalized in the coming months.	All segments of the Oregon Trail that occur within the APE, including the Meek Cutoff, were evaluated using the latest (2015) post-SACHP version of the Oregon Trail, Oregon, 1840-1880 MPDF (Beckham 2015). As noted on page 3 of the Meek Cutoff form, for instance, the text reads "The historical segment of the Meek Cutoff is within the study's analysis area but does not appear to be visible. As a trail segment, the portion of the Meek Cutoff within the project area does not appear to meet the registration requirements of the Intersecting Routes property type as contained in the Oregon Trail, Oregon, 1840-1880 MPDF." It should be noted that the MPDF has been in draft form for over 6 years and has not yet been accepted by the Keeper of the National Register.
20	SHPO	Exhibit S Built Environment	Linear resources (canals, laterals, roads, trails, railroads, etc.) should be evaluated with reference to the Oregon Linear Resources Guidance document, available on the SHPO website. All linear resource evaluation forms should reference this document explicitly.	Comment noted. Reference will be added as applicable. Please clarify if this comment is regarding site forms only and, if so, should it be done on both built environment and archaeological forms?

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21	SHPO	Exhibit S Built Environment	All Intensive Level survey documentation/evaluation forms must include a bibliography. Many do not.	<p>IPC will revise the following forms to address the concern: OR&N Heppner Branch; OWR&N/UPRR Coyote Cut-off; 4B2H-EK-04; 6B2H-TH-03 USGS Survey Marker; B2H-BA-178 refers the reader to the National Register nomination.; Road to Rye Valley (6B2H-SA-08); 3B2H-SA-16 (more); 4B2H-EK-19; Banks Ditch; B2H-JF-14; Stone Survey Marker near Farewell Bend (4B2H-EK-35); Warm Springs Pump Canal (4B2H-EK-43); Take out page 453; South Canal (B2H-SA-10); Unnamed Water Conveyance System (4B2H-EK-44).</p> <p>Please confirm forms of concern are limited to the above list.</p>

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22	SHPO	Exhibit S Built Environment	All elements of the Vale Oregon Irrigation District should be evaluated according to the Multiple Property Document "Carey and Reclamation Acts Irrigation Projects in Oregon, 1901-1978", available from our website or that of the National Park Service. This MPD has been registered with the Keeper of the National Register.	<p>Those elements of the Vale Oregon Irrigation District identified in the APE were evaluated according to the Multiple Property Document "Carey and Reclamation Acts Irrigation Projects in Oregon, 1901-1978." On the form for B2H-MA-001 Vale Irrigation Project Canal, for instance, page 2 reads</p> <p style="padding-left: 40px;"><i>"The Vale Irrigation Project Canal retains all aspects of integrity (location, design, materials, setting, feeling, association, and workmanship). It meets the registration requirements outlined in the Carey and Reclamation Acts Irrigation Projects in Oregon, 1901-1978 MPDF as the canal maintains sufficient integrity and is long enough to represent its original function and demonstrate its functional relationship and connectivity to other contributing elements."</i></p> <p>Other resources evaluated under the Carey and Reclamation Acts MPDF include B2H-MA-043, B2H-MO-047, 126CSF-12, B2H-SA-01, B2H-MA-001, and B2H-MA-044.</p>

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23	SHPO	Exhibit S Built Environment	<p>The resource "Building" (B2H-MA-008) includes in the evaluation the following statement, "The resource's physical characteristics are aboveground and visible, and existing documentary sources discuss little to no significant information about the property. It therefore holds little to no potential to yield information significant to the past and therefore is recommended as not eligible under NRHP Criterion D." This statement appears to suggest that a standing building cannot be eligible under Criterion D, which is not accurate, especially with reference to vernacular architecture, which this building may represent. The fact that little information about it exists in the documentary record does not address the possibility that it could, in fact, provide important information that does not occur in the documentary record, which is in large part the point of Criterion D. While the evaluation of the building as not eligible may be adequately supported by analysis of integrity, the use of the above phrasing is not suitable. Alternatively, if no adverse effect is likely, consensus determination of "eligible" could be made at this time, with no further work required for this project.</p>	<p>Built environment resources can be eligible under Criterion D; however, all we are saying here is that the resource B2H-MA-008 has all of its characteristics readily evident, therefore it does not have the potential to convey information significant to our past.</p>
24	SHPO	Exhibit S Built Environment	<p>If the abandoned irrigation ditch identified as "B2H-MA-043" has been abandoned for 75 years (under state law) or 50 years (under federal law), then the resource should be reported and recorded as an archaeological site.</p>	<p>As noted in the exhibit and survey report attachments, the approach utilized for the Project was limited to federal regulations, which require a resource to be 50 years old. For the purposes of consistency between the two processes, this approach was agreed to by consulting parties to the PA, including ODOE.</p>

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25	SHPO	Exhibit S Archaeology	<p>Statements such as "a few precontact sites were recommended not eligible due to the lack of potential for buried deposits..." suggests evaluations only considered Criterion D, and further, that important research questions can only be addressed if buried deposits exist. In the same paragraph, it states: "Clarification of the potential for buried deposits at these sites is needed to confirm that they are not eligible". Please note, evaluations must address all four criteria, whether they are archaeological sites, built structures, properties of religious and cultural significance to an Indian tribe, or traditional cultural properties. In addition, important research questions do not only address buried deposits, or intact deposits for that matter. Guidance on NRHP evaluations with examples for each criterion is in NR Bulletin 15. Regarding archaeological sites, according to NR Bulletin 16A, "the integrity of archaeological resources is generally based on the degree to which remaining evidence can provide important information. All seven qualities do not need to be present for eligibility as long as the overall sense of past time and place is evident". To meet the EFSC standard of whether an archaeological site would likely be listed in the NRHP, all four criteria must be addressed, and applied accordingly.</p>	<p>In Att. S-6, all resources (archaeology and built environment) are evaluated under all four NRHP eligibility criteria, consistent with the described methodology and previous comments received from SHPO/HRA and CTUIR during earlier reviews. The quoted HRA comment from their 11/9/18 memo to SHPO and ODOE is specific to the archaeological sites listed in their comment. These two NRHP-eligibility evaluations and the associated site descriptions will be reviewed and revised as necessary.</p>

TARDAEWETHER Kellen * ODOE

From: English, Aaron <Aaron.English@tetrattech.com>
Sent: Friday, April 12, 2019 9:19 AM
To: TARDAEWETHER Kellen * ODOE
Cc: mstokes@idahopower.com
Subject: IPC Response to Agency Comments
Attachments: 2019-03-20 - B2HAPP ASC_ODOE RAI_Exhibit AA (002).pdf; B2HAPP ASC Reviewing Agency Comment DSL_Cary 2019-01-28.pdf; B2HAPP ASC Reviewing Agency_ODFW Comment_Response 01.25.19.pdf; B2HAPP ASC_ODOE RAI_Exhibit U.pdf; B2HAPP ASC_ODOE RAI_Exhibit U_V2.pdf; B2HAPP ASC_ODOE RAI_Exhibit W.pdf

Kellen,

Attached are IPC's responses to ODOE and other agency comments on the ASC. All of these comments were addressed where applicable in the errata previously provided to you.

Let me know if you any questions.

Aaron English | Project Manager/NEPA Specialist
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Comments and RAI's included in the comment bubbles.

DRAFT Section Portions of IV.P. Division 24 Standards

Electric Fields

The electric charge (measured as voltage) on an energized transmission line conductor produces electric fields. The greater the overall transmission line voltage, the greater the strength of the electric field. In contrast, the amount of current flowing on the conductor, which fluctuates daily and seasonally with changes in electricity usage, does not impact the strength of electric fields produced by the conductor. Electric fields diminish in strength proportional to distance from the transmission line conductors (the greater the distance from the conductors, the lower the electric fields), and are weakened or blocked by conductive objects (such as trees or buildings).¹

The applicant used a model developed by the Electric Power Research Institute² (which utilizes a methodology developed by the Bonneville Power Administration) to calculate the electric fields, measured in units of kilovolts per meter (kV/m), which would be produced by the proposed new 500 kV transmission line, rebuilt 230-kV transmission line, and rebuilt 138-kV transmission line. The model considered the following line geometries that the applicant expects to use in Oregon:

- 500-kV transmission line on a single-circuit lattice tower (delta configuration; ASC Exhibit B, Figure B-15) with a minimum ground clearance of 34.5 feet
- 230-kV transmission line on a single-circuit H-frame structure (horizontal configuration; ASC Exhibit B, Figure B-19) with a minimum ground clearance of 20 feet
- 138-kV transmission line on a single-circuit H-frame structure (horizontal configuration; ASC Exhibit B, Figure B-20) with a minimum ground clearance of 20 feet

In addition, the applicant modeled the electric fields from one alternative geometry that would be used when unique siting concerns require the use of special structures:

- 500-kV transmission line on a single-circuit H-frame or Y-frame structure (horizontal configuration; see ASC Exhibit B, Figures B-16 and B-17) with a minimum ground clearance of 34.5 feet

The model used the nominal voltage of the 230-kV and 138-kV transmission lines, but evaluated a more conservative (higher) voltage of 550-kV for the 500-kV transmission line to account for overvoltage situations. The model provided the predicted electric field levels out to distances of 200 feet on either side of each proposed transmission line structure type. Table X-X, reproduced from ASC Exhibit DD, Table DD-1, summarizes the electric field strengths at the

Commented [KT1]: This doesn't take into account that the amount of current flowing on the conductor leads to greater line sag, therefore bringing the same amount of electric fields closer to the ground (meaning, the receptor thereby experiences higher electric fields, because the closer to the source, the higher the electric field experienced).

Commented [IPC2R1]: The highlighted sentence is accurate. However, we understand ODOE's concern to be that the reference to "normal operating conditions" in Condition 1 suggests there are non-normal operating conditions where the transmission line may sag below the minimum ground clearances set forth in that condition and thus it may not meet the 9 kV/m at 1 meter above ground surface standard during those non-normal operating conditions. To address that concern and to clarify Idaho Power's intent that it will design and construct the transmission line to comply with the ground clearances set forth in Condition 1 **under all conditions**, therefore, ensuring compliance with the 9 kV/m standard, Idaho Power proposes the following edits to Condition 1:

Siting Standard Condition 1: During construction, the certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields:

-
- b. Constructing all aboveground 500 kV transmission lines with a minimum clearance of 34.5 feet from the ground **at normal-under all** operating conditions;
- c. Constructing all aboveground 230 kV transmission lines with a minimum clearance of 20 feet from the ground **at normal-under all** operating conditions;
- d. Constructing all aboveground 138 kV transmission lines with a minimum clearance of 20 feet from the ground **at normal-under all** operating conditions;
-

Commented [KT3]: See footnote below for circumstances/conditions where maximum line sag may occur.

Commented [IPC4R3]: See response above clarifying that the transmission line will be designed and constructed to meet minimum ground clearances under all operating conditions and not just normal operating conditions.

¹ B2HAPPDoc3-44 ASC 27_ Exhibit AA_EMF_ASC 2018-09-28, Section 3.2.1.
² The model is EMFWorkstation: ENVIRO (Version 3.52).

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peak and edge of the ROW for each of these transmission line configurations. The 500-kV single-circuit lattice tower configuration would produce the highest electric fields. As shown in Table X-X, the maximum electric field modeled is 8.9 kV/m at one meter above the ground. This value is slightly below the limit for electric fields from transmission lines (set at OAR 345-024-0090(1)) of not more than 9 kV per meter at 1 meter above the ground surface in areas that are accessible to the public.

Table X-X: Electric Field Strength for Each Considered Structural Configuration

Structure Type	ROW Width (feet)	South/West ROW Edge (kV/m)	Maximum within ROW (kV/m)	North/East ROW Edge (kV/m)
500-kV lattice	250	0.8	8.9	0.8
500-kV tubular steel H-frame and Y-frame monopole	250	0.9	8.8	0.9
230-kV wood H-frame	125	0.8	5.0	0.8
138-kV wood H-frame	100	0.5	2.3	0.5

Electric field strength calculated at standard height of one meter above ground surface.
 kV/m = kilovolt per meter; ROW = right-of-way

The applicant's position is that post-construction monitoring of electric fields is unnecessary because the modeling results assumed worst-case conditions of line overvoltage and minimum ground clearance, and those conservative calculations show that the electric fields would be slightly below the threshold established at OAR 345-024-0090(1).³ As previously stated, the applicant's modeling exercise assumed a minimum conductor ground clearance of 34.5 feet. The applicant requests a site certificate condition establishing a minimum clearance for the 500-kV transmission line conductors of 34.5 feet from the ground "at normal operating conditions."⁴ However, such a condition would allow a lesser minimum conductor clearance when the line is operating outside of normal operating conditions, such as at maximum line sag.⁵ Because the model shows that maximum electric fields that would be produced by the 500-kV lattice single-circuit lattice tower configuration is 8.9 kV/meter at one meter above the ground when the line is modeled at 34.5 feet from the ground, a lesser minimum conductor clearance could result in electric fields that exceed 9 kV/m at 1 meter above the ground. Therefore, the Department recommends that the Council adopt the following condition requiring that the certificate holder design and construct the 500-kV transmission line with a minimum ground clearance of 34.5 feet **under all conditions**:

Commented [KT5]: The modeling assumed overloading and minimum clearance but did not take into account similar circumstances in addition to hot temperatures as well as when lines cross.

Commented [IPC6R5]: See response above clarifying that the transmission line will be designed and constructed to meet minimum ground clearances under all operating conditions and not just normal operating conditions.

³ B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.8.

⁴ B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.7.

⁵ On hot days and when a transmission line is heavily loaded (e.g., on summer days when demand for electricity to run air conditioners is high), the conductor heats and expands, causing the line to sag closer to the ground.

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Recommended Siting Standards for Transmission Lines Condition 1: To reduce or manage human exposure to electromagnetic fields, the certificate holder shall design and construct:

- a. All aboveground 500-kV transmission lines such that a minimum clearance of 34.5 feet from the ground is maintained **under all conditions**;
- b. All aboveground 230-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions; and
- c. All aboveground 138-kV transmission lines with a minimum clearance of 20 feet from the ground at normal operating conditions.

In areas where an existing transmission line would parallel a proposed transmission line, the electric fields within the transmission line ROW may increase or decrease depending on the proximity, load, and phasing of the parallel line.⁶ Therefore, in addition to modeling the electric fields that would be produced by each transmission line alone, the applicant also modeled the interactions between the electric fields that would be produced by the 500-kV lattice structures and the electric fields that would be produced by parallel transmission lines.⁷ ASC Exhibit AA, Figure AA-9 shows that existing parallel lines located near the proposed 500-kV corridors will not result in exceedances of 9 kV/m at 1 meter above the ground surface, in compliance with OAR 345-024-0090(1). The proposed 500-kV transmission line has the potential to exceed this threshold, however, where the line would cross (rather than parallel) existing transmission lines.

[applicant representations and conditions]

Induced Voltage and Current

The Siting Standards for Transmission Lines requires the Council to find that the applicant “can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.”

As explained in ASC Exhibit DD, the flow of electricity in a transmission line can induce a small electric charge, or voltage, in nearby conductive objects, such as metallic objects (e.g., vehicles, equipment, metal fences, signs, and metallic roofs). An induced electric charge can flow, or

⁶ A single-circuit transmission line carries one phase in each of its three conductors. The voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of the 360 degree cycle. The fields from these conductors tend to cancel out because of this phase difference. Therefore, depending on the geometry and arrangement of the conductors in the parallel transmission line, a parallel transmission line can either increase or decrease the electric fields within the transmission line ROW. B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.2.1.

⁷ The 500-kV lattice configuration would produce the highest electric fields; therefore, the applicant modeled the interaction of electric fields from parallel transmission lines with the electric fields from this transmission line configuration. B2HAPPDoc3-44 ASC 27_Exhibit AA_EMF_ASC 2018-09-28, Section 3.5.3.

Commented [KT7]: The proposed 500-kV transmission line has the likely potential to exceed the 9 kV/m at 1 m above the ground threshold where the line would cross (rather than parallel) existing transmission lines. How does IPC plan to design, engineer, construct and operate the transmission line to avoid an exceedance (out of compliance with the standard) at crossings.

Commented [IPC8R7]: Idaho Power disagrees with the suggestion that the transmission line will exceed the 9 kV/m at 1 meter above ground surface standard at crossings. Exhibit AA, Section 3.5.3 makes it clear that Idaho Power will design the crossings so that the heights and separation clearances ensure the 9 kV/m at 1 meter above ground surface standard is met: “In areas where crossings occur, the vertical transmission line height and separation will be selected during detailed design in a manner to maintain electric fields in the area of the crossing below the 9 kV/m standard.” Condition 1 also ensures that Idaho Power will design the crossing heights and separation clearances to meet that standard:

Siting Standard Condition 1: During construction, the certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields:

-
- e. In areas where aboveground transmission line will cross an existing transmission line, constructing the transmission line at a height and separation ensuring that alternating current electric fields do not exceed 9-kV per meter at one meter above the ground surface; and
-

Commented [KC9]: The applicant’s current proposed condition is:

During construction, the certificate holder shall take the following steps to reduce or manage human exposure to electromagnetic fields:

-
- In areas where aboveground transmission line will cross an existing transmission line, constructing the transmission line at a height and separation ensuring that alternating current electric fields do not exceed 9-kV per meter at one meter above the ground surface
-

Commented [IPC10R9]: The proposed transmission line will be designed so that the 9kV per meter electrical field strength at one meter above the ground will not be exceeded under any/all operating conditions. This includes maximum load conditions, maximum sag conditions, and locations where the line crosses or is adjacent to other transmission lines.

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become electric current, when a path to ground is presented. For example, a vehicle that is insulated from grounding by its tires and is parked under a transmission line long enough to build up a charge can cause humans that touch the vehicle to experience a momentary shock as the person becomes the conducting path for the current to flow to ground. A person can generally notice induced current if the available electrical charge is greater than 1 milliampere (mA), and at 5 mA most children (99.5 percent) are able to still let go of an electrified object.⁸ The National Electric Safety Code (NESC) sets a performance standard at Rule 234G.3 limiting the steady-state current due to electrostatic effects to 5 mA.

The strength of the induced current in an object is positively related to the electric field strength of a nearby transmission line. The applicant therefore calculated the induced current expected to result for various objects located near the 500-kV lattice configuration, because this configuration would produce the strongest electric fields. Table X-X below, reproduced from Table DD-2 of ASC Exhibit DD, shows the maximum current that could be induced in several types of vehicles and agricultural equipment if those objects were located in the transmission line ROW. The maximum induced current is calculated by multiplying the factors in the middle column (derived from an Electric Power Research Institute publication) by the maximum expected electric field strength from the proposed facility (under normal operating conditions). As shown in Table X-X, cars, pickup trucks, and combines located within the ROW of the 500-kV lattice transmission line configuration would build up an inducible charge that would be less than the 5-mA threshold established by the NESC. If a large tractor-semitrailer were located parallel to and directly under the transmission line, it would have the potential to build up an inducible charge that would exceed the 5-mA threshold. However, the applicant explains that tractor-semitrailers are unlikely to drive directly under and parallel to the line; tractor-semitrailers may briefly cross under the line where the transmission line crosses a road, but in these circumstances the tractor-semitrailer would be under the transmission line for only a short duration and would not be parallel to the line. If the transmission line crossed a location where tractor-semitrailers may be parked long enough to build up an inducible charge (such as at a gas station or a parking lot), the resulting induced current may exceed the 5-mA threshold; therefore, the applicant represents that at these locations it would alter the transmission line design if necessary to ensure that the line complies with the 5-mA threshold established by the NESC.

Table X-X: Induced Current Factors

Object	Isc/E (mA/kV/m)	Maximum Induced Current (mA) ¹
Car—L 4.6 m x W 1.78 m x H 1.37 m	0.088	0.78
Pickup Truck—L 5.2 m x W 2.0 m x H 1.7m	0.10	0.89
Large Tractor-Trailer—Total Length 15.75 m Trailer: 12.2 m x W 2.4 m x H 3.7 m	0.64	5.70
Combine—L 9.15 m x W 2.3 m x H 3.5 m	0.38	3.38
Source: Table 7-8.2, EPRI AC Transmission Line Reference Book: 200 kV and Above (EPRI 2005)		

⁸ B2HAPPDoc3-47 ASC 30_ Exhibit DD_Specific Standards_ASC 2018-09-28, Section 3.4.1.

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¹ Maximum induced current calculated for strongest predicted electric field of 8.9 kV/m, associated with the proposed lattice segment.
 I_{sc} = short-circuit current E = AC electric field
 m = meter

To reduce the risk of induced current and nuisance shocks, the applicant proposes to inform landowners of the risks of induced current, develop and implement a program to ground or bond conductive objects or structures that could become charged by the electric fields from the transmission line, and to follow NESC grounding requirements. The applicant therefore proposes, and the Department recommends, that the Council impose the following site certificate condition:

Recommended Siting Standards for Transmission Lines Condition 2: Prior to placing the facility in service, the certificate holder shall take the following steps to reduce the risk of induced current and nuisance shocks:

- a. Provide to landowners a map of overhead transmission lines on their property and advise landowners of possible health and safety risks from induced currents caused by electric and magnetic fields.
- b. Develop and implement a program that provides reasonable assurance that all fences, gates, cattle guards, trailers, irrigation systems, or other objects or structures of a permanent nature that could become inadvertently charged with electricity are grounded or bonded throughout the life of the line.
- c. Implement a safety protocol to ensure adherence to National Electric Safety Code grounding requirements.

In addition, the applicant states that IPC would design, construct, and operate the facility in accordance with the version of the NESC that is most current at the time final engineering of the facility is completed. The applicant proposes and the Department recommends that the Council adopt the following condition:

Recommended Siting Standards for Transmission Lines Condition 3: The certificate holder shall design, construct, and operate the transmission line in accordance with the requirements of the version of the National Electrical Safety Code that is most current at the time that final engineering of the facility is completed.

Like the proposed transmission lines (the new 500 kV transmission line, rebuilt 230-kV transmission line, and rebuilt 138-kV transmission line), the Longhorn Station and communication stations have the potential to generate induced currents in nearby conductive objects. To reduce the risk of induced current and nuisance shocks from the Longhorn Station and communication stations, the applicant proposes to....[fill in once we receive more information from the IPC].

Commented [KT11]: EFSC Site Specific Conditions [OAR 345-025-0010] has an out-of date NESC reference. This is a draft condition ODOE is considering to replace or use in conjunction with the site-specific condition.

Commented [IPC12R11]: Idaho Power agrees with this proposed language referencing the NESC that is operative at the time of final design.

Commented [KT13]: The standard states: *Can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.*

Exhibit DD says, "Longhorn Station and communication stations will be constructed in a manner to minimize induced currents in surrounding facilities" but doesn't provide any specifics.

Please explain how the Longhorn Station and communication stations would be constructed (e.g., with a grounding mat) to minimize induced currents in nearby conductive objects.

Commented [IPC14R13]: To reduce the risk of induced current and nuisance shocks from the Longhorn Station and communication stations, Idaho Power will design those facilities to include such features as grounding, bonding, shielding, and physical barriers such as fencing around the stations. Idaho Power will also employ signage to deter trespass and employee training to eliminate or manage shock hazards that might be experienced inside the fence.

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[consider recommending a condition related to grounding the substation and communication stations]

Commented [IPC15]: Requiring specific grounding features beyond what already might be required by NESC is unnecessary and unsupported by any evidence in the record, as NESC already requires that such facilities be sufficiently designed and constructed to protect against electrical shock hazards. The NESC requirements protect the public who might approach such facilities from the outside of stations or on the ROW of the transmission line. They also protect employees who would be inside the stations, or work on the transmission line. Therefore, no additional grounding requirements beyond the NESC condition are required.

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 1	Attachment U-1C	Attachment U-1C and page U-25		<p>ASC Exhibit U, Attachment U-1C provides correspondence with fire prevention agencies. The Oregon Department of Forestry and the Union County Emergency</p> <p>Services-Fire Department both expressed concerns about waiting times and delayed response times due to waiting for the transmission line to be de-energized. Page U-25 of Exhibit U states the ODF “Rangeland Coordinator expressed concern regarding the risk of fighting fires near energized transmission lines, because electricity could arc through the smoke and strike firefighters” However, this does not appear to be the concern of ODF described in Attachment U-1C.</p> <p>Please provide a description of the procedures that IPC would employ to de-energize the transmission lines in the event of an emergency? Please include how the operation/control center notify local emergency agencies, conversely how do local emergency agencies notify the control center of an emergency that necessitates shutting the transmission line down? What are the response times associated with de-energizing the line?</p>	<p>A contact number directly to Idaho Power’s 24/7 dispatch center will be provided to all necessary agencies for notification purposes. Upon being notified of a fire, Idaho Power dispatch will gather as much information as possible and immediately dispatches appropriate personnel to monitor the fire and/or coordinate with onsite emergency agencies.</p> <p>Once onsite, and if requested, Idaho Power personnel will confirm facilities to be removed from service for safety of fire personnel and communicates this back to Idaho Power dispatch. Idaho Power dispatch then removes the line from service, relaying that information to the Idaho Power onsite personnel, who in turn communicates the condition to onsite emergency agencies.</p> <p>Response time will vary, based on initial notification times to Idaho Power dispatch. Once onsite, Idaho Power personnel requesting a line outage for safety concerns can expect a line outage within a few minutes. The line would then be considered unavailable to return to service until onsite Idaho Power personnel are able to verify with onsite emergency agencies that all personnel and equipment are no longer in danger of electrical contact.</p>

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 2		Page U-25		<p>Page U-25 states, “Construction workers and maintenance personnel are not trained firefighters and are not expected to fight fires. However, qualified equipment operators, at the direction of Incident Command, may use construction equipment to assist local firefighting efforts when safe to do so.”</p> <p>What, who and where is Incident Command?</p>	<p>Text on Page U-25 is revised in the Exhibit U Errata to include the following text: In the event of a fire, the Incident Management Team may request local assistance in fire fighting if personnel have required training including the use construction equipment on the Project site.</p> <p>Incident management teams (IMT’s) respond to large wildfire incidents upon the request of the local jurisdiction in which the fire is burning. Teams are comprised of overhead personnel from single or multiple agencies to come in and relieve local resources on incidents that have exceeded their capacity. IMT’s order additional resources from local, regional and national systems based on the need of the incident. In many cases, IMT’s will order qualified local equipment operators and equipment to assist in the fire suppression effort. These operators must have basic fire suppression and safety training in order to join the fire suppression effort.</p>
				<p>Section 2.1.1 of the Fire Prevention and Suppression Plan states that “The Contractor and IPC will train all personnel on the measures to take in the event of a fire. The Contractor and IPC will immediately proceed to control and extinguish any fire started resulting from their activity.” Yet page U-25 states, “Construction and operations crews will implement the Fire Prevention and Suppression Plan, so that the Project will not increase the risk of fire. Construction workers and maintenance personnel are not trained firefighters and are not expected to fight fires...”</p>	<p>Text on Page U-25 is revised in the Exhibit U Errata deleting the following sentence:</p> <p>Construction workers and maintenance personnel are not trained firefighters and are not expected to fight fires</p>
				<p>What construction personnel are expected to use the equipment listed in Section 2.1.5 of the Fire Prevention and Suppression Plan? How will they be trained?</p>	<p>Construction personnel that have received firefighting training provided by one or more of the Interagency Firefighting Crew Agreement Region 6 Approved MOU Training Providers.</p>

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ASC RAI U- 3	Section 2.1.5	Attachment U-3	OAR 437-007-1315	<p>To reflect the requirements of OAR 437-007-1315 and in response to the comments from ODF, the revised Fire Prevention and Suppression Plan states that, “The firewatch... be qualified in the use and operation of assigned firefighting equipment and tools; be physically capable of performing assigned fire suppression activities; and be advised of single employee assignment responsibilities.... Each person providing fire watch service on an operation area must have adequate facilities for transportation and communication to be able to summon firefighting assistance in a timely manner.”</p> <p>Please describe during construction who will operate as the Firewatch? How will they be trained? How many personnel will receive this training? Which personnel will trained and authorized to operate the equipment listed in Section 2.1.5. See also RAI above.</p>	<p>During construction the construction contractor will provide staff to the position of Firewatch. Staff in the position of Firewatch will be trained to meet and implement the requirements of OAR 437-007-1315 and OAR 629-043-0030</p> <p>Training will be provided one or more of the Interagency Firefighting Crew Agreement Region 6 Approved MOU Training Providers. The construction contractor may also decide to hire a company that provides wildland fire fighting services including firewatch. Such company would meet the _____</p>
ASC RAI U- 4	Section 3.4.7 and 3.5.6.3	U-18 and U-26		<p>Page U-26 states “Workers suffering minor injuries will be treated at local medical facilities or emergency rooms. Workers suffering more serious injuries, were they to occur, will be taken to one of the major hospitals in the project vicinity.”</p> <p>Are the “local medical facilities” included in the 3 health care facilities listed in Exhibit U?</p>	<p>No only the major facilities/hospitals that have true emergency/trauma services are included.</p>
				<p>What are considered “minor injuries” that would require visitation to a medical facility?</p>	<p>Any injury requiring treatment by a licensed medical provider will require visitation to a medical facility.</p>
				<p>Will there be any first aid materials or facilities provided on-site?</p>	<p>Yes, first aid materials will be provided on-site during construction. The type and distribution of first aid materials on site will be included in the Environmental and Safety Training Plan. See Public Services Condition 4.</p>
				<p>Will any personnel be required to hold active First Aid and CPR certifications?</p>	<p>The need for personnel to hold active First Aid and CPR certifications will be included in the Environmental and Safety Training Plan. See Public Services Condition 4.</p>
				<p>How will workers suffering from a minor or serious injury be transported to a medical facility?</p>	<p>The method of transportation of injured workers to a medical facility will be decided in the field at the time of injury. The chosen method will be the method the provides the best care for the injured worker. A summary of methods of transportation of injured workers to a medical facility will be included in the Environmental and Safety Training Plan. See Public Services Condition 4.</p>

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Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI U- 4	Section 3.4.7 and 3.5.6.3			<p>In its letter on the ASC, Baker County expressed concerns about the response times and potential impacts to medical responders if they were committed to a project-related incident and would not be available to provide other services.</p> <p>Please provide a discussion of the ambulance services that serve the analysis area and how many ambulances are available to serve multiple incidents?</p>	<p>The B2H project is rural in nature and IPC would not rely on ambulance services to drive to a remote location emergency. As stated in Exhibit U (Section 3.4.7) each medical facility has access to Life Flight and/or Airlink. Life Flight has bases with helicopters in La Grande, Ontario, Pendleton, and Boise that could service the analysis area. Each medical provider in the analysis area as listed in Exhibit U, Section 3.4.7, have indicated that they have adequate capacity and the Project should not adversely impact these medical facilities. In addition, Saint Alphonsus Medical Center was contacted in March 2019 and has indicated that they could likely serve 3,500 more emergency room visits a year and would have capacity to still serve the community (see errata for Exhibit U). For non-emergency medical attention, personnel would be driven to the nearest medical facility for treatment.</p>

**Boardman to Hemingway Transmission Line Project –Application for Site Certificate (ASC)
 Oregon Department of Energy
 Request for Additional Information for the ASC (ASC RAI) Exhibit W – Retirement
 February 2019**

Request No.	ASC Section Ref.	ASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
ASC RAI W- 1	3.2	W-3		<p>Exhibit W describes decommission the facilities associated with the switching station “For the station, these facilities include an interconnecting bus system, switches, breakers, and instrumentation for the control and protection of the equipment.”</p> <p>However, this doesn’t match with the Cost Estimating Worksheet, which shows “N/A” for the switch yard on pages 25 and 26 of Exh W PDF) and \$0 for the switch yard on page 19 of the PDF.</p> <p>Please include costs associated with decommissioning the station.</p>	<p>If the transmission line was decommissioned, the switching station would remain in place and not be decommissioned because it would continue to be used by other transmission lines entering and existing the station. In other words, it would continue to have value beyond the B2H Project, and therefore, it would not be decommissioned, which is why the worksheet indicates “N/A” and the cost should not be included.</p>
ASC RAI W- 2	3.2	W-3		<p>Exhibit W states: “This restoration will include restoring the site to a condition suitable for uses comparable with the surrounding land uses, intended land use, and then-current technologies.”</p> <p>What is meant by current technologies?</p>	<p>“Then-current technologies” refers to how land use might change between now and in the future. For example, if the future land use of some agriculture land utilized new farming techniques, the restoration would match or accommodate the future land use and technologies, and not be limited how the land is used today.</p>

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ASC RAI W- 3		Attachment W-1 and Section 3.3		<p>PDF Page 20 of the Exh W PDF states “3rd Quarter 2016 Dollars” at the top of the page, but then the GDP index is for 2nd quarter 2016, and the text of Exh W (Section 3.3) states that it’s in 4th quarter 2016 dollars.</p> <p>What quarter of 2016 was used to generate the cost estimate?</p>	3rd quarter, August 15, 2016
ASC RAI W- 4		Attachment W-1 and Exhibit W		<p>The Cost Estimate states “Adjusted to Current Dollars” and “Total Site Restoration Cost (current dollars)”</p> <p>What quarter and year were last used to update for inflation?</p>	3rd quarter, August 15, 2016

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ASC RAI W- 5		Attachment 1		The Site Restoration Cost Estimating Guide recommends that the contingency for administrative and management expenses total 10 percent (10%) of the cost estimate; however, the applicant's cost estimate applies a value of only 4 percent (4%) yes does not explain the justification for proposing the lesser percentage. Please provide such justification.	A project the size of B2H, that covers such a large area is expected to realize an economy of scale that would justify a 4% contingency for Site Restoration. Also, the B2H project in operation will not result in any hazardous conditions that would be difficult or unusually expensive to restore (i.e. everything to be removed are inert materials) thus the lower restoration contingency is appropriate. The Project Owner Engineer (HDR) has extensive experience restoring transmission line projects that have demonstrated a 4% contingency is appropriate.

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L	OAR 635-008-0120	Protected Areas	The project proposes to cross upland habitat on Ladd Marsh Wildlife Area (LMWA), which is land owned and managed by ODFW. There is an existing transmission line and natural gas pipeline also located on Ladd Marsh Wildlife Area, in close proximity to the proposed ROW. The location of the proposed crossing functions as winter habitat for big game, and therefore ODFW expects that the best management practices and mitigation plans for Big Game Winter Range (as described in Exhibit P1) will apply to lands within the LMWA as well. When the time comes for planning roads, gated access, and timing of construction activity, ODFW recommends those plans be coordinated with the Wildlife Area Manager.	<p>It's unclear what specific "best management practices and mitigation plans" ODFW is referring to in this comment. The following management plans, and the best management practices specified therein, would apply to the portion of the project location on the Land Marsh Wildlife Area parcels: Reclamation and Revegetation Plan (Attachment P1-3); Vegetation Management Plan (Attachment P1-5); and Noxious Weed Plan (Attachment P1-5). Idaho Power will submit final versions of those plans to ODOE for its approval. ODFW is free to review and comment on those plans through their role as a reviewing agency.</p> <p>To the extent the parcels contain elk or mule deer winter range, ground disturbing activities would generally be restricted between December 1 to March 31 (see Fish and Wildlife Condition 10) and access control would be employed on project access roads with ODFW approval, as the landowner (see Fish and Wildlife Condition 27).</p> <p>Regarding timing of construction, besides the temporal limitations discussed above, Idaho Power will work with ODFW as the landowner to avoid or minimize impacts from construction work.</p>
L	ORS 97.740, ORS 358.905-358.962, ORS 390.235, and OAR 736-051-0080	Protected Areas	ODFW is aware of cultural resources in the vicinity of the proposed crossing of Ladd Marsh Wildlife Area. Under Oregon State Law (ORS 97.740, ORS 358.905-358.962, ORS 390.235, and OAR 736-051-0080) archaeological sites are protected on all non-federal public lands. To ensure compliance with applicable state cultural resource laws, ODFW requires Idaho Power contact the Oregon State Historic Preservation Office (SHPO) and provide documentation of concurrence from SHPO for the portion of the project that crosses Ladd Marsh Wildlife Area. If the overall project is determined by Idaho Power to have a federal nexus then documentation of compliance with relevant federal law, including Section 106 of the National Historic Preservation Act, may be provided instead.	Idaho Power has submitted cultural resource survey information for the Project to SHPO, including that portion of the Project which crosses LMWA (see Exhibit S).
P1	(standard ODFW comment)	Page 21; Condition 2 and 13	If construction activities encounter federally listed species covered by the Endangered Species Act, or those raptors and eagles covered the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act, ODFW recommends IPC contact the U.S. Fish and Wildlife Service given their federal jurisdiction.	Recommendation noted. As part of the NEPA permitting, IPC will be required to adhere to the ESA, MBTA, and bald and golden eagle act. Please refer to the NEPA POD, Appendix B1 for survey, monitoring, and reporting requirements for federal agencies. This does not need to be included in EFSC condition language as the comment addresses federal, and not state, jurisdiction.
P1	OAR 635-022-0060; OAR 635-415-0025	Page 26; Section 3.3.2 Category 2 habitat	In the time that has passed since the original design of biological surveys for the B2H project, ODFW has identified pygmy rabbits as State Sensitive Species and has recommended mitigation for pygmy rabbits on other energy facility projects proposed in the sagebrush habitats of eastern Oregon. Pygmy rabbits are dependent on mature sagebrush and deeper soils, and given the conservation concern regarding their populations, ODFW has determined active pygmy rabbit colonies meet the definition of Category 2 habitat.	<p>As requested, Idaho Power will add pygmy rabbit to the list of pre-construction surveys as follows:</p> <p><i>Fish and Wildlife Condition 2:</i> <i>Prior to construction, the certificate holder shall conduct, as applicable, the following biological surveys on all portions of the site boundary, regardless of whether those portions have been surveyed at the time of issuance of the site certificate:</i></p>

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			ODFW understands that pygmy rabbits were not detected in the initial B2H surveys, where access was granted. However, ODFW recommends that pygmy rabbits be a part of pre-construction surveys, and if active pygmy rabbit colonies are found within areas proposed for temporary or permanent disturbance, ODFW recommends they be contacted. At that time, ODFW would work with IPC to explore avoidance options including spanning colonies, locating tensioning/pulling/fly yards outside of colonies, and assure that unavoidable impacts are mitigated according to policy.	<p><i>a. Washington ground squirrels; and</i> <i>b. Raptor Nests-;</i> <i>c. <u>Pygmy rabbits; and</u></i> </p> <p>And as set forth in the forthcoming errata sheet for Exhibit P1, Idaho Power has addressed pygmy rabbit colonies as Category 2 habitat in Section 3.3.2 as follows:</p> <p>Category 2 habitat:</p> <ul style="list-style-type: none"> • ODFW elk (<i>Cervus canadensis nelsoni</i>) winter range (ODFW 2013a);^{4F1} • ODFW mule deer (<i>Odocoileus hemionus</i>) winter range (ODFW 2013a); • Bighorn sheep (<i>Ovis canadensis</i>) herd ranges (ODFW 2013b); • Areas of potential ground squirrel use, defined as areas adjacent to and within 4,921 feet (1.5 kilometers [km]) of WAGS Category 1 habitat, but not occupied by any squirrels either for burrowing or foraging, which is of similar habitat type and quality to the adjacent WAGS Category 1 habitat; • Fish-bearing streams; • Bat roosts and hibernacula other than caves; and • Pygmy rabbit (<i>Brachylagus idahoensis</i>) colonies. <p>In addition, Idaho Power has added pygmy rabbit to the language in Fish and Wildlife Condition 14:</p> <p>Fish and Wildlife Condition 14: During construction, if active pygmy rabbit colonies or the roost of a State Sensitive bat species is observed during the biological surveys set forth in Fish and Wildlife Conditions 1, 2, or 3, the certificate holder shall submit to the department for its approval a notification addressing the following:</p> <ol style="list-style-type: none"> Identification of the State Sensitive bat species observed; Location of the pygmy rabbit colony or bat roost; and Any actions the certificate holder will take to avoid, minimize, or mitigate impacts to the pygmy rabbit colony or bat roost.
P1, see also Exhibit BB Fish Passage	OAR 635-022-0060; OAR 635-415-0025; OAR 635-412	Page 73; Section 3.5.5.6	ODFW Fish Division and local District Fish Programs have reviewed this section, and based on the current application (subject to finalization prior to construction), ODFW finds fish impacts to be adequately considered and addressed. It is ODFW's understanding that fish passage plans and approvals have yet to be finalized prior to construction.	Comment noted. Fish passage plans and designs will need to be finalized based on final design and once access has been granted to survey all necessary waters.

¹ See Exhibit P3 for a complete discussion of elk habitat categorization.

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P1-3 Reclamation and Revegetation Plan	OAR 635-022- 0060; OAR 635- 415-0025	Page 20; Section 6.0 Reclamation success standards, monitoring, and maintenance	<p>Revegetation and reclamation serve an important function in minimizing impacts to wildlife habitat. Some habitats that will be impacted by this project, namely sagebrush shrubland and forests, take upwards of 10 to 50 years to recover their pre-disturbance form and function. IPC has offered a robust revegetation plan, however ODFW stands by its previous recommendation that reclamation/revegetation monitoring be performed for longer than 5 years post-construction. ODFW recommends IPC utilize an adaptive monitoring schedule and management plan that can address Project impacts as long as necessary to achieve success criteria.</p> <p>ODFW also finds IPC's proposed reclamation standards (Table 6) to be low relative to what ODFW has recommended and supported for other projects in similar habitats. Below are the recommendations ODFW made to ODOE for the B2H Notice of Intent, which we believe are still appropriate:</p> <p>[ODFW recommends the following criteria for reclamation success]:</p> <ol style="list-style-type: none"> 1. Maintain percent foliar cover of weed species within reclamation sites at a level equal to or less than the paired control site. This will reduce the risk of invasive weeds outcompeting favorable vegetation and creating a source population for dispersing weed species. 2. Reclamation actions should prioritize establishment of native perennial bunchgrasses. Native, perennial bunchgrasses are our best defense against fire-prone annual grasses that threaten the arid habitats crossed by this project. Maintain $\geq 70\%$ percent foliar cover of native perennial bunchgrasses of the paired control site. The remaining percentage of vegetation can be other desirable vegetation species not present at the control site or functional bare ground. 3. Reclamation actions in forested and shrub habitats should have appropriate woody species in the plant mix. Woody species should be plugged using appropriate aged plants to ensure the greatest possible revegetation success. Successful revegetation of sagebrush habitats should have at least 15 percent sagebrush foliar cover. 4. Maturity of vegetation within paired control sites should be used to determine the reclamation monitoring timeframe. Monitoring should be conducted on a regular 1-2 year interval until vegetation is established in a similar species composition as the paired control site. Monitoring efforts should then be extended to every 5-10 years (depending on habitat vegetation) until the vegetation reaches the same maturity as the paired control site when the Project impact occurred. 	<p>The Reclamation and Revegetation Plan provides for the possibility for additional monitoring beyond 5 years, including additional reclamation efforts and compensatory mitigation, stating:</p> <ul style="list-style-type: none"> • If after 5 years of monitoring some sites have not attained the success criteria or if at any point during the annual monitoring it is clear that reclamation cannot be successful (including private landowner denial of reclamation activities), IPC will coordinate with ODOE regarding appropriate steps forward. At this point, IPC may suggest additional reclamation techniques or strategies or monitoring, or IPC may propose mitigation to compensate for any permanent habitat loss. <p>Idaho Power thanks ODFW for its recommendations on success criteria. However, the success criteria currently set forth in the Reclamation and Revegetation Plan are sufficient to meet the EFSC Fish and Wildlife Siting Standard and for compliance purposes—e.g., Idaho Power's success criteria are similar to those in the Revegetation Plan approved by EFSC for the Wheatridge Wind Energy Facility site certificate). Therefore, neither ODOE nor EFSC should adopt ODFW's proposed criteria.</p>

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P1-3 Reclamation and Revegetation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 29; Section 6.5 Adaptive Management and Site Release	ODFW does not support the concept of waivers in the event of revegetation failure because that equates to permanent impact without offset, and the mitigation policy calls for no net loss. In the event of reclamation failure, despite remedial efforts, temporary impacts to wildlife habitat become permanent impacts. In these cases, the difference in compensatory mitigation offsets should be addressed (for example, if temporary impacts were mitigated at a 0.5:1 rate, the now permanent impacts would need to be mitigated at a 1:1 (or higher) rate). To account for such cases, ODFW recommends compensatory mitigation also be listed as a potential adaptive management option in the reclamation plan.	Use of the term "waiver" was brought to attention during RAI 4. It was Idaho Power's intent to remove this term from the Reclamation and Revegetation Plan and replace it with the language recommended by ODOE in RAI 4. The term was removed in all but one location of the Reclamation and Revegetation Plan. It is in error that this term is still in the Reclamation and Revegetation Plan. See Exhibit P errata sheet for the changes to text in Section 6.5 of the Reclamation and Revegetation Plan to eliminate the "waiver" issue.
P1-5 Noxious Weed Plan	OAR 635-022-0060; OAR 635-415-0025	Page 26; Section 6.1 Monitoring	<p>Linear projects such as transmission lines and pipelines, often inadvertently spread noxious weeds across the landscape. This is perhaps the greatest risk of this project to Oregon's wildlife habitats. For this reason, ODFW believes noxious weed monitoring and control is an extremely important minimization measure (per OAR 635-415). IPC is proposing noxious weed monitoring only for the first 5 years of the project, post-construction. If control efforts are not successful, IPC will consult with ODOE on next steps and may request a 'waiver'. ODFW contends that noxious weed monitoring and control ought to be the obligation of the applicant for the life of the project impact, for if this project led to noxious weed expansion, that could be interpreted as an expansion of project footprint. If the project's footprint were to expand over time, the areal extent of the project impact would need to be recalculated and could impact the compensatory mitigation quantities.</p> <p>Long-term monitoring and successful treatment of weeds are important to the success of habitat restoration efforts and for habitat health. ODFW recommends that IPC monitor and control invasive weeds beyond the initial 5-year treatment period on a regular schedule of every 7 –10 years for the life of the Project. Treatment should occur when IPC has identified established weeds at a rate higher than pre-Project conditions. The Department recommends IPC work collaboratively with ODOE and the Department to define an appropriate monitoring schedule.</p>	<p>Use of the term "waiver" was brought to attention during RAI 4. IPC made changes to the Reclamation and Revegetation Plan as recommended by ODOE. It is in error that those changes were not also made to the Noxious Weed Plan. See Exhibit P errata for the changes to text in Sections 5.3.4 and 6.1 of the Noxious Weed Plan.</p> <p>Further, Section 5.3.4 of the Noxious Weed Plan provides for the possibility for weed control beyond 5 years (appropriate plan for long-term weed control) in areas of the Project where weed control has been <u>successful</u>, stating:</p> <ul style="list-style-type: none"> Noxious weed control efforts will occur on an annual basis for the first 5 years post-construction. When it is determined that an area of the Project has successfully controlled noxious weeds at any point during the first 5 years of control and monitoring, IPC will request concurrence from ODOE. If ODOE concurs, IPC will consult with ODOE to design an appropriate plan for long-term weed control. <p>Because the Noxious Weed Plan provides for adaptive management that may include monitoring after the 5-year period, no further changes are necessary to identify specific monitoring periods at this time, as requested by ODFW.</p>
P1-6 Fish and Wildlife Habitat Mitigation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 15; Section 3.3.2; Table 9. Accounting for Mitigation Debit for Permanent Direct Impacts, Category 2	IPC proposes to mitigate for permanent direct impacts in Category 2 habitat at the rate of >1 acre offset per 1 acre of impact (>1:1). The ODFW Fish and Wildlife Habitat Mitigation Policy sets forth a goal for Category 2 habitats of no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity or quality. While the proposed rate of >1:1 technically meets the 'no net loss' of quantity, if the rate tends closer to 1 (for example 1.1:1, as opposed to 2:1) it does not leave much of a 'buffer' to achieve no net loss of quality, and even more difficult to achieve net gain in quality. A larger ratio creates a buffer to safeguard against failure of the habitat restoration/enhancement activities that IPC would be performing as part of their 'net benefit' activity. The narrower the ratio, the more in-depth	Idaho Power thanks ODFW for its recommendations on Category 2 mitigation. However, as ODFW acknowledges, the >1:1 mitigation offset meets the no-net-loss standard, and therefore, no further changes to the HMP are necessary.

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			monitoring ODFW would recommend to ensure that the goals of no net loss in quantity and quality were achieved. This is the reason most project applicants opt for a larger mitigation ratio (such as 2:1) in category 2 habitats, so they can have some portion of the mitigation area that is struggling to provide uplift while still meeting the net benefit goal.	
P1-6 Fish and Wildlife Habitat Mitigation Plan	OAR 635-022-0060; OAR 635-415-0025	Page 15; Section 3.3.2; Table 10. Accounting for Mitigation Debit for Temporary Direct Impacts, Category 3 and 4	Similar to the comment provided above, the ratio of <1:1 could meet the policy but if the rate of mitigation is 0.1:1 it will be unlikely that IPC can meet the goals of the policy with regard to temporal loss. If the rate of mitigation is closer to 0.5:1 or 0.9:1 it becomes more obvious that temporal habitat loss will be adequately addressed.	Again, Idaho Power thanks ODFW for its recommendations, but as ODFW acknowledges, the <1:1 mitigation offset meets the mitigation standard, and therefore, no further changes to the HMP are necessary.
P2	OAR 635-140-0000 - 0025	P2-12 / Section 3.6 Baseline Surveys	Due to changes in sage-grouse abundance and habitat use over time, sage-grouse lek survey data has a 10-year shelf-life. Before construction and calculation of mitigation responsibility, the project proponent should resurvey areas for sage- grouse leks where previous surveys were conducted 10 or more years prior to construction. This resurvey effort should be minimal because ODFW and BLM have significantly increased survey efforts for sage-grouse leks and the project proponent will only be requested to survey areas that have been surveyed within 10 years prior to project construction. The project proponent must coordinate with ODFW to determine where resurveys should be conducted.	Idaho Power understands the dynamic nature of sage-grouse habitat use and the related concept that surveys may have a temporal shelf life. That said, Idaho Power's compensatory mitigation requirements will be dictated by the State's Sage-Grouse Habitat Quantification Tool, which has not been finalized so it's unclear what survey information, if any, will be required to run the Tool for the Project. Accordingly, while Idaho Power acknowledges that certain sage-grouse surveys may need to be updated prior to construction, Idaho Power suggests that any new condition language regarding surveys should defer to the forthcoming HQT protocols in general terms and not specify any specific survey protocol as suggested by ODFW here. That way, the condition language will be flexible enough to incorporate the as-yet-defined HQT protocols, which may differ from ODFW's current proposal. Idaho Power includes the following change to the pre-construction survey condition language in its Exhibit P errata: <p><i>Fish and Wildlife Condition 2:</i> <i>Prior to construction, the certificate holder shall conduct, as applicable, the following biological surveys on all portions of the site boundary, regardless of whether those portions have been surveyed at the time of issuance of the site certificate:</i></p> <p><i>a. Washington ground squirrels; and</i></p> <p><i>b. Raptor Nests;</i></p> <p><i>c. Pigmy rabbits; and</i></p> <p><i>d. Greater sage-grouse, as necessary for the State of Oregon to calculate the amount of sage-grouse habitat compensatory mitigation required for the facility using Oregon's Sage-Grouse Habitat Quantification Tool.</i></p>

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P2	OAR 635-140-0000 - 0025	P2-17 / Fish and Wildlife Condition 25:	<p>Condition 25 indicates that mitigation for project impacts to sage-grouse and their habitats will not be calculated or provided until the 3rd year of operation in order to incorporate final analysis of indirect impacts from project roads. Postponing mitigation from initial project construction impacts through year 3 of project operation will result in a detrimental temporal loss of sage-grouse habitat. This several-year loss of sage-grouse habitat does not meet OAR 635-140-0010 and 635-140-0025. To comply with these policies, ODFW proposes that the project proponent reduce prolonged loss of sage-grouse habitat by calculating and providing mitigation for sage-grouse in a 2 stage process. First, the project proponent should fully mitigate, as outlined in OAR 635-140-0025(3), for areas of known, direct (towers, roads, pulling & tensioning area, etc.) and indirect project impacts (excluding roads) prior to construction. Second, upon completion of the traffic study in year 3 of operation, the project proponent should provide mitigation for any remaining indirect impacts to sage-grouse habitat identified from the project road analysis. Mitigation for indirect road impacts should be established immediately after finalizing the road analysis. Mitigation will be calculated using the ODFW Habitat Quantification Tool (HQT), and can be completed through permittee-responsible offsite mitigation or payment into ODFW's In-Lieu Fee program.</p>	<p>Idaho Power's approach to sage-grouse mitigation already appears to be aligned with ODFW's comment. Fish and Wildlife Conditions 8 and 21 provide that Idaho Power will implement sage-grouse conservation actions during construction. Then, under Fish and Wildlife Condition 25, Idaho Power will provide traffic data to the State so it can calculate access road mitigation using the Sage-Grouse Habitat Quantification Tool. After receiving the State's calculations, Idaho Power will provide a report to ODOE demonstrating that Idaho Power's conservation actions have already fully covered the State's final mitigation calculations, and if not, Idaho Power will include additional compensatory mitigation in the report. In either scenario, consistent with ODFW's proposal, Idaho Power will commence mitigation for impacts (direct and indirect) from all facility components other than the access roads during construction. The plan also may, at Idaho Power's discretion, include additional mitigation that may ultimately be shown to cover the access roads impacts; but at a minimum, it will cover impacts from all non-access-road facility components as proposed by ODFW. And after the State provides the final impact calculations after receiving the traffic study results, Idaho Power will demonstrate that all impacts (from roads or otherwise) will be mitigated either because the existing conservation actions were overly-conservative and already sufficient to cover the road impacts, or because Idaho Power proposes additional conservation actions to address any uncovered road impacts.</p> <p><i>Idaho Power includes the following changes to the conditions in its Exhibit P errata to make this clear:</i></p> <p>Fish and Wildlife Condition 8: <i>Prior to construction, the certificate holder shall finalize, and submit to the department for its approval, a final Sage-Grouse Habitat Mitigation Plan.</i></p> <p>...</p> <p><i>b. The final Sage-Grouse Habitat Mitigation Plan shall address the potential sage-grouse habitat impacts through mitigation banking, an in-lieu fee program, development of mitigation projects by the certificate holder, or a combination of the same.</i></p> <p>...</p> <p><i>iii. The final Sage-Grouse Habitat Mitigation Plan shall include compensatory mitigation sufficient to address impacts from, at a minimum, all facility components except indirect impacts from access roads. As referenced in Fish and Wildlife Condition 25, the certificate holder shall demonstrate during or about the third year of operation that sage-grouse habitat mitigation shall be commensurate with the final compensatory mitigation calculations, which will be based on the as-constructed facility and will include indirect impacts from access roads, either by showing the already-implemented mitigation is sufficient to cover all facility component impacts, or by proposing additional mitigation to address any uncovered impacts.</i></p> <p>....</p>

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P2	OAR 635-140-0000 - 0025	P2-22 / Table P2-6	ODFW recommends Table P2-6 identify the need for compensatory mitigation for permanent indirect impacts from project access roads. Roads can have long lasting indirect impacts on sage-grouse habitat as vehicle traffic results in auditory impacts and human presence can interfere with sage-grouse use of habitat adjacent to roads. ODFW will request compensatory mitigation for new project roads or existing roads with increased traffic rates if access control cannot be implemented. ODFW will use the HQT to calculate a mitigation responsibility and assimilate any minimization measure proposed by the project proponent. Use this information to update relevant sections such as on page P2-23.	The requested information is already provided. Table P2-6 provides for compensatory mitigation for permanent indirect impacts to roads. Under the Mitigation Measures column, Table P2-6 reads, "Permanent indirect impacts from the access roads will be mitigated by . . . implementing the Sage-Grouse Habitat Mitigation Plan." Fish and Wildlife Conditions 8, 21, and 25 set forth the framework for implementation of the Sage-Grouse Habitat Mitigation Plan. These include Idaho Power providing the State of Oregon the information necessary to calculate compensatory mitigation. The information necessary includes final design prior to construction and the as-built design post-construction including the results of traffic studies. It is Idaho Power's understanding and intent that the HQT will calculate compensatory mitigation requirements for Project roads that are part of the final design and as-built facility.
P2	OAR 635-140-0000 - 0025	P2-24 / Table P2-7	Table P2-7 describes temporary indirect impacts to sage-grouse habitat from access roads and invasive plant species. ODFW requests that the project proponent also address temporary indirect impacts that will be generated from the construction of the transmission line, associated ancillary features, and use of any multi-use or fly yards within sage-grouse habitat.	Idaho Power addresses the effects from the transmission line, associated ancillary features, and multi-use or fly yards in the discussions on permanent and temporary direct impacts from vegetation clearing in Section 3.7.3 of Exhibit P2.
P2	OAR 635-140-0000 - 0025	P2-27 / Third paragraph	ODFW requests the project proponent coordinate design and execution of the project road traffic analysis to ensure state considerations are met.	Per Fish and Wildlife Condition 3, Idaho Power will submit the traffic study to ODOE for its approval, and ODFW is free to review the plan as a reviewing agency. Before that time, Idaho Power anticipates working with ODFW in the development of the plan before submittal to ODOE to benefit from ODFW's knowledge on the subject, but Idaho Power sees no need to specify that in a condition as such coordination is not necessarily required.
P3	OAR 635-022-0060; OAR 635-415-0025	Fish and Wildlife Condition 27	ODFW recommends that IPC provide confirmation of access control on relevant facility access roads, and that the access control be included in monitoring/reporting so as to ensure that disturbance to elk populations are minimized.	Idaho Power is committed to pursuing access control on all facility access roads in sensitive elk and sage-grouse habitat, subject to landowner approval (see Fish and Wildlife Condition 27). However, it is the responsibility of the landowner/local law enforcement to enforce such access control.
P3	OAR 635-022-0060; OAR 635-415-0025	Monitoring	ODFW recommends IPC develop a plan for deploying counters in collaboration with ODFW to ensure the goals of the monitoring are met. It would be helpful for this plan to identify which category roads will be monitored, where, how many, etc.	As discussed above, Idaho Power anticipates working with ODFW to develop the traffic study and will address these types of specific suggestions at that time.
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Section 3.2 Methods, Washington ground squirrel	It is ODFW's understanding that the majority of the proposed project has not yet been surveyed for Washington grounds squirrels (WAGS) due to limitations of access. Given the last date of survey (2014), ODFW notes that all WAGS areas will need to be re-surveyed because we are beyond the standard three-year shelf life for those survey data. Upon further review of the survey methods for WAGS, ODFW realized that previous survey was not in line with our recommended standard survey methodology. ODFW apologizes for not recognizing this sooner. IPC's analysis area consists of the Right- of-Way plus a ½ mile buffer to provide flexibility in potential ground disturbance for roads, laydown sites, or other ground-disturbance purposes.	Idaho Power understands the shelf-life of WAGS surveys, and in Fish and Wildlife Condition 2, Idaho Power is proposing to survey all areas of the site boundary for WAGS whether those areas have been previously surveyed or not, consistent with ODFW's comment here. Idaho Power will conduct the pre-construction WAGS surveys referenced in Fish and Wildlife Condition 2 using the 1,000-foot buffer as recommended by ODFW. Idaho Power has included this information in the Exhibit P1 Errata for Fish and Wildlife Condition 2, as shown above.

Boardman to Hemingway Transmission Line Comments on the Application for Site Certificate (ASC) From Oregon Department of Fish and Wildlife				
Exhibit	Rule/ Ordinance/Law Reference	Pg. / Para. / Sentence Reference (as needed)	Compliance Comment or Condition Language	IPC Response
			The WAGS survey extended out an additional 785 feet beyond the ½ mile buffer. ODFW did not correct this distance in its previous reviews, however, the standard methodology recommends survey out an additional 1000 feet beyond areas of potential ground disturbance. ODFW recommends that future WAGS surveys include this additional 215 feet.	
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Page Q-21; Impacts to Washington Ground Squirrel habitat	In the first paragraph on page Q-21, IPC discusses potential impacts to habitats occupied by WAGS. Mid-paragraph IPC states “temporary impacts to category 2 WAGS habitat in agricultural areas will likely be short-term...”. It is not clear if IPC then included active agricultural areas in its calculation of impacts, however, ODFW does not consider active agricultural areas to be WAGS habitat because the ground disturbance precludes occupancy.	<p>The Exhibit Q errata addresses this comment as follows:</p> <p>Washington Ground Squirrel Surveys</p> <p>The objective of these surveys was to identify the presence of WAGS colonies in the vicinity of the Project so that impacts to WAGS may be avoided and/or minimized. The protocols used during the WAGS surveys were based on the survey methods described in Morgan and Nugent (1999). The details and justifications for these methods are provided in the Revised Final Biological Survey Work Plan (Exhibit P1, Attachment P1-2).</p> <p>The survey area extends from Bombing Range Road in Morrow County east to East Birch Creek Road south of Pilot Rock, Oregon, in Umatilla County (milepost [MP] 0 to 64 of the Proposed Route). ODFW considers a 785-foot buffer in continuous suitable habitat around WAGS colonies as Category 1 habitat. As a result, the survey area consisted of the <u>analysis-area-Site Boundary</u> plus a 785-foot buffer in suitable habitat. Suitable habitat for WAGS includes native grasslands and shrub-steppe; however, the species is also known to use lesser quality habitat such as non-native annual grasslands. IPC has identified a total of 18,263 acres of survey area.</p>
Q	OAR 345-022-0070; ORS 496.171-192; OAR 635-100-0105; OAR 635-415	Page Q-75; Washington Ground Squirrel Monitoring	To be consistent with ODFW recommendations on other EFSC projects with potential impacts to WAGS, ODFW recommends long-term monitoring of active colonies. The purpose of this long-term monitoring is to assess adequacy of the 785- foot buffer and to monitor for any potential drift in colony extent that may require some additional avoidance measures in the O&M phase of the project to avoid potential take of WAGS. ODFW recommends surveys of existing, active colonies plus an additional 500 feet. Frequency would be years 1, 3, 5, and then at 5-year intervals for the life of the project with reporting to ODFW and ODOE.	Typical O&M would be limited to trucks driving the ROW once or twice a year. Because of the de minimis nature of the potential impact involved with these visits, no WAGS monitoring should be required post-construction.

Oregon Department of Energy
Request for Additional Information for the ApASC (ApASC RAI) Exhibit XXX – EXHIBIT DSL Comments
November 2, 2018

Request No.	ApASC Section Ref.	ApASC Page Ref.	Applicable Rule (OAR 345-021- or other as indicated)	Request for Additional Information	Response
Exhibit J Parts 1, 2, 3; JPA Form Block 6			OAR 141-085-0550 (5)	Though the JPA form has the totals of permanent and temporary split between removal and fill, Exhibit J Impact tables : J-2-6, J-2-7, J-2-8A, J-2-8B, J-2-9A, J-2-9B, J-2-10 list the impacts in both temporary and permanent for each wetland and waters but do not indicate whether the impact proposed will be removal, fill or both. Please provide a table of all impacts showing removal and fill both permanent and temporary. The JPA Block 6 refers to Appendix O and K for the lists. It is not clear what /where those appendices are.	The 2018 JPA submittal included a separate appendices document to the JPA form. The JPA Appendices have detailed narrative, tables, and figures pertaining to the different sections of the JPA form. JPA Appendices Table O-1A and Table O-2A were revised to include columns for temporary removal-fill volumes. Values for temporary removal and fill were added to the JPA form Block 6. The revised Tables O-1A and O-2A, and the revised JPA Form Block 6 have been submitted to ODOE, along with Appendix K figures K-239, K-240, and K-241.

B2HAPPDoc20 ASC ODOE Guidance Doc for HPRCSITs in the EFSC Process

TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Tuesday, February 12, 2019 3:36 PM
To: 'Stokes, Mark'; Stanish, David
Cc: English, Aaron
Subject: ODOE Guidance Doc for HPRCSITs in the EFSC Process
Attachments: HPRCSITs EFSC Pathway Guidance Doc 2019-02-11.pdf

Good afternoon,

The question of how Historic Properties of Religious and Cultural Significance to Indian Tribes (“HPRCSITs”) are treated in the EFSC process has been raised for several facilities. ODOE has generated a guidance document to provide to Tribes and to applicants/certificate holder to help outline the various options for EFSC to review and make findings, based on the evidence on the record, with respect to HPRCSITs. There is a lot of information in this document and I’d recommend having a call to go over the nuances and details associated with each pathway. Please also note that these are not strict pathways and that it is most likely that a combination of the pathways apply to some facilities in the EFSC review process. Let me know when you can chat or what questions there are. Thanks,

Kellen

Kellen Tardaewether
Senior Siting Analyst
Energy Facility Siting Division
Oregon Department of Energy
550 Capitol St N.E., 1st Floor
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Leading Oregon to a safe, clean, and sustainable energy future.

TARDAEWETHER Kellen * ODOE

From: TARDAEWETHER Kellen * ODOE
Sent: Tuesday, February 12, 2019 3:38 PM
To: Teara Farrow Ferman
Cc: 'Catherine Dickson'; Carey Miller
Subject: ODOE Guidance Doc for HPRCSITs in the EFSC Process
Attachments: HPRCSITs EFSC Pathway Guidance Doc 2019-02-11.pdf

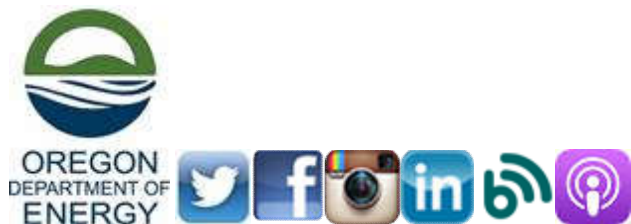
Good afternoon,

The question of how Historic Properties of Religious and Cultural Significance to Indian Tribes (“HPRCSITs”) are treated in the EFSC process has been raised for several facilities. ODOE has generated a guidance document to provide to Tribes and to applicants/certificate holder to help outline the various options for EFSC to review and make findings, based on the evidence on the record, with respect to HPRCSITs. There is a lot of information in this document and I’d recommend having a call to go over the nuances and details associated with each pathway. Please also note that these are not strict pathways and that it is most likely that a combination of the pathways apply to some facilities in the EFSC review process. Let me know when you can chat or what questions there are. Thanks,

Kellen

Kellen Tardaewether

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HPRCSITs* in the EFSC Process

PATHWAY 1

- HPRCSITs** identified in EFSC process (application, SHPO, Tribal comments)
- Applicant and Tribe negotiate independently to come to an agreement about impacts to and mitigation for HPRCSITs
- ODOE/EFSC receive confirmation from Tribe that facility (w/ mitigation) not likely to result in significant adverse impacts

Less info on the record

- No additional information on HPRCSITs provided
- ODOE recommends EFSC finding under OAR 345-022-0090(1) relying on Tribal and applicant letters ***
- EFSC may adopt specific mitigation conditions only if proposed as applicant representations, if provided

PATHWAY 2

- HPRCSITs** identified in EFSC process (application, SHPO, Tribal comments)
- Applicant and Tribe negotiate independently and agree to what info provided regarding:
 - * Description of HPRCSITs
 - * Impact Assessment
 - * Mitigation
- ODOE/EFSC receive confirmation from Tribe that facility (w/ mitigation) not likely to result in significant adverse impacts

Coordination for info on the record

- Agreed upon information on HPRCSITs, impact assessment and mitigation measures provided
- ODOE recommends EFSC finding under OAR 345-022-0090(1) relying on Tribal and applicant letters and/or info provided
- EFSC may adopt specific mitigation conditions if proposed as applicant representations, if provided

PATHWAY 3

- HPRCSITs** identified in EFSC process (application, SHPO, Tribal comments)
- based on available data, applicant provides:
 - * Description of HPRCSITs
 - * Impact Assessment
 - * Mitigation
- Tribes and SHPO provide comments, applicant may revise application

More info on the record

- Available information on HPRCSITs, impact assessment and mitigation measures provided
- ODOE recommends EFSC makes finding
- EFSC may incorporate comments from SHPO and Tribes, including mitigation conditions
- EFSC imposes mitigation conditions, if necessary

* Information on Historic Properties of Religious and Cultural Significance to Indian Tribes ("HPRCSITs") will be kept confidential consistent with state statute and ODOE policy. Confidential information on HPRCSITs may be provided to Council in a closed, executive session at a Council meeting or information on HPRCSITs may be provided in Orders in a manner satisfactory to Tribes to maintain confidentiality.

** If HPRCSITs have not been determined eligible by SHPO, and there is not information available for the applicant to evaluate impacts, if the Tribe represents they are likely or recommended eligible, the Tribe must provide evidence to substantiate its representation for evaluation by Council under Pathway 2 and Pathway 3.

*** EFSC may disagree with ODOE recommendation and require more evidence to make finding. OAR 345-022-0090(2) states: "The Council may issue a site certificate for a facility that would produce power from wind, solar or geothermal energy without making the findings described in section (1). However, the Council may apply the requirements of section (1) to impose conditions on a site certificate issued for such a facility."

**Attachment 5: Documents and Agency Consultation in Referenced Proposed
Order (added after DPO)**

Memo



Daly • Standlee & Associates, Inc.
4900 S.W. Griffith Drive
Suite 205
Beaverton, Oregon 97005
(503) 646-4420
Fax (503) 646-3385

Date: March 6, 2016

To: Max Woods
Oregon Department of Energy

From: Kerrie G. Standlee, P.E.

Re: B2H Application For Site Certificate - Identification of Ambient Noise
Monitoring Sites Representative of New Noise Sensitive Receptors

DSA File #: 108161

CC: Kristine Robson, Cardno
Emily Merickel, Cardno

Max:

In our February 22, 2016 meeting at McDowell, Rackner & Gibson, P.C., we discussed the idea that Idaho Power might be able to use ambient noise data measured in 2012 to represent the ambient noise levels that would be found at residential receivers located along newly identified segments of the B2H power line. I commented during the meeting that I could agree with the approach proposed by Mr. Bastasch of CH2M if he could provide information that would explain how the data measured at a specific monitoring site would be representative of that expected at a particular residence. It was my understanding that Mr. Bastasch would work to provide that information.

After I received the March 15, 2016 CH2M Technical Memorandum entitled, *Updated Monitoring Point Applicability for Boardman to Hemingway (B2H)*, I reviewed it to see if the information provided was sufficient enough for me to conclude that the ambient noise at residences along the revised B2H line path could be found in the data already collected in 2012. While I still think it might be possible to find representative data within the 2012 data, I cannot agree at this time that the ambient noise levels at residences along the new segments of B2H are found at the monitoring locations proposed in the memorandum. To reach that conclusion I need to see more information concerning how the 2012 monitoring locations proposed in the March 15 memorandum would have noise levels like those that would be found at the new residences. Simply saying that the original monitoring locations are within the proximity of the new locations is not enough explanation for me.



**B2H Application For Site Certificate - Identification of Ambient
Noise Monitoring Sites Representative of New Noise Sensitive
Receptors**

At this time, it would be helpful if more detailed aerial photographs were provided like those presented in the original B2H application materials showing the residences located along the new segments of the power line route. In addition, it would be helpful to know if a field trip has been made to determine if the conditions affecting the acoustic environment at the new residential locations are actually similar to those affecting the environment at the proposed representative monitoring locations. It would be good to know if there is any plan to do a reconnaissance trip if one has not been conducted. Finally, it would be helpful if more information could be provided concerning why the proposed monitoring locations would provide data that would be representative of the environment found at the new residences.

TARDAEWETHER Kellen * ODOE

From: Stu Spence <SSpence@cityoflagrande.org>
Sent: Tuesday, April 14, 2020 3:13 PM
To: TARDAEWETHER Kellen * ODOE
Cc: Robert Strope
Subject: Morgan Lake Question
Attachments: Morgan Lake Sign.pdf

Hello Kellen,

City Manager Robert Strope asked me to clarify this question for you. This attachment is a mock up of the sign that's at the lake and does illustrate the existing campsites along the Northwest section of the lake. They are essentially all clustered around the same area. We don't have a map other than this. The rest of the park is designated as Day Use only. Please let me know if you need further clarification or for me to label on a Google Earth illustration.

Stu Spence

Parks & Recreation Director
Direct Line: 541-962-1348
Cell: 541-656-7340



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From: Robert Strope <RStrope@cityoflagrande.org>
Sent: Tuesday, April 14, 2020 10:24 AM
To: Stu Spence <SSpence@cityoflagrande.org>
Subject: FW: Morgan Lake Question

Stu,

Please see below and prepare a response.

Robert

Robert A. Strope, MPA

City Manager
City of La Grande
rstroke@cityoflagrande.org
(541) 962-1309
(541) 963-3333 fax

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From: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Sent: Monday, April 13, 2020 2:26 PM
To: Robert Strobe <RStrobe@cityoflagrande.org>; Robert Strobe <RStrobe@cityoflagrande.org>
Subject: Morgan Lake Question

Hi Robert!

Long time no talk! (We are in another “dormant” period as we are working on the proposed order addressing the comments on the DPO, quite the effort so far but we are making progress).

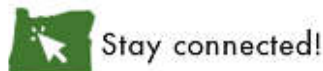
How’s the City holding together? Are you and staff working remotely during the COVID19 emergency? The vast majority of ODOE staff are working from home, it’s taken a bit to get used to but we are chugging along as usual.

I’m working on addressing comments regarding Morgan Lake and am going through the comments and IPC responses about noise at Morgan Lake. Based on the DPO comments from the public, IPC provided an updated noise analysis that includes the campsites at Morgan Lake. However, as I recall from visiting and my understanding of Morgan Lake, it appears that IPC may have modeled the day use areas as campsites as well as the campsites. IPC sent me the attached doc for informational purposes, but because the record is closed to those except reviewing agencies, could you verify where the campsites/day use areas are at Morgan Lake? Or do you have and can send this map if it’s from the City? Let me know if this makes sense or if you’d like to discuss, I’m available via email and my mobile. I really hope you and everyone else over there is doing well! Crazy times!

Kellen



Kellen Tardaewether
Senior Siting Analyst
550 Capitol St. NE Salem, OR 97301
P: 503-373-0214
C: 503-586-6551
P (In Oregon): 800-221-8035



From: Stanish, David <DStanish@idahopower.com>
Sent: Monday, April 13, 2020 1:42 PM
To: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Cc: Stokes, Mark <MStokes@idahopower.com>; English, Aaron <Aaron.English@tetrattech.com>
Subject: RE: Morgan Lake NSR Question

That's correct. They're not all campsites based on the information we have. Some are day-use-only areas. The attached City of La Grande sign shows the 11 actual campsites along the northwest portion of the lake.

David Stanish | Senior Counsel | Idaho Power Company
1221 W. Idaho Street, Boise, Idaho 83702 | 📞:(208) 388-2631
📠:(208) 433-2807 | ✉️: DStanish@idahopower.com

From: TARDAEWETHER Kellen * ODOE <Kellen.Tardaewether@oregon.gov>
Sent: Monday, April 13, 2020 9:37 AM
To: Stanish, David <DStanish@idahopower.com>
Cc: Stokes, Mark <MStokes@idahopower.com>; English, Aaron <Aaron.English@tetrattech.com>
Subject: [EXTERNAL]Morgan Lake NSR Question

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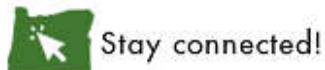
David,

Could you verify the NSR's that are the campsites modeled for the revised noise analysis? It appears that some of these locations modeled aren't campsites but I wanted to confirm.





Kellen Tardaewether
Senior Siting Analyst
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STOP! CAMPERS MUST REGISTER

CAMPER REGISTRATION INSTRUCTIONS

THERE IS NO FEE - CHECK OUT TIME IS NOON

QUIET HOURS 10PM - 7AM

- Please camp only in designated numbered sites. Set up your campsite, then return to complete form.
- Drop copy of registration form in box.
- Attach campsite copy to site marker post.
- Enjoy!

Camping Area
With numbered campsites

Day ONLY Use Area



CAMPGROUND RULES

- Park open first day of ODFW fishing season thru October 31st.
- All vehicles must stay on approved roads and parking areas.
- Camping is only allowed in the camping area around the northwest side of the lake where numbered sign posts designate camp sites.
- Overnight camping is limited to three (3) days.
- Fires allowed only in metal fire rings until fire ban is in effect.
- Pick up after yourself.
- No fireworks or firearms.
- No smoking / vaping.

ANNOUNCEMENTS

ESTERSON Sarah * ODOE

From: ESTERSON Sarah * ODOE
Sent: Wednesday, October 30, 2019 2:59 PM
To: BRINKMANN Bob * DGMI
Subject: Information on Blasting

Hi Bob,

It was great to talk to you; please forward any information you think would be helpful in understanding requirements for blasting/blasting permits.

Thanks,
Sarah



Sarah T. Esterson
Senior Siting Analyst
550 Capitol St. NE | Salem, OR 97301
P: 503-373-7945
C: 503-385-6128
P (In Oregon): 800-221-8035



Stay connected!

ESTERSON Sarah * ODOE

From: BRINKMANN Bob * DGMI
Sent: Wednesday, October 30, 2019 3:11 PM
To: ESTERSON Sarah * ODOE
Subject: Blasting Guidelines
Attachments: Blasting Guidelines.pdf

Hi Sarah, Per our conversation regarding the above please see the attached for info on blasting.

Regards,
Bob Brinkmann, R.G.
Hydrogeologist; Hydrocarbon/
Geothermal Resources Geologist
Oregon Department of Geology and Mineral Industries
Mineral Land Regulation & Reclamation
541 967-2068

Unless otherwise indicated, all information in this correspondence is classified as Level 1, "Published" according to State of Oregon statute and administrative policy

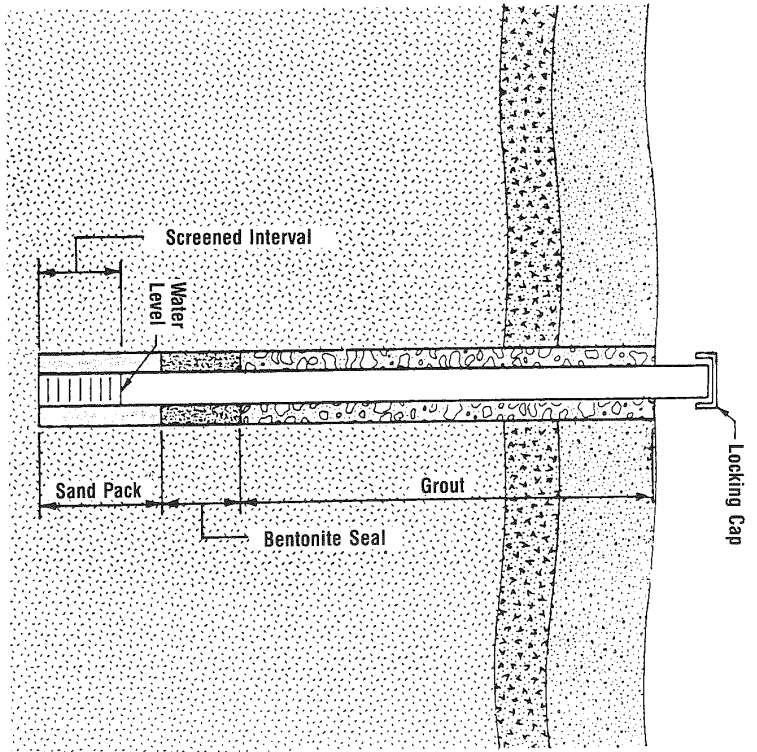


Figure 5.9 Typical cross-section of groundwater monitor well.

- Recycle process water through closed-loop setting pond systems;
- Routinely inspect water dust suppression systems to ensure that piping does not leak and that spray nozzles are operating efficiently;
- Operate customer truck washdown systems on a closed-loop basis utilizing a recirculation pond;
- Keep adequate vegetation on all areas possible to minimize erosion and reduce runoff water velocities to allow water to filter back into the ground.

Blasting Concerns

Every hard rock quarrying operation extracts stone from its geologic formation by the controlled use of explosives and/or blasting agents. No aspect of quarrying causes more apprehension or is less understood than blasting. Lay perceptions of blasting are often based on movie or television scenes showing dust and debris flying in all

directions accompanied by thunderous noise. These spectacular productions reinforce the idea that the use of explosives is an ultra-hazardous activity. They do not represent what actually happens in a modern, well-controlled blasting operation.

Blasting Statistics: Obviously the use of explosives requires great care. However, the ultra-hazardous perception needs to be viewed in a statistical light. In the United States during 1987, 4.5 billion pounds of explosive materials were used in blasting activities, largely in coal mining. Charge weight per blast varied from less than one pound to several hundred thousand pounds, with an estimated average of 7,000 lb per blast.⁵ This means that about 640,000 blasts were detonated during the year, an average of more than 2,400 blasts each and every work day. Quarry blasting in 1987 accounted for slightly more than 10% of the total quantity of explosive materials used, amounting to approximately 483 million pounds. During 1987 as well as 1988, not one fatality was attributed to quarry blasting,⁶ which is a commendable safety record. *Termining quarry blasting as an ultra-hazardous activity is therefore quite unfounded and certainly misleading.*

Regulation: The manufacture and use of blasting materials is strictly controlled by a number of federal agencies: the Bureau of Alcohol, Tobacco and Firearms (BATF) of the Treasury Department; the Department of Transportation (DOT); the Occupational Safety and Health Administration (OSHA); and the Mine Safety and Health Administration (MSHA). In addition, many states and local jurisdictions regulate the effects of blasting in terms of ground and air vibration levels.

Blasting damage occurs in three ways: (1) direct impact by flying rock usually referred to as *flyrock*; (2) cracks and failures in buildings from excessive ground motion; and (3) conditions produced by excessive air concussion, which is referred to as *overpressure* or *airblast*.

Flyrock: For safety and economic reasons, quarry blasts are usually designed to restrict the area over which loose rock fragments are distributed, thus minimizing the likelihood of flyrock. Personnel safety is paramount to the operator, who also has a vested interest in preventing damage to equipment. Further, the larger the area over which the rock is distributed by a blast, the more expensive is the cleanup and loading of this material for transport to the primary crushers.

Ground Motion: The purposes of blasting are to displace rock from the quarry face and to produce fragmentation that permits efficient crushing and screening (sizing) of the rock by the plant's equipment. Almost all of the energy in a properly designed blast is used for this purpose. A very small fraction of the total blast energy, however, is dissipated in the form of vibrations traveling outward from the blast location through both the ground and the air. These vibrations can be of concern to persons living in the vicinity of the quarry, and the

vibrations can result in complaints or, in extreme cases, in claims of damage to structures.

Excessive ground vibration indicates an inefficient blasting operation due to wasted explosive energy. From a public relations point of view, the smaller the vibration levels the less the likelihood of complaints. From an operational standpoint, the quarry operator wants maximum utilization of explosive energy in breaking up the rock. Explosive materials are expensive commodities, and energy from their use, which is dissipated in the form of air or ground vibrations, represents an economic loss. In short, efficient blasting benefits both the operator and his neighbors.

Blast Vibrations: A blast produces vibrations which radiate outward through the ground in all directions, primarily along the ground surface. The radiation of vibrations outward is analogous to what happens when a rock is dropped into a body of water, resulting in ripples radiating outward from the point of impact. However, two important differences exist: (1) the water ripples can be seen, whereas the ground displacement is generally limited to a few thousandths of an inch at most and therefore is not visible; and (2) in the case of water ripples the distance between successive waves (wave length) is measured in inches or a few feet at most, depending upon the size of rock hitting the water; the wave length of the ground motion is measured in hundreds of feet.

Particle Velocity: A major concern is what happens when the ground vibrations reach and pass by a building or other structure. The vibrations cause the ground at a given point and as a result the structure at that point to oscillate briefly back and forth, up and down, and side to side. Research in blasting seismology dating back to the 1920s shows that structural damage does not correlate with the amount of movement (particle displacement) to which the structure is subjected.^{7,8} Damage is related instead to the rate of ground movement, which is called *particle velocity*. Recent authoritative studies stress the point that, with regard to the possibility of damage, "*particle velocity is still the best ground motion descriptor.*"⁷ Particle velocity should not be confused with seismic velocity. Particle velocity is the rate of movement at a specific location produced by passing ground vibrations. Seismic velocity is the speed at which vibrations travel through the ground, usually measured in thousands of feet per second.

Vibration Intensity: Other similarities exist in the ground motion/water ripple analogy. The intensity of the vibration almost always decreases with increasing distance from a blast or from the point where the rock hits the water surface. In addition, blasts are usually detonated with one of a number of available delay systems. These produce very short time delays, commonly 8 to 50 milliseconds, between the detonation of individual blast holes or groups of holes. Seismological studies^{7,9} have shown that such delay systems produce

a significant reduction in vibration intensity. Accordingly, peak particle velocity is correlated, not with the total amount of explosive materials in a blast, but instead with the number of holes detonated per delay (max. holes/delay) and the charge weight contained in those holes (max. lb/delay). This concept can perhaps be better understood by considering the water wave analogy. A much larger wave is generated by a single rock striking the water than is caused by dividing the rock into a number of pieces and rapidly dropping the pieces into the water over a short period of time.

Low Frequency Sites: The blast design factors discussed in the previous paragraph may not be as effective in controlling vibration intensity when the overburden at and in the vicinity of a quarry is relatively deep (20 ft. or more) and/or consists of loosely consolidated material. The same is true at comparatively long distances from a blast. These situations tend to produce low vibration frequencies. A recent Bureau of Mines study¹⁰ suggests that, under these circumstances, "*the widely-used blast design criteria of 8 ms minimum delay separation may not be sufficiently long for sites with abnormally low frequencies.*" Geologic structure becomes the primary factor in determining vibration characteristics including both frequency and amplitude. Specialized studies may be required to evaluate the effectiveness of vibration control measures such as establishing a vertical seismic profile, conducting a detailed refraction survey, and/or monitoring a test blast at a very large number of sites at various distances and in many directions.

Allowable Vibration Limits: The limits imposed by many states and local jurisdictions on ground motion and airblast produced at structures in the vicinity of blasting operations are usually based upon recommendations of the United States Bureau of Mines.⁷ The recommended limits on particle velocity vary according to ground vibration frequency expressed in cycles per second, or *hertz* (Hz). This dependency is based on the fact that ground motion occurring at frequencies close to the natural frequencies of structures is more likely to cause damage than ground motion taking place at a frequency significantly different than the natural frequency of the structure. The *natural frequency* of a structure is the frequency at which the structure would vibrate if it is displaced a small amount and then allowed to freely vibrate; a structure has more than one natural frequency. Typical natural frequency ranges for residential structures as found by Medearis¹¹ are:

- 1 story: 8-18 Hz
- 1½ story: 7-14 Hz
- 2 story: 4-11 Hz

Criteria: The primary and most easily applied recommendations of the U.S. Bureau of Mines are given in Table 5.1. When the vibration pattern (frequency) is relatively constant, the above standards are easily applied. Occasionally, however, the peak particle velocity occurs

Table 5.1 Safe Levels of Blasting Vibrations for Residential Type Structures

Type of Structure	Ground vibration—peak particle velocity, in./sec	
	At low frequency (<40 Hz)	At high frequency (>40 Hz)
Modern homes, drywall interiors	0.75	2.0
Older homes, plaster on wood lath construction for interior walls	0.50	2.0

at a frequency of 40 Hz or higher followed by a wave train at lower frequencies. The peak at the lower frequency then must be compared with either the 0.50 or 0.75 in./sec limit depending upon which one is applicable.

Because of the discontinuity in recommended limits at 40 Hz, as shown in Table 5.1, the U.S. Bureau of Mines developed alternative criteria in which the recommended particle velocity maxima vary directly with frequency over the ranges of 1 to 2.7 Hz and 15 to 40 Hz. These criteria are illustrated in Figure 5-10. In the frequency ranges cited, the vibration limits are constant particle displacements of 0.030 in. and 0.008 in., respectively. The specific particle velocity (PV) limit in these frequency ranges can be calculated from the equation

$$PV = 2\pi fA \quad (5-1)$$

where A is the appropriate displacement limit and f is the measured frequency. Representative calculated particle velocity limits are 1.0 in./sec at a frequency of 20 Hz and 1.75 in./sec at 35 Hz.

The limits recommended by the U.S. Bureau of Mines, from 0.50 to 2.0 in./sec depending on the vibration frequency, provides protection in more than 95% of the cases. The damage probability refers to the percentage of homes that could sustain threshold damage at these vibration levels, which is less than 5%. The above limits are considered to be reasonable operating parameters. As vibration levels decrease from these limits, the data suggest that the no damage level is reached quickly, at approximately 0.4 in./sec for low frequency motion.

Also note that the 0.50 in./sec limit is lower than levels at which damage was observed. The lowest level at which a minor crack extension in drywall occurred was 0.79 in./sec. Further, there were many observations of no damage at particle velocities up to 3.0 in./sec.⁷

Repeated Blasting: The question as to the effect of repeated blasting frequently arises, i.e., will more damage occur at lower vibration levels with continuous blasting than with a single blast. The U.S. Bureau of Mines investigated this possibility by subjecting a

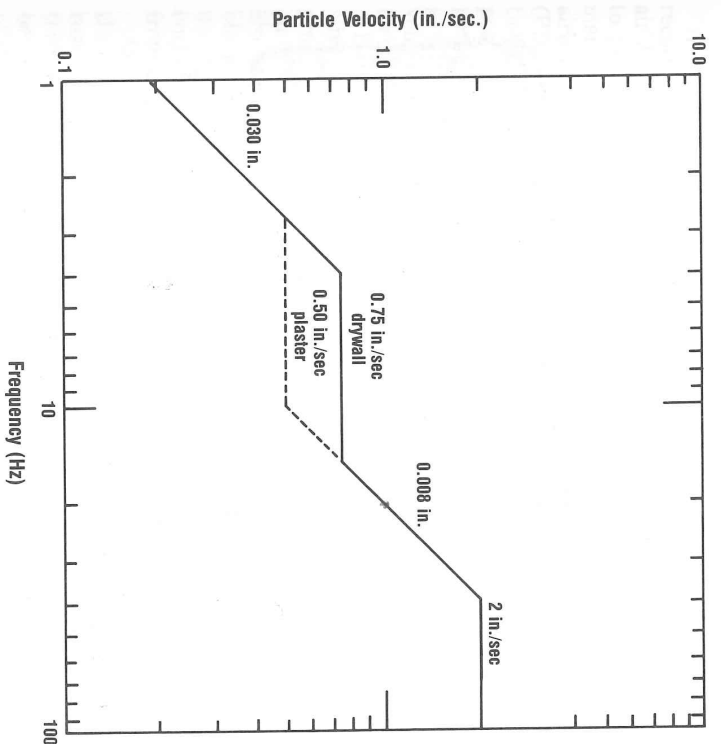


Figure 5.10 Safe levels of blasting vibration using a combination of velocity and displacement.

commercially built test home to particle velocities of 0.10 to 6.94 in./sec as blasting approached the home over a two-year period.⁸ The fatigue factor was further studied by mechanically shaking the building. The conclusions of this study are:

1. When particle velocities were maintained below 1.0 in./sec the rate of cracking in the building was the same during periods of no blasting as during those times when blasting was taking place.
 2. In the shaking tests, the first crack appeared after 56,000 cycles of motion, the equivalent of 28 years of shaking twice per day of blast-produced particle velocities of 0.50 in./sec.
 3. Human activity and changes in temperature and humidity produced strains in the walls equivalent to those produced by particle velocities of up to 1.2 in./sec.
- Vibration Monitoring Instrumentation:** Blasting vibrations are monitored with instruments especially designed for this purpose. A

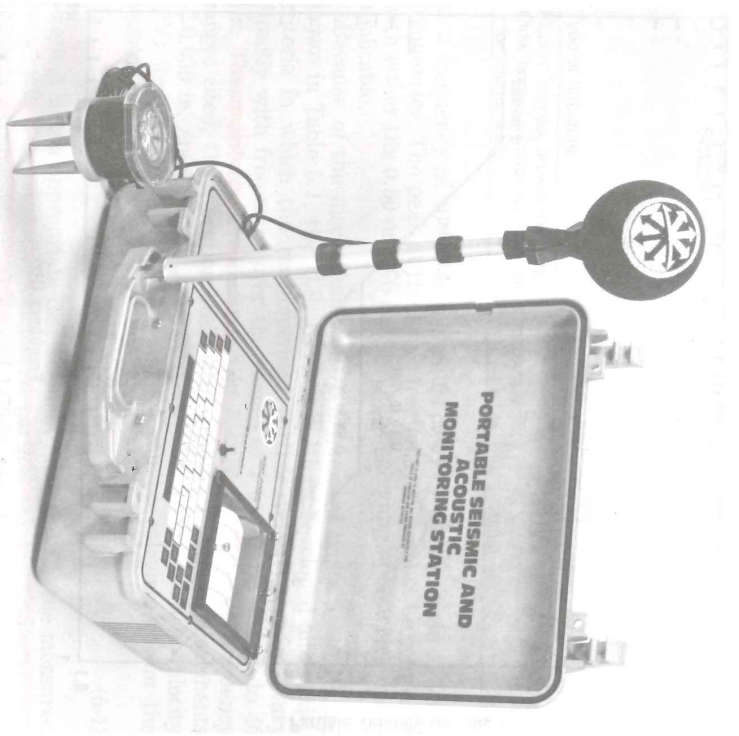


Figure 5.11 A typical recording system used to monitor ground motion and air overpressure.

typical recording system used to monitor ground motion as well as air overpressure is shown in Figure 5.11. A seismic recording system consists of two elements: the *seismometer* or *seismic pick-up unit* and the *recorder*, which is now usually computerized. The seismic pick-up unit, shown in the left foreground of Figure 5.11, contains three velocity-type transducers oriented at right angles to each other. To record a blast, the seismic pick-up unit is set up so that one transducer responds to the horizontal component of motion along the line between the blast and the seismograph; this is referred to as the longitudinal (L) or radial component. A second transducer responds to horizontal motion at right angles to the longitudinal (L) direction and is called the transverse (T) direction, while the third responds to vertical (V) motion. Thermal printers, pen and ink recorders, and disk or tape recorders are all used by various manufacturers to produce permanent seismic recordings.

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A representative seismic record is shown in Figure 5.12. This record contains the three seismic traces and a fourth portraying airblast intensity. Seismic trace amplitudes are directly proportional to particle velocity. In addition to the waveform record, this instrument also provides computer analysis of vibration intensity and airblast with peak values of particle velocity (PPV), displacement (PD), acceleration (PPA), and airblast being printed out. The vibration frequencies (F_{vib}) in Hz corresponding to the peak values and the peak resultant velocity (RPPV) are also given. Such recordings permit direct comparison with recommended or mandated limits on ground motion and air concussion. Observe that the peak particle velocity of 0.71 in./sec shown in Figure 5.12 exceeds the limit recommended for plaster-on-lath construction.

Damage To Underground Facilities: While blasting concerns usually focus on the possibility of damage to homes and other above-ground buildings and structures, concern about the effects of blasting on underground facilities such as pipelines, water wells, and sewers is also common. In general, underground facilities are far less susceptible to vibration damage than above-ground structures. Damage is usually associated with permanent displacement of the soil or rock enclosing the facility; this usually occurs only within about 20 to 30 ft. from a blast.^{12,13,14}

Air Concussion and Noise: In addition to vibration traveling through the ground, blasting also produces airborne vibrations, represented by transient increases in atmospheric pressure, commonly termed *overpressure*, *concussion*, or *noise*. These airborne waves can be broken down into two types: (1) the *noise that is heard*—that part of the air wave being transmitted at frequencies *in the audible range*, which is *above 20 to 25 Hz* and (2) the *concussion transmitted at lower inaudible frequencies*. *Concussion can rattle windows and doors and occasionally produce perceptible movement inside buildings.*

Decibel Scale: The range of overpressures to which the human ear is commonly subjected is extremely large. Rather than compare noise/concussion levels in these units, it is far more convenient to use the *logarithmic decibel scale*. With the latter, an increase of *20 decibels represents a 10-fold increase in overpressure*. Comparing 140 decibels with 0 decibels, for example, the increase is from 2.9×10^{-9} psi to 2.9×10^{-2} psi, a ratio of 10 million to 1. The conversion of overpressure in psi to decibels (dB) is given by the equation

$$dB = 20 \log_{10} [P/(2.9 \times 10^{-9})] \quad (5-2)$$

where P is the measured overpressure in psi.

Blast noise measurements are stated in dBL, where the L signifies that the response of the monitoring equipment is uniform or flat down through both the audible and inaudible range of frequencies. The most sensitive seismic research equipment possesses a flat response

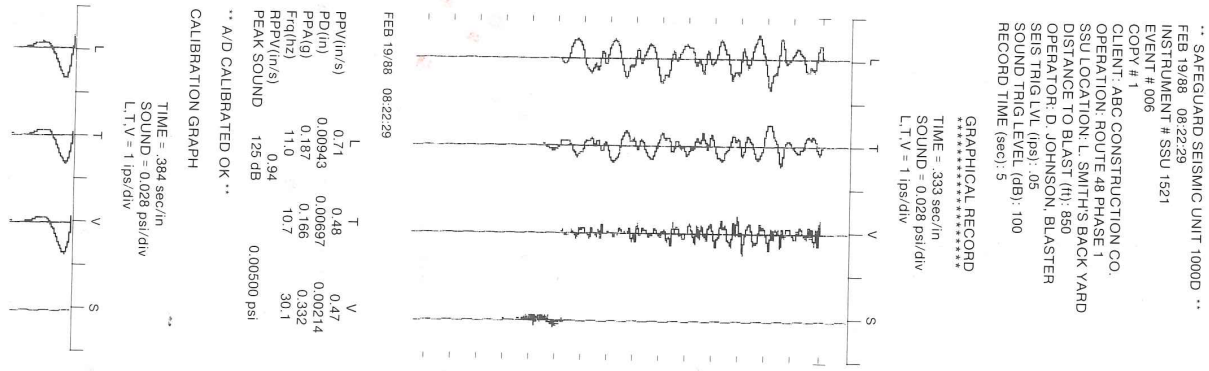


Figure 5.12 A representative seismographic record.

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Aggregate Handbook

down to a frequency of 0.1 Hz, while commercially available instruments have a uniform response down to 2 or 6 Hz.

Limits on Airblast: A U.S. Bureau of Mines report¹⁵ gives recommended limits on airblast which are widely recognized and often used in state and local regulations. Safe levels were found to be 134 dB (for equipment with flat response to 0.1 Hz), 132 dB (flat to 2 Hz), and 129 dB (flat to 6 Hz). From a practical viewpoint, therefore, recommended upper limits are either 133 or 129 dB, depending upon whether the instrument employed has a flat response down to 2 Hz or 6 Hz, respectively.

The Bureau's recommended limits are conservative. In the same report, the authors note "there is a consensus (in the reports of other investigators) that damage is improbable below 0.030 psi (140 dB)." Damage refers to broken windows, the components of buildings which are most susceptible to excessive overpressure.

Damaging overpressures are rarely encountered with modern blasting procedures. Confinement of explosives within the rock minimizes the effect of overpressures. In days gone by a common method of breaking up large boulders was to place a piece of dynamite on the boulder, cover it with mud, and then detonate the charge. This procedure results in excessive overpressure. Boulders are now usually reduced in size using a drop ball, which is a large steel weight dropped on the rock. Infrequently boulders are broken using a small explosive charge placed in holes drilled in the rock.

In summary, it is not difficult to conduct blasting operations in a quarry so that homes in the surrounding area are protected from damage. Well documented and widely recognized limits on ground motion and air concussion can be used to achieve this necessary goal.

Noise

A major environmental consideration associated with the operation of an aggregate plant is the noise generated by the operating equipment and the reaction to this noise by persons living or working in the vicinity. This discussion is concerned with steady-state noise, which is continuous or semi-continuous during the periods while the plant is in operation. Noise of transient or short duration character, such as that produced by blasting operations, was discussed in the previous section.

Measurement Equipment: Sound or noise consists of pressure waves traveling through the air producing temporary increases in atmospheric pressure to which the human ear responds. The human ear discriminates against certain sound frequencies. For example, sounds at frequencies less than 20 to 25 Hz are inaudible. Noise measurements to assess human reaction are made with equipment designed to duplicate as closely as possible the frequency response of

Environmental and Community Concerns

5-25

ESTERSON Sarah * ODOE

From: WANG Yumei * DGMI
Sent: Tuesday, April 16, 2019 12:05 PM
To: ESTERSON Sarah * ODOE
Cc: WANG Yumei * DGMI
Subject: EFSC B2H, blasting and landslide hazards

Hi Sarah,

Here's a single email:

For site-specific landslide hazard evaluations, DOGAMI considers the below references as important. The first reference, SLIDO, should be used as part of a literature review of existing mapped landslides. Keep in mind that many areas of Oregon have not been mapped. As such, the absence of mapped landslides on SLIDO does not mean that there are no landslides in that area.

DOGAMI considers the method outlined in special paper 42 as the state-of-practice method. This includes using lidar as the base map. If existing active landslides are identified, the further analyses would be warranted including field investigation. And, shallow and/or deep landslide susceptibility using methods outlined in special papers 45 and 48 may be warranted. I have included links to these for your convenience.

- I. **Statewide Landslide Information Database for Oregon (SLIDO)**
<https://www.oregongeology.org/slido/index.htm>
- II. **Special Paper 42, Protocol for Inventory Mapping of Landslide Deposits from Light Detection and Ranging (Lidar) Imagery**, 2009, by William J. Burns and Ian P. Madin.
<https://www.oregongeology.org/pubs/sp/p-SP-42.htm>
- III. **Special Paper 45, Protocol for Shallow-Landslide Susceptibility Mapping**, 2012, by William J. Burns, Ian P. Madin, and Katherine A. Mickelson.
<https://www.oregongeology.org/pubs/sp/p-SP-45.htm>
- IV. **Special Paper 48, Protocol for deep landslide susceptibility mapping**, 2016, by William J. Burns and Katherine A. Mickelson
<https://www.oregongeology.org/pubs/sp/p-SP-48.htm>

Here's what I found out about blasting:

The Oregon State Fire Marshal has jurisdiction over storage of explosives. But, they do not regulate the actual blasting activities.

The National Fire Protection Association has codes on blasting via NFPA 495
<https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=495>

Certain local jurisdictions may have requirements that would need to be satisfied.

Here's an example of what you might request. See #1, 2 and 3 from the below link:
<https://www.tvfr.com/DocumentCenter/View/1704/Explosive-Blasting-Permit-Info?bidl=>

If you have further questions on the blasting, I would likely refer you to my co-worker Bob Brinkman (and let me know if you want his contact info. I can e-introduce you).

Yumei

Yumei Wang, P.E. | Resilience Engineer
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Unless otherwise indicated, all information in this correspondence is classified as Level 1, "Published" according to State of Oregon statute and administrative policy.

Tualatin Valley Fire & Rescue Explosive Blasting Permits



North Operating Center

11945 SW 70th Avenue
Tigard, OR 97223
Phone: 503-649-8577
Fax: 503-642-4814

South Operating Center

8445 SW Elligsen Road
Wilsonville, OR 97070
Phone: 503-259-1500
Fax: 503-259-1520

Tualatin Valley Fire & Rescue requires a permit to be issued for any type of explosive blasting conducted within District boundaries. **In order to receive a permit, a complete packet must be submitted at least 14 days prior to blasting.**

The packet must include the following:

1. **Oregon State Fire Marshal (OSFM) Certificate to Possess Explosives** in the State of Oregon.
 2. **Blasting Plan** prepared in accordance with 2018 NFPA 495 and industry standards. It must include:
 - a. Explosives delivery information
 - b. Explosives storage information (magazine, location and responsible person)
 - c. Drilling information
 - d. Explosives products and loading information
 - e. Safety procedures
 - f. Directions for pre-blast notification and proper posting in area of work (350' minimum).
 - g. Verification of contact with city (if applicable), county, and local police or sheriff agency where work is being performed to determine if additional requirements apply.
 - h. Pre-blast survey of any structures, within 300' of the blast site unless the Blaster-in-Charge determines a greater distance is necessary.
 - i. A monitoring plan to identify how seismic monitoring will be conducted to ensure ground vibration does not exceed the maximum limit in 2018 NFPA 495 Figure 11.2.1 at the nearest structures or buildings.
 - j. Where seismic monitoring is not provided, explosive use shall be limited to the "scaled distance factors" at the nearest structure as identified in 2018 NFPA 495 Table 11.2.2.
 - k. Post blast monitoring and seismic report. Provide a copy to TVFR when requested.
- Note: Blasting operations shall be overseen by a Blaster-in-Charge qualified to perform such work.*
3. **Bond or insurance certificate** for the project in an amount not less than \$1,000,000. The Fire Marshal may determine that more coverage is necessary for certain projects.
 4. **TVF&R Permit Application** obtained by:
 - a. Visiting our website at www.tvfr.com (click on Online Resources)
 - b. Contacting the nearest Operating Center

For more information, contact TVF&R Fire Marshal's Office at 503-259-1500.

ESTERSON Sarah * ODOE

Subject: FW: B2H Reveg Success Criteria Review

From: Sarah J Reif <Sarah.J.Reif@state.or.us>
Sent: Monday, June 29, 2020 3:41 PM
To: ESTERSON Sarah * ODOE <Sarah.Esterson@oregon.gov>
Subject: RE: B2H Reveg Success Criteria Review

Hi Sarah –

I spoke with Nigel on Friday, and we have some clarifications that might be helpful as you wrap up your B2H proposed order.

- The 70% native bunchgrass criterion was indeed a relic of sage-grouse recommendations, and we both agreed it doesn't really make sense in more generalized habitats. Our apologies for the confusion in our earlier recommendations.
 - Instead, we recommend success criteria be made more similar to what we've recommended on other EFSC projects: Percent cover of grass, forb, shrub, tree be equal to – or greater than – percent cover of paired control sites.
- Paired control sites should be of similar ecological site conditions to the areas of temporary disturbance, and we recommend IPC seek concurrence from ODOE (ODFW) on the location of the paired control sites **prior to** disturbance (so that control site data can be compared with pre-disturbance data). Essentially we're trying to avoid a situation where poor-quality control sites are established, therefore setting a very low bar for success. I think the reveg plan's intent was to establish these control sites prior to disturbance, but it wasn't entirely clear.
- We find the percentage goals listed in the table below set a very low bar that will not equate to replacement of lost habitat. For example, a site with 40% grass and 60% bare ground would only need to be revegetated to 20% grass, 80% bare ground? This does not amount to replacement of lost habitat. Did you mention in our last call that IPC was offering additional mitigation to account for this lost habitat? If so, can you point me to where this is explained in their application?
- The 15% sagebrush recommendation is indeed specific to sage-grouse, but should apply anywhere you have sagebrush as it is a number indicative of a healthy sagebrush system. So this would be the one % cover recommendation that might be in addition to the percent cover recommendation above.
 - So, for example. If you have a paired control site with 60% native bunchgrass, 10% sagebrush, 20% litter, and 10% bare ground. In your reveg area, you should be shooting for at least 60% native bunchgrass and at least 15% sagebrush, the rest can be litter and bare ground. Let me know if that does not make sense.
- We recommend that desirable species be defined. It should be mostly native, but we can imagine situations where a non-native grass might be desirable in an effort to out-compete cheatgrass (e.g., crested wheatgrass is often used to preclude establishment of invasive annuals), but the species and situations should be developed in coordination with ODOE (ODFW).

Let me know if you have additional questions. Thanks for the coordination.

Sarah Reif
ODFW Energy Coordinator
o:503-947-6082; m: 503-991-3587

ESTERSON Sarah * ODOE

Subject: FW: Sandhill Crane Travel Routes - B2H
Attachments: Sandhill Crane Travel Routes 1.jpg; Sandhill Crane Travel Routes 2.jpg; Sandhill Crane Travel Routes 3.jpg

From: Cathy Nowak
Sent: Monday, August 12, 2019 3:34 PM
To: Sarah J Reif <Sarah.J.Reif@coho2.dfw.state.or.us>; Kyle W Martin <Kyle.W.Martin@coho2.dfw.state.or.us>
Cc: Bruce Eddy <Bruce.R.Eddy@coho2.dfw.state.or.us>; Jeff Yanke <Jeff.Yanke@coho2.dfw.state.or.us>; Nick Myatt <Nick.A.Myatt@coho2.dfw.state.or.us>; 'Nigel E Seidel' <nigel.e.seidel@state.or.us>
Subject: RE: Sandhill Cranes

Sarah,

In response to your email, below, I have created a map of simplified representative sandhill crane travel routes to and from Ladd Marsh Wildlife Area and the Grande Ronde Valley using Satellite telemetry data from 5 different sandhill cranes. The maps use the following line colors:

- Red = a generalized representation of the proposed route of the B2H power line.
- Shades of green = spring travel routes of migrating sandhill cranes returning to the area from wintering sites.
- Shades of orange/yellow = fall travel routes of sandhill cranes leaving the area enroute to wintering sites.
- Shades of blue = exploratory travels of 2 newly independent sub-adult sandhill cranes and summer movements of one representative adult post-breeding sandhill crane.

The three maps show a successively higher elevation view beginning with one zoomed in to Ladd Marsh and working out to include much of Baker and Union Counties. The travel lines are abbreviated to show only the birds' movements relevant to the proposed line.

These telemetry data are a simple representation of the likely movement of hundreds of sandhill cranes that move through the valley and the Ladd Marsh Wildlife Area during spring and fall migrations as well as during the summer nesting season. The maps include a line of travel (in sort of mint green) that comes in from the southeast. This represents a sandhill crane that winters in the lower Colorado River Valley, travels to the Payette River Valley in Idaho, then north and west to Ladd Marsh. This route is reversed in fall. It is the one bird we know of, possibly representing others, that may not cross the powerline route.

The largest flock of migrating sandhill cranes I have seen on the wildlife area numbered about 700 birds. These were largely lesser sandhill cranes belonging to the Central Valley Population which winters in California's Central Valley. All of those birds would have had to cross the proposed route of the B2H line at some point. They almost certainly do so every year.

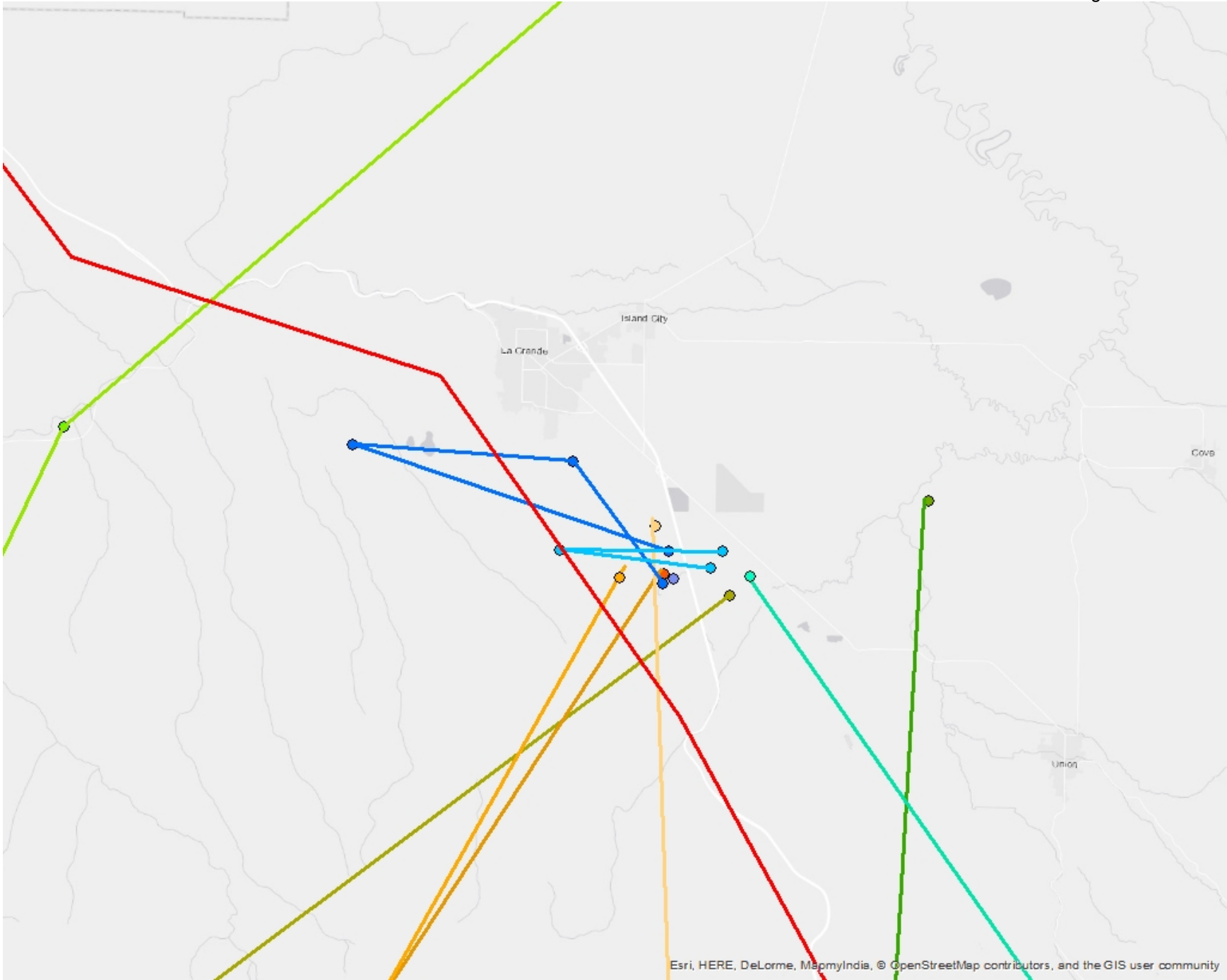
Given a high level of concern regarding sandhill crane mortality due to collisions with transmission power lines (Birds of North America Online), I believe these data support a request for mitigation measures, in the form of UV lights on the lines, along the B2H transmission line from central Baker County to the Umatilla County line.

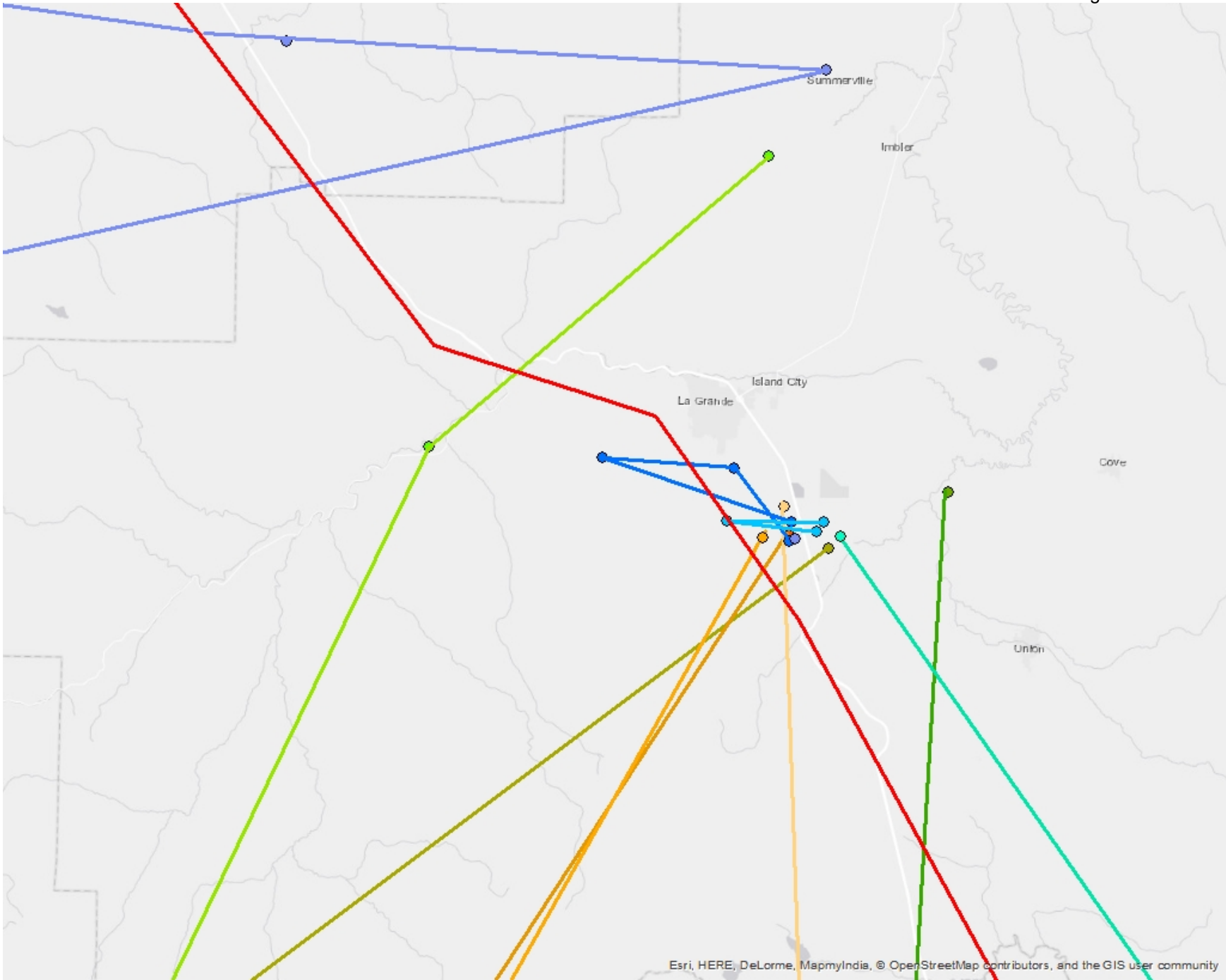
If more detailed data are useful, I do have the raw telemetry data for numerous migrations by several sandhill cranes.

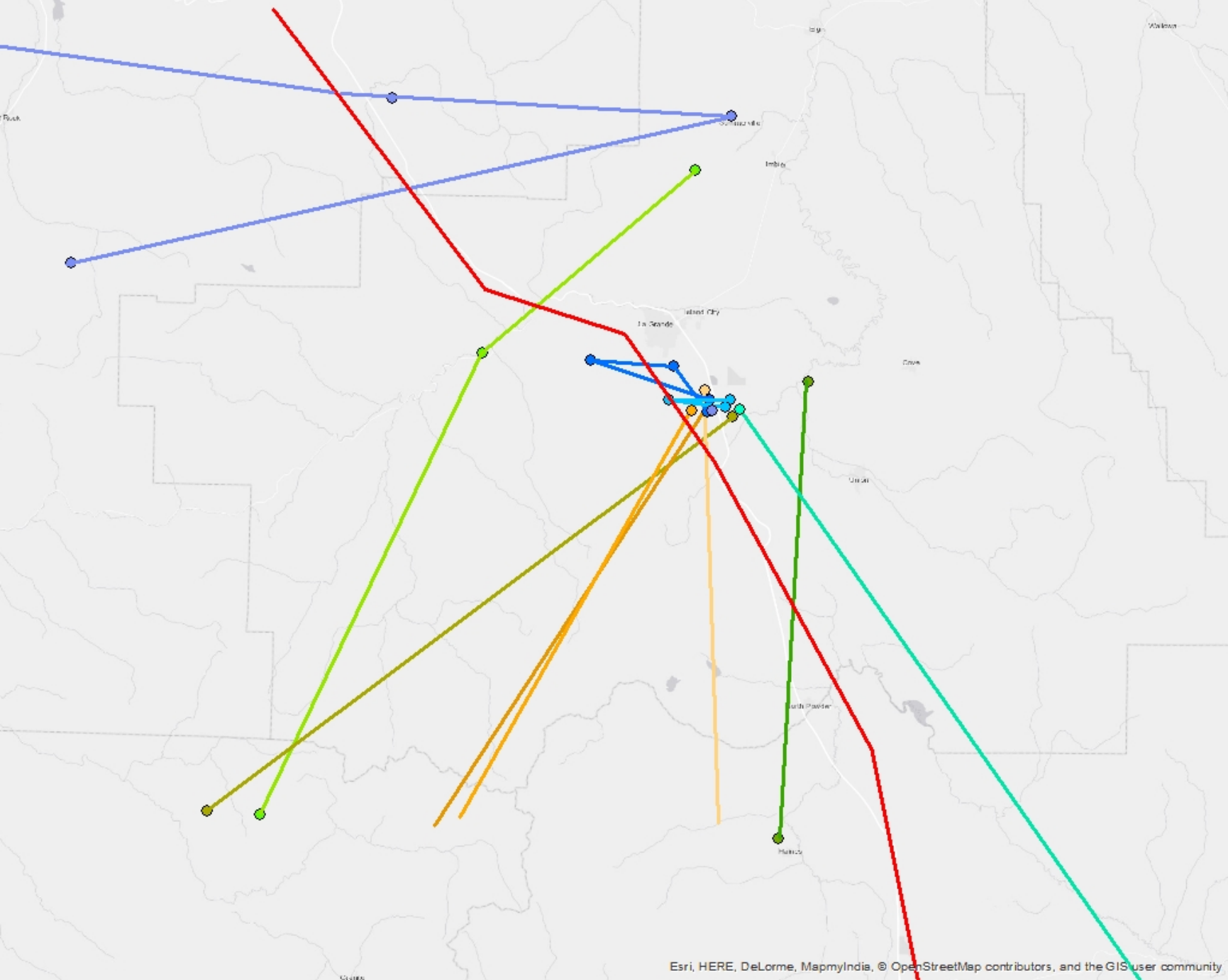
I hope this information is of use,

M. Cathy Nowak

Certified Wildlife Biologist
Ladd Marsh Wildlife Area
59116 Pierce Rd
La Grande, OR 97850
541-963-4954







ESTERSON Sarah * ODOE

Subject: FW: B2H DPO Comments on F&W Condition 17
Attachments: B2HAPP DPO FW Condition 17 (ODFW Edits).docx; Connelly et al. 2000 Habitat guidelines.pdf; Davies_etal_2019_postwildfire seeding to restore native vegetation and limite exotic annuals_an evaluation in juniper-dominated sagebrush steppe.pdf

From: Nigel E Seidel <Nigel.E.Seidel@state.or.us>
Sent: Monday, September 23, 2019 3:02 PM
To: ESTERSON Sarah * ODOE <Sarah.Esterson@oregon.gov>
Subject: RE: B2H DPO Comments on F&W Condition 17

Ok, I have made a few minor edits to Condition 17. I feel the condition edits require some additional description in DPO language which I included as a comment on the attached Condition 17 Word Doc. Let me know if you need some additional discussion/clarification.

I have attached 2 journal articles to supplement the revegetation/reclamation success criteria ODFW proposed for sage-grouse. The attached Davies paper implicitly supports 5 PG/m² from the standpoint of elimination of invasive weeds and not the biological need of sage-grouse. That being said, a plant density of 5 PG/m² is completely conducive to sage-grouse use. The Connelly et al. habitat guidelines show that 10 – 25% sagebrush canopy cover is optimal for sage-grouse. However we are making the assumption that replanting sagebrush to the 15% level is sufficient and will allow for natural regeneration to take place from the seeded plants.

I hope this helps and let me know if you have additional questions/comments.

Cheers
Nigel

Nigel Seidel
Sage-Grouse Mitigation Coordinator
Oregon Department of Fish & Wildlife
4034 Fairview Industrial Dr SE
Salem, OR 97302
Office: 503-947-6074
Cell: 971-719-6015



Habitat and Management

SAGE GROUSE MANAGEMENT

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Guidelines to manage sage grouse populations and their habitats

*John W. Connelly, Michael A. Schroeder, Alan R. Sands, and
Clait E. Braun*

Abstract The status of sage grouse populations and habitats has been a concern to sportsmen and biologists for >80 years. Despite management and research efforts that date to the 1930s, breeding populations of this species have declined throughout much of its range. In May 1999, the western sage grouse (*C. urophasianus phaios*) in Washington was petitioned for listing under the Endangered Species Act because of population and habitat declines (C. Warren, United States Fish and Wildlife Service, personal communication). Sage grouse populations are allied closely with sagebrush (*Artemisia* spp.). Despite the well-known importance of this habitat to sage grouse and other sagebrush obligates, the quality and quantity of sagebrush habitats have declined for at least the last 50 years. Braun et al. (1977) provided guidelines for maintenance of sage grouse habitats. Since publication of those guidelines, much more information has been obtained on sage grouse. Because of continued concern about sage grouse and their habitats and a significant amount of new information, the Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under the direction of the Western Association of Fish and Wildlife Agencies, requested a revision and expansion of the guidelines originally published by Braun et al. (1977). This paper summarizes the current knowledge of the ecology of sage grouse and, based on this information, provides guidelines to manage sage grouse populations and their habitats.

Key words *Artemisia*, *Centrocercus urophasianus*, guidelines, habitat, management, populations, sage grouse, sagebrush

The status of sage grouse populations and habitats has been a concern to sportsmen and biologists for >80 years (Hornaday 1916, Patterson 1952, Autenrieth 1981). Despite management and research efforts that date to the 1930s (Girard 1937), breeding populations of this species have declined by at least 17–47% throughout much of its range (Connelly and Braun 1997). In May 1999, the western sage grouse (*C. urophasianus phaios*) in Washington was petitioned for listing under the

Endangered Species Act because of population and habitat declines (C. Warren, United States Fish and Wildlife Service, personal communication).

Sage grouse populations are allied closely with sagebrush (*Artemisia* spp.) habitats (Patterson 1952, Braun et al. 1977, Braun 1987). The dependence of sage grouse on sagebrush for winter habitat has been well documented (Eng and Schladweiler 1972, Beck 1975, Beck 1977, Robertson 1991). Similarly, the relationship between sagebrush

Address for John W. Connelly: Idaho Department of Fish and Game, 1345 Barton Road, Pocatello, ID 83204, USA; e-mail: JCsagegrouse@gateway.net. Address for Michael A. Schroeder: Washington Department of Fish and Wildlife, P.O. Box 1077, Bridgeport, WA 98813, USA. Address for Alan R. Sands: Bureau of Land Management, 1387 S. Vinnell Way, Boise, ID 83709-1657, USA; present address: The Nature Conservancy, 2404 Bank Drive, Suite 314, Boise, ID 83705, USA. Address for Clait E. Braun: Colorado Division of Wildlife, Wildlife Research Center, 317 W. Prospect Road, Fort Collins, CO 80526, USA; present address: Grouse Inc., 5572 North Ventana Vista Road, Tucson, AZ 85750-7204, USA.



Sage grouse on a nest with good shrub and herbaceous cover. The nest was successful.

habitats and sage grouse nest success has been described thoroughly (Klebenow 1969, Wallestad and Pyrah 1974, Wakkinen 1990, Connelly et al. 1991, Gregg et al. 1994). Despite the well-known importance of this habitat to sage grouse and other sagebrush obligates (Braun et al. 1976, Saab and Rich 1997), the quality and quantity of sagebrush habitats have declined for at least the last 50 years (Braun et al. 1976, Braun 1987, Swenson et al. 1987, Connelly and Braun 1997).

Braun et al. (1977) provided guidelines for maintenance of sage grouse habitats. Since publication of those guidelines, much more information has been obtained on relative size of sagebrush habitats used by these grouse (Connelly 1982, Connelly et al. 1988, Wakkinen et al. 1992), seasonal use of sagebrush habitats (Benson et al. 1991, Connelly et al. 1991), effects of insecticides on sage grouse (Blus et al. 1989), importance of herbaceous cover in breeding habitat (Wakkinen 1990, Connelly et al. 1991, Gregg 1991, Barnett and Crawford 1994, Drut et al. 1994a, Gregg et al. 1994), and effects of fire on their habitat (Hulet 1983; Benson et al. 1991;

Robertson 1991; Fischer 1994; Fischer et al. 1996a, 1997; Pyle and Crawford 1996; Connelly et al. 2000b). Because of continued concern about sage grouse and their habitats and a significant amount of new information, the Western States Sage and Columbian Sharp-tailed Grouse Technical Committee, under the direction of the Western Association of Fish and Wildlife Agencies, requested a revision and expansion of the guidelines originally published by Braun et al. (1977). This paper summarizes the current knowledge of the ecology of sage grouse and, based on this information, provides guidelines to manage sage grouse populations and their habitats.

Population biology

Seasonal movements and home range

Sage grouse display a variety of annual migratory patterns (Beck 1975, Wallestad 1975, Hulet 1983, Berry and Eng 1985, Connelly et al. 1988, Wakkinen 1990, Fischer 1994). Populations may have: 1) distinct winter, breeding, and summer areas; 2) distinct summer areas and integrated winter and breeding areas; 3) distinct winter areas and integrated breeding and summer areas; or 4) well-integrated seasonal habitats (nonmigratory populations). Seasonal movements between distinct seasonal ranges may exceed 75 km (Dalke et al. 1963, Connelly et al. 1988), which complicates attempts to define populations. Thus, Connelly et al. (1988) suggested that sage grouse populations be defined on a temporal and geographic basis. Because of differences in seasonal movements among populations (Dalke et al. 1963, Wallestad 1975, Connelly et al. 1988, Wakkinen 1990), 3 types of sage grouse populations can



Sage grouse on a nest with poor shrub and herbaceous cover. This nest was unsuccessful. Photo by Jena Hickey.



Sage grouse on winter range. Note the relatively sparse cover; without snow, the canopy cover of sagebrush in this area exceeds 20%.

be defined: 1) nonmigratory, grouse do not make long-distance movements (i.e., >10 km one way) between or among seasonal ranges; 2) one-stage migratory, grouse move between 2 distinct seasonal ranges; and 3) 2-stage migratory, grouse move among 3 distinct seasonal ranges. Within a given geographic area, especially summer range, there may be birds that belong to more than one of these types of populations.

On an annual basis, migratory sage grouse populations may occupy areas that exceed 2,700 km² (Hulet 1983, Leonard et al. 2000). During winter, Robertson (1991) reported that migratory sage grouse in southeastern Idaho made mean daily movements of 752 m and occupied an area \geq 140 km². For a nonmigratory population in Montana, Wallestad (1975) reported that winter home range size ranged from 11 to 31 km². During summer, migratory sage grouse in Idaho occupied home ranges of 3 to 7 km² (Connelly and Markham 1983, Gates 1983).

Despite large annual movements, sage grouse have high fidelity to seasonal ranges (Keister and Willis 1986, Fischer et al. 1993). Females return to the same area to nest each year (Fischer et al. 1993) and may nest within 200 m of their previous year's nest (Gates 1983, Lyon 2000).

Survival

Wallestad (1975) reported that annual survival rates for yearling and adult female sage grouse were 35 and 40%, respectively, for poncho-tagged birds. However, Zablan (1993) reported that survival rates for banded yearling and adult females in Colorado were similar and averaged 55%; survival rates for

yearling and adult males differed, averaging 52 and 38%, respectively. In Idaho, annual survival of male sage grouse ranged from 46 to 54% and female survival from 68 to 85% (Connelly et al. 1994). Lower survival rates for males may be related to physiological demands because of sexual dimorphism and greater predation rates (Swenson 1986).

Reproduction

Bergerud (1988) suggested that most female tetraonids nest as yearlings. Although essentially all female sage grouse nested in Washington (Schroeder 1997), Connelly et al. (1993) reported that in Idaho up to 45% of yearling and 22% of adult female sage grouse do not nest each year. Gregg (1991) indicated that, of 119 females monitored through the breeding season in eastern Oregon, 26 (22%) did not nest. However, Coggins (1998) reported a 99% nest initiation rate for 3 years for the same population in Oregon. The differences may be related to improved range condition that resulted in better nutritional status of pre-laying hens (Barnett and Crawford 1994).

Estimates of sage grouse nest success throughout the species' range vary from 12 to 86% (Trueblood 1954, Gregg 1991, Schroeder et al. 1999). Nest success also may vary on an annual basis (Schroeder 1997, Sveum et al. 1998a). Wallestad and Pyrah (1974) observed greater nest success by adults than yearlings. However, significant differences in nest success between age groups have not been reported in other studies (Connelly et al. 1993, Schroeder 1997).

Clutch size of sage grouse is extremely variable and relatively low compared to other species of gamebirds (Edminster 1954, Schroeder 1997). Average clutch size for first nests varies from 6.0 to



Sage grouse nest. Photo by Jena Hickey.

9.5 throughout the species' range (Sveum 1995, Schroeder 1997). Greatest and least average clutch sizes have been reported in Washington (Sveum 1995, Schroeder 1997).

Renesting by sage grouse varies regionally from <20% (Patterson 1952, Eng 1963, Hulet 1983, Connelly et al. 1993) to >80% (Schroeder 1997). Despite regional variation, differences in renesting rates due to age have not been documented (Connelly et al. 1993, Schroeder 1997). Because of variation in nest initiation, success, and renesting rates, the proportion of females successfully hatching a brood varies between 15 and 70% (Wallestad and Pyrah 1974, Gregg et al. 1994). Despite this variation, sage grouse generally have low reproductive rates and high annual survival compared to most gallinaceous species (Zablan 1993, Connelly et al. 1994, Connelly and Braun 1997, Schroeder 1997, Schroeder et al. 1999).

Little information has been published on mortality of juvenile sage grouse or the level of production necessary to maintain a stable population. Among western states, long-term ratios have varied from 1.40 to 2.96 juveniles/hen in the fall; since 1985 these ratios have ranged from 1.21 to 2.19 (Connelly and Braun 1997). Available data suggest that a ratio ≥ 2.25 juveniles/hen in the fall should result in stable to increasing sage grouse populations (Connelly and Braun 1997, Edelman et al. 1998).

Habitat requirements

Breeding habitats

Leks, or breeding display sites, typically occur in open areas surrounded by sagebrush (Patterson 1952, Gill 1965); these sites include, but are not limited to, landing strips, old lakebeds, low sagebrush flats and ridge tops, roads, cropland, and burned areas (Connelly et al. 1981, Gates 1985). Sage grouse males appear to form leks opportunistically at sites within or adjacent to potential nest-

ing habitat. Although the lek may be an approximate center of annual ranges for nonmigratory populations (Eng and Schladweiler 1972, Wallestad and Pyrah 1974, Wallestad and Schladweiler 1974), this may not be the case for migratory populations (Connelly et al. 1988, Wakkinen et al. 1992). Average distances between nests and nearest leks vary from 1.1 to 6.2 km, but distance from lek of female capture to nest may be >20 km (Autenrieth 1981, Wakkinen et al. 1992, Fischer 1994, Hanf et al. 1994, Lyon 2000). Nests are placed independent of lek location (Bradbury et al. 1989, Wakkinen et al. 1992).

Habitats used by pre-laying hens also are part of the breeding habitat. These areas should provide a diversity of forbs high in calcium, phosphorus, and protein; the condition of these areas may greatly affect nest initiation rate, clutch size, and subsequent reproductive success (Barnett and Crawford 1994, Coggins 1998).

Most sage grouse nests occur under sagebrush (Patterson 1952, Gill 1965, Gray 1967, Wallestad and Pyrah 1974), but sage grouse will nest under other plant species (Klebenow 1969, Connelly et al. 1991, Gregg 1991, Sveum et al. 1998a). However, grouse nesting under sagebrush experience greater nest success (53%) than those nesting under other plant species (22%, Connelly et al. 1991).

Table 1. Habitat characteristics associated with sage grouse nest sites.

State	Sagebrush		Grass		Reference
	Height ^a (cm)	Coverage (%) ^b	Height(cm)	Coverage(%) ^c	
Colo.	52				Petersen 1980
Id.		15		4	Klebenow 1969
Id.	58-79	23-38			Autenrieth 1981
Id.	71	22	18	3-10	Wakkinen 1990
Id.			19-23	7-9	Connelly et al. 1991
Id.	61		22	30	Fischer 1994
Id.		15-32	15-30		Klott et al. 1993
Id.	69	19	34	15	Apa 1998
Mont.	40	27			Wallestad 1975
Oreg.	80	20			Keister and Willis 1986
Oreg.		24	14	9-32	Gregg 1991
Wash.		20		51	Schroeder 1995
Wash.		19		32	Sveum et al. 1998a
Wyo.	36				Patterson 1952
Wyo.	29	24	15	9	Heath et al. 1997
Wyo.	31	25	18	5	Holloran 1999
Wyo.	33	26	21	11	Lyon 2000

^a Mean height of nest bush.

^b Mean canopy coverage of the sagebrush surrounding the nest.

^c Some coverage estimates may include both grasses and forbs.

Mean height of sagebrush most commonly used by nesting grouse ranges from 29 to 80 cm (Table 1), and nests tend to be under the tallest sagebrush within a stand (Keister and Willis 1986, Wakkinen 1990, Apa 1998). In general, sage grouse nests are placed under shrubs having larger canopies and more ground and lateral cover as well as in stands with more shrub canopy cover than at random sites (Wakkinen 1990, Fischer 1994, Heath et al. 1997, Sveum et al. 1998a, Holloran 1999). Sagebrush cover near the nest site was greater around successful nests than unsuccessful nests in Montana (Wallestad and Pyrah 1974) and Oregon (Gregg 1991). Wallestad and Pyrah (1974) also indicated that successful nests were in sagebrush stands with greater average canopy coverage (27%) than those of unsuccessful nests (20%). Gregg (1991) reported that sage grouse nest success varied by cover type. The greatest nest success occurred in a mountain big sagebrush (*A. t. tridentata vaseyana*) cover type where shrubs 40–80 cm in height had greater canopy cover at the site of successful nests than at unsuccessful nests (Gregg 1991). These observations were consistent with the results of an artificial nest study showing greater coverage of medium-height shrubs improved success of artificial nests (DeLong 1993, DeLong et al. 1995).

Grass height and cover also are important components of sage grouse nest sites (Table 1). Grass associated with nest sites and with the stand of vegetation containing the nest was taller and denser than grass at random sites (Wakkinen 1990, Gregg 1991, Sveum et al. 1998a). Grass height at nests under non-sagebrush plants was greater ($P < 0.01$) than that associated with nests under sagebrush, further suggesting that grass height is an important habitat component for nesting sage grouse (Connelly et al. 1991). Moreover, in Oregon, grass cover was greater at successful nests than at unsuccessful nests (Gregg 1991). Grass >18 cm in height occurring in stands of sagebrush 40–80 cm tall resulted in lesser nest predation rates than in stands with lesser grass heights (Gregg et al. 1994). Herbaceous cover associated with nest sites may provide scent, visual, and physical barriers to potential predators (DeLong et al. 1995).

Early brood-rearing areas occur in upland sagebrush habitats relatively close to nest sites, but movements of individual broods may vary (Connelly 1982, Gates 1983). Within 2 days of hatching, one brood moved 3.1 km (Gates 1983). Early brood-rearing habitats may be relatively open



Radiotelemetry and a pointing dog are used to capture sage grouse chicks for a research project in southeastern Idaho.

(about 14% canopy cover) stands of sagebrush (Martin 1970, Wallestad 1971) with $\geq 15\%$ canopy cover of grasses and forbs (Sveum et al. 1998b, Lyon 2000). Great plant species richness with abundant forbs and insects characterize brood areas (Dunn and Braun 1986, Klott and Lindzey 1990, Drut et al. 1994a, Apa 1998). In Oregon, diets of sage grouse chicks included 34 genera of forbs and 41 families of invertebrates (Drut et al. 1994b). Insects, especially ants (Hymenoptera) and beetles (Coleoptera), are an important component of early brood-rearing habitat (Drut et al. 1994b, Fischer et al. 1996a). Ants and beetles occurred more frequently ($P = 0.02$) at brood-activity centers compared to nonbrood sites (Fischer et al. 1996a).

Summer-late brood-rearing habitats

As sagebrush habitats desiccate, grouse usually move to more mesic sites during June and July (Gill 1965, Klebenow 1969, Savage 1969, Connelly and Markham 1983, Gates 1983, Connelly et al. 1988, Fischer et al. 1996b). Sage grouse broods occupy a variety of habitats during summer, including sagebrush (Martin 1970), relatively small burned areas within sagebrush (Pyle and Crawford 1996), wet meadows (Savage 1969), farmland, and other irrigated areas adjacent to sagebrush habitats (Connelly and Markham 1983, Gates 1983, Connelly et al. 1988). Apa (1998) reported that sites used by grouse broods had twice as much forb cover as independent sites.

Fall habitats

Sage grouse use a variety of habitats during fall. Patterson (1952) reported that grouse move from summer to winter range in October, but during

mild weather in late fall, some birds may still use summer range. Similarly, Connelly and Markham (1983) observed that most sage grouse had abandoned summering areas by the first week of October. Fall movements to winter range are slow and meandering and occur from late August to December (Connelly et al. 1988). Wallestad (1975) documented a shift in feeding habits from September, when grouse were consuming a large amount of forbs, to December, when birds were feeding only on sagebrush.

Winter habitats

Characteristics of sage grouse winter habitats are relatively similar throughout most of the species' range (Table 2). Eng and Schladweiler (1972) and Wallestad (1975) indicated that most observations of radiomarked sage grouse during winter in Montana occurred in sagebrush habitats with >20% canopy cover. However, Robertson (1991) indicated that sage grouse used sagebrush habitats that had average canopy coverage of 15% and average height of 46 cm during 3 winters in southeastern Idaho. In Idaho, sage grouse selected areas with greater canopy cover of Wyoming big sagebrush (*A. t. wyomingensis*) in stands containing taller shrubs when compared to random sites (Robertson 1991).

In Colorado, sage grouse may be restricted to <10% of the sagebrush habitat because of variation in topography and snow depth (Beck 1977, Hupp and Braun 1989). Such restricted areas of use may not occur throughout the species' range because in southeastern Idaho, severe winter weather did not result in the grouse population greatly reducing its seasonal range (Robertson 1991).

During winter, sage grouse feed almost exclusively on leaves of sagebrush (Patterson 1952, Wallestad et al. 1975). Although big sagebrush dominates the diet in most portions of the range (Patterson 1952; Wallestad et al. 1975; Remington and Braun 1985; Welch et al. 1988, 1991), low sagebrush (*A. arbuscula*), black sagebrush (*A. nova*, Dalke et al. 1963, Beck 1977), fringed sagebrush (*A. frigida*, Wallestad et al. 1975), and silver sagebrush (*A. cana*, Aldridge 1998) are consumed in many areas depending on availability. Sage grouse in some areas apparently prefer Wyoming big sagebrush (Remington and Braun 1985, Myers 1992) and in other areas mountain big sagebrush (Welch et al. 1988, 1991). Some of the differences in selection may be due to preferences for greater levels of protein and the amount of volatile oils (Remington and Braun 1985, Welch et al. 1988).

Effects of habitat alteration

Range management treatments

Breeding habitat. Until the early 1980s, herbicide treatment (primarily with 2,4-D) was the most common method to reduce sagebrush on large tracts of rangeland (Braun 1987). Klebenow (1970) reported cessation of nesting in newly sprayed areas with <5% live sagebrush canopy cover. Nesting also was nearly nonexistent in older sprayed areas containing about 5% live sagebrush cover (Klebenow 1970). In virtually all documented cases, herbicide application to blocks of sagebrush rangeland resulted in major declines in sage grouse breeding populations (Enyeart 1956, Higby 1969, Peterson 1970, Wallestad 1975). Effects of this treatment on sage grouse populations seemed more severe if the treated area was subsequently seeded to crested wheatgrass (*Agropyron cristatum*, Enyeart 1956).

Using fire to reduce sagebrush has become more common since most uses of 2,4-D on public lands were prohibited (Braun 1987). Klebenow (1972) and Sime (1991) suggested that fire may benefit sage grouse populations. Neither Gates (1983),

Table 2. Characteristics of sagebrush at sage grouse winter-use sites.

State	Canopy		Reference
	Coverage ^a (%)	Height ^a (cm)	
Colo.		24–36 ^{bd}	Beck 1977
Colo.		20–30 ^{cd}	Beck 1977
Colo.	43 ^b	34 ^b	Schoenberg 1982
Colo.	37 ^c	26 ^c	Schoenberg 1982
Colo.	30–38 ^{de}	41–54 ^{de}	Hupp 1987
Id.	38 ^e	56 ^e	Autenrieth 1981
Id.	26 ^b	29 ^b	Connelly 1982
Id.	25 ^c	26 ^c	Connelly 1982
Id.	15	46	Robertson 1991
Mont.	27	25	Eng and Schladweiler 1972
Mont.	>20		Wallestad 1975
Oreg.	12–17 ^d		Hanf et al. 1994

^a Mean canopy coverage or height of sagebrush above snow.

^b Males

^c Females

^d Ranges are given when data were provided for more than one year or area.

^e No snow present when measurements were made or total height of plant was measured.

Martin (1990), nor Bensen et al. (1991) reported adverse effects of fire on breeding populations of sage grouse. In contrast, following a 9-year study, Connelly et al. (1994, 2000b) indicated that prescribed burning of Wyoming big sagebrush during a drought period resulted in a large decline (>80%) of a sage grouse breeding population in southeastern Idaho. Additionally, Hulet (1983) documented loss of leks from fire and Nelle et al. (2000) reported that burning mountain big sagebrush stands had long-term negative impacts on sage grouse nesting and brood-rearing habitats. Canopy cover in mountain big sagebrush did not provide appropriate nesting habitat 14 years after burning (Nelle et al. 2000). The impact of fire on sage grouse populations using habitats dominated by silver sagebrush (which may sprout following fire) is unknown.

Cheatgrass (*Bromus tectorum*) will often occupy sites following disturbance, especially burning (Valentine 1989). Repeated burning or burning in late summer favors cheatgrass invasion and may be a major cause of the expansion of this species (Valentine 1989). The ultimate result may be a loss of the sage grouse population because of long-term conversion of sagebrush habitat to rangeland dominated by an annual exotic grass. However, this situation largely appears confined to the western portion of the species' range and does not commonly occur in Wyoming (J. Lawson, Wyoming Department of Game and Fish, personal communication).

Mechanical methods of sagebrush control have often been applied to smaller areas than those treated by herbicides or fire, especially to convert rangeland to cropland. However, adverse effects of this type of treatment on sage grouse breeding populations also have been documented. In Montana, Swenson et al. (1987) indicated that the number of breeding males declined by 73% after 16% of their study area was plowed.

Brood-rearing habitats. Martin (1970) reported that sage grouse seldom used areas treated with herbicides to remove sagebrush in southwestern Montana. In Colorado, Rogers (1964) indicated that an entire population of sage grouse appeared to emigrate from an area that was subjected to several years of herbicide application to remove sagebrush. Similarly, Klebenow (1970) reported that herbicide spraying reduced the brood-carrying capacity of an area in southeastern Idaho. However, application of herbicides in early spring to reduce sagebrush cover may enhance some

brood-rearing habitats by increasing the amount of herbaceous plants used for food (Autenrieth 1981).

Fire may improve sage grouse brood-rearing habitat (Klebenow 1972, Gates 1983, Sime 1991), but until recently, experimental evidence was not available to support or refute these contentions (Braun 1987). Pyle and Crawford (1996) suggested that fire may enhance brood-rearing habitat in montane settings but cautioned that its usefulness requires further investigation. A 9-year study of the effects of fire on sage grouse did not support that prescribed fire, conducted during late summer in a Wyoming big sagebrush habitat, improved brood-rearing habitat for sage grouse (Connelly et al. 1994, Fischer et al. 1996a). Prescribed burning of sage grouse habitat did not increase amount of forbs in burned areas compared to unburned areas (Fischer et al. 1996a, Nelle et al. 2000) and resulted in decreased insect populations in the treated area compared to the unburned area. Thus, fire may negatively affect sage grouse brood-rearing habitat rather than improve it in Wyoming big sagebrush habitats (Connelly and Braun 1997), but its effect on grouse habitats in mountain big sagebrush communities requires further investigation (Pyle and Crawford 1996, Nelle et al. 2000).

Sage grouse often use agricultural areas for brood-rearing habitat (Patterson 1952, Wallestad 1975, Gates 1983, Connelly et al. 1988, Blus et al. 1989). Grouse use of these areas may result in mortality because of exposure to insecticides. Blus et al. (1989) reported die-offs of sage grouse that were exposed to methamidiphos used in potato fields and dimethoate used in alfalfa fields. Dimethoate is used commonly for alfalfa, and 20 of 31 radio-marked grouse (65%) died following direct exposure to this insecticide (Blus et al. 1989).

Winter habitat. Reduction in sage grouse use of an area treated by herbicide was proportional to the severity (i.e., amount of damage to sagebrush) of the treatment (Pyrah 1972). In sage grouse winter range, strip partial kill, block partial kill, and total kill of sagebrush were increasingly detrimental to sage grouse in Montana (Pyrah 1972) and Wyoming (Higby 1969).

In Idaho, Robertson (1991) reported that a 2,000-ha prescribed burn that removed 57% of the sagebrush cover in sage grouse winter habitat minimally impacted the sage grouse population. Although sage grouse use of the burned area declined following the fire, grouse adapted to this disturbance by moving 1 to 10 km outside of the burn to areas

with greater sagebrush cover (Robertson 1991) than was available in the burned area.

Land use

Mining-energy development. Effects of mining, oil, and gas developments on sage grouse populations are not well known (Braun 1998). These activities negatively impact grouse habitat and populations over the short term (Braun 1998), but research suggests some recovery of populations following initial development and subsequent reclamation of the affected sites (Eng et al. 1979, Tate et al. 1979, Braun 1986). In Colorado, sage grouse were displaced by oil development and coal-mining activities, but numbers returned to pre-disturbance levels once the activities ceased (Braun 1987, Remington and Braun 1991). At least 6 leks in Alberta were disturbed by energy development and 4 were abandoned (Aldridge 1998). In Wyoming, female sage grouse captured on leks disturbed by natural gas development had lower nest-initiation rates, longer movements to nest sites, and different nesting habitats than hens captured on undisturbed leks (Lyon 2000). Sage grouse may repopulate an area following energy development but may not attain population levels that occurred prior to development (Braun 1998). Thus, short-term and long-term habitat loss appears to result from energy development and mining (Braun 1998).

Grazing. Domestic livestock have grazed over most areas used by sage grouse and this use is generally repetitive with annual or biennial grazing periods of varying timing and length (Braun 1998). Grazing patterns and use of habitats are often dependent on weather conditions (Valentine 1990). Historic and scientific evidence indicates that livestock grazing did not increase the distribution of sagebrush (Peterson 1995) but markedly reduced the herbaceous understory over relatively large areas and increased sagebrush density in some areas (Vale 1975, Tisdale and Hironaka 1981). Within the intermountain region, some vegetation changes from livestock grazing likely occurred because sagebrush steppe in this area did not evolve with intensive grazing by wild herbivores, as did the grassland prairies of central North America (Mack and Thompson 1982). Grazing by wild ungulates may reduce sagebrush cover (McArthur et al. 1988, Peterson 1995), and livestock grazing may result in high trampling mortality of sagebrush seedlings (Owens and Norton 1992). In Wyoming big sagebrush habitats, resting areas from livestock

grazing may improve understory production as well as decrease sagebrush cover (Wambolt and Payne 1986).

There is little direct experimental evidence linking grazing practices to sage grouse population levels (Braun 1987, Connelly and Braun 1997). However, grass height and cover affect sage grouse nest site selection and success (Wakkinen 1990, Gregg 1991, Gregg et al. 1994, DeLong et al. 1995, Sveum et al. 1998a). Thus, indirect evidence suggests grazing by livestock or wild herbivores that significantly reduces the herbaceous understory in breeding habitat may have negative impacts on sage grouse populations (Braun 1987, Dobkin 1995).

Miscellaneous activities. Construction of roads, powerlines, fences, reservoirs, ranches, farms, and housing developments has resulted in sage grouse habitat loss and fragmentation (Braun 1998). Between 1962 and 1997, >51,000 km of fence were constructed on land administered by the Bureau of Land Management in states supporting sage grouse populations (T. D. Rich, United States Bureau of Land Management, personal communication). Structures such as powerlines and fences pose hazards to sage grouse because they provide additional perch sites for raptors and because sage grouse may be injured or killed when they fly into these structures (Call and Maser 1985).

Weather

Prolonged drought during the 1930s and mid-1980s to early 1990s coincided with declining sage grouse populations throughout much of the species' range (Patterson 1952, Fischer 1994, Hanf et al. 1994). Drought may affect sage grouse populations by reducing herbaceous cover at nests and the quantity and quality of food available for hens and chicks during spring (Hanf et al. 1994, Fischer et al. 1996a).

Spring weather may influence sage grouse production. Relatively wet springs may result in increased production (Wallestad 1975, Autenrieth 1981). However, heavy rainfall during egg-laying or unseasonably cold temperatures with precipitation during hatching may decrease production (Wallestad 1975).

There is no evidence that severe winter weather affects sage grouse populations unless sagebrush cover has been greatly reduced or eliminated (Wallestad 1975, Beck 1977, Robertson 1991).

Predation

Over the last 25 years, numerous studies have used radiotelemetry to address sage grouse survival and nest success (Wallestad 1975; Hulet 1983; Gregg 1991; Robertson 1991; Connelly et al. 1993, 1994; Gregg et al. 1994; Schroeder 1997). Only Gregg (1991) and Gregg et al. (1994) indicated that predation was limiting sage grouse numbers, and their research suggested that low nest success from predation was related to poor nesting habitat. Most reported nest-success rates are >40%, suggesting that nest predation is not a widespread problem. Similarly, high survival rates of adult (Connelly et al. 1993, Zablan 1993) and older (>10 weeks of age) juvenile sage grouse indicate that population declines are not generally related to high levels of predation. Thus, except for an early study in Oregon (Batterson and Morse 1948), predation has not been identified as a major limiting factor for sage grouse (Connelly and Braun 1997).

Constructing ranches, farms, and housing developments has resulted in the addition of nonnative predators to sage grouse habitats, including dogs, cats, and red foxes (*Vulpes vulpes*; J. W. Connelly, Idaho Department of Fish and Game, unpublished data; B. L. Welch, United States Forest Service, personal communication) and may be responsible for increases in abundance of the common raven (*Corvus corax*, Sauer et al. 1997). Relatively high raven populations may decrease sage grouse nest success (Batterson and Morse 1948, Autenrieth 1981), but rigorous field studies using radiotelemetry do not support this hypothesis. Current work in Strawberry Valley, Utah, suggests that red foxes are taking a relatively high proportion of the population (Flinders 1999). This may become a greater problem if red foxes become well established throughout sage grouse breeding habitat.

Recommended guidelines

Sage grouse populations occupy relatively large areas on a year-round basis (Berry and Eng 1985, Connelly et al. 1988, Wakkinen 1990, Leonard et al. 2000), invariably involving a mix of ownership and jurisdictions. Thus, state and federal natural resource agencies and private landowners must coordinate efforts over at least an entire seasonal range to successfully implement these guidelines. Based on current knowledge of sage grouse population and habitat trends, these guidelines have been developed to help agencies and landowners

effectively assess and manage populations, protect and manage remaining habitats, and restore damaged habitat. Because of gaps in our knowledge and regional variation in habitat characteristics (Tisdale and Hironaka 1981), the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly. Further, we urge agencies to use an adaptive management approach (Macnab 1983, Gratson et al. 1993), using monitoring and evaluation to assess the success of implementing these guidelines to manage sage grouse populations.

Activities responsible for the loss or degradation of sagebrush habitats also may be used to restore these habitats. These activities include prescribed fire, grazing, herbicides, and mechanical treatments. Decisions on land treatments using these tools should be based on quantitative knowledge of vegetative conditions over an entire population's seasonal range. Generally, the treatment selected should be that which is least disruptive to the vegetation community and has the most rapid recovery time. This selection should not be based solely on economic cost.

Definitions

For the purpose of these guidelines, we define an occupied lek as a traditional display area in or adjacent to sagebrush-dominated habitats that has been attended by ≥ 2 male sage grouse in ≥ 2 of the previous 5 years. We define a breeding population as a group of birds associated with 1 or more occupied leks in the same geographic area separated from other leks by >20 km. This definition is somewhat arbitrary but generally based on maximum distances females move to nest.

Population management

1) Before making management decisions, agencies should cooperate to first identify lek locations and determine whether a population is migratory or nonmigratory. In the case of migratory populations, migration routes and seasonal habitats must be identified to allow for meaningful and correct management decisions.

2) Breeding populations should be assessed by either lek counts (census number of males attending leks) or lek surveys (classify known leks as active or inactive) each year (Autenrieth et al. 1982). Depending on number of counts each spring (Jenni and Hartzler 1978, Emmons and Braun

1984) and weather conditions when the counts were made, lek counts may not provide an accurate assessment of sage grouse populations (Beck and Braun 1980) and the data should be viewed with caution. Despite these shortcomings, lek counts provide the best index to breeding population levels and many long-term data sets are available for trend analysis (Connelly and Braun 1997).

3) Production or recruitment should be monitored by brood counts or wing surveys (Autenrieth et al. 1982). Brood counts are labor-intensive and usually result in inadequate sample size. Where adequate samples of wings can be obtained, we recommend using wing surveys to obtain estimates of sage grouse nesting success and juvenile:adult hen (including yearlings) ratios.

4) Routine population monitoring should be used to assess trends and identify problems for all hunted and nonhunted populations. Check stations, wing collections, and questionnaires can be used to obtain harvest information. Breeding population and production data (above) can be used to monitor nonhunted populations.

5) The genetic variation of relatively small, isolated populations should be documented to better understand threats to these populations and implement appropriate management actions (Young 1994, Oyler-McCance et al. 1999).

6) Hunting seasons for sage grouse should be based on careful assessments of population size and trends. Harvest should not be based on the observations of Allen (1954:43), who stated, "Our populations of small animals operate under a 1-year plan of decimation and replacement; and Nature habitually maintains a wide margin of overproduction. She kills off a huge surplus of animals whether we take our harvest or not." To the contrary, sage grouse tend to have relatively long lives with low annual turnover (Zablan 1993, Connelly et al. 1994) and a low reproductive rate (Gregg 1991, Connelly et al. 1993). Consequently, hunting may be additive to other causes of mortality for sage grouse (Johnson and Braun 1999, Connelly et al. 2000a). However, most populations appear able to sustain hunting if managed carefully (Connelly et al. 2000a).

7) If populations occur over relatively large geographic areas and are stable to increasing, seasons and bag limits can be relatively liberal (2- to 4-bird daily bag limit and a 2- to 5-week season) for hunting seasons allowing firearms (Braun and Beck 1985).

8) If populations are declining (for 3 or more consecutive years) or trends are unknown, seasons and bag limits should be generally conservative (1- or 2-bird daily bag limit and a 1- to 4-week season) for hunting seasons allowing firearms, or suspended (for all types of hunting, including falconry and Native American subsistence hunting) because of this species' population characteristics (Braun 1998, Connelly et al. 2000a).

9) Where populations are hunted, harvest rates should be 10% or less of the estimated fall population to minimize negative effects on the subsequent year's breeding population (Connelly et al. 2000a).

10) Populations should not be hunted where ≤ 300 birds comprise the breeding population (i.e., ≤ 100 males are counted on leks [C. E. Braun, Colorado Division of Wildlife, unpublished report]).

11) Spring hunting of sage grouse on leks should be discouraged or, if unavoidable, confined to males only during the early portion of the breeding season. Spring hunting is considered an important tradition for some Native American tribes. However, in Idaho, 80% of the leks hunted during spring in the early 1990s ($n=5$) had become inactive by 1994 (Connelly et al. 1994).

12) Viewing sage grouse on leks (and censusing leks) should be conducted so that disturbance to birds is minimized or preferably eliminated (Call and Maser 1986). Agencies should generally not provide all lek locations to individuals simply interested in viewing birds. Instead, 1 to 3 lek locations should be identified as public viewing leks, and if demand is great enough, agencies should consider erecting 2-3 seasonal blinds at these leks for public use. Camping in the center of or on active leks should be vigorously discouraged.

13) Discourage establishment of red fox and other nonnative predator populations in sage grouse habitats.

14) For small, isolated populations and declining populations, assess the impact of predation on survival and production. Predator control programs are expensive and often ineffective. In some cases, these programs may provide temporary help while habitat is recovering. Predator management programs also could be considered in areas where seasonal habitats are in good condition but their extent has been reduced greatly. However, predator management should be implemented only if the available data (e.g., nest success $< 25\%$, annual survival of adult hens $< 45\%$) support the action.

General habitat management

The following guidelines pertain to all seasonal habitats used by sage grouse:

1) Monitor habitat conditions and propose treatments only if warranted by range condition (i.e., the area no longer supports habitat conditions described in the following guidelines under habitat protection). Do not base land treatments on schedules, targets, or quotas.

2) Use appropriate vegetation treatment techniques (e.g., mechanical methods, fire) to remove junipers and other conifers that have invaded sage grouse habitat (Commons et al. 1999). Whenever possible, use vegetation control techniques that are least disruptive to the stand of sagebrush, if this stand meets the needs of sage grouse (Table 3).

3) Increase the visibility of fences and other structures occurring within 1 km of seasonal ranges by flagging or similar means if these structures appear hazardous to flying grouse (e.g., birds have been observed hitting or narrowly missing these structures or grouse remains have been found next to these structures).

4) Avoid building powerlines and other tall structures that provide perch sites for raptors within 3 km of seasonal habitats. If these structures must be built, or presently exist, the lines should be buried or poles modified to prevent their use as raptor perch sites.

Breeding habitat management

For migratory and nonmigratory populations, lek attendance, nesting, and early brood rearing occur in breeding habitats. These habitats are sagebrush-dominated rangelands with a healthy herbaceous understory and are critical for survival of sage grouse populations. Mechanical disturbance, prescribed fire, and herbicides can be used to restore sage grouse habitats to those conditions identified as appropriate in the following sections on habitat protection. Local biologists and range ecologists should select the appropriate technique on a case-

Table 3. Characteristics of sagebrush rangeland needed for productive sage grouse habitat.

	Breeding		Brood-rearing		Winter ^e	
	Height(cm)	Canopy (%)	Height(cm)	Canopy (%)	Height(cm)	Canopy (%)
Mesic sites ^a						
Sagebrush	40–80	15–25	40–80	10–25	25–35	10–30
Grass-forb	>18 ^c	≥25 ^d	variable	>15	N/A	N/A
Arid sites ^a						
Sagebrush	30–80	15–25	40–80	10–25	25–35	10–30
Grass/forb	>18 ^c	≥15	variable	>15	N/A	N/A
Area ^b		>80		>40		>80

^a Mesic and arid sites should be defined on a local basis; annual precipitation, herbaceous understory, and soils should be considered (Tisdale and Hironaka 1981, Hironaka et al. 1983).

^b Percentage of seasonal habitat needed with indicated conditions.

^c Measured as “droop height”; the highest naturally growing portion of the plant.

^d Coverage should exceed 15% for perennial grasses and 10% for forbs; values should be substantially greater if most sagebrush has a growth form that provides little lateral cover (Schroeder 1995)

^e Values for height and canopy coverage are for shrubs exposed above snow.¹

by-case basis. Generally, fire should not be used in breeding habitats dominated by Wyoming big sagebrush if these areas support sage grouse. Fire can be difficult to control and tends to burn the best remaining nesting and early brood-rearing habitats (i.e., those areas with the best remaining understory), while leaving areas with poor understory. Further, we recommend against using fire in habitats dominated by xeric mountain big sagebrush (*A. t. xericensis*) because annual grasses commonly invade these habitats and much of the original habitat has been altered by fire (Bunting et al. 1987).

Although mining and energy development are common activities throughout the range of sage grouse, quantitative data on the long-term effects of these activities on sage grouse are limited. However, some negative impacts have been documented (Braun 1998, Lyon 2000). Thus, these activities should be discouraged in breeding habitats, but when they are unavoidable, restoration efforts should follow procedures outlined in these guidelines.

Habitat protection

1) Manage breeding habitats to support 15–25% canopy cover of sagebrush, perennial herbaceous cover averaging ≥18 cm in height with ≥15% canopy cover for grasses and ≥10% for forbs and a diversity of forbs (Barnett and Crawford 1994, Drut et al. 1994a, Apa 1998) during spring (Table 3). Habitats meeting these conditions should have a high priority for wildfire suppression and should

not be considered for sagebrush control programs. Sagebrush and herbaceous cover should provide overhead and lateral concealment from predators. If average sagebrush height is >75 cm, herbaceous cover may need to be substantially greater than 18 cm to provide this protection. There is much variability among sagebrush-dominated habitats (Tisdale and Hironaka 1981, Hironaka et al. 1983), and some Wyoming sagebrush and low sagebrush breeding habitats may not support 25% herbaceous cover. In these areas, total herbaceous cover should be $\geq 15\%$ (Table 3). Further, the herbaceous height requirement may not be possible in habitats dominated by grasses that are relatively short when mature. In all of these cases, local biologists and range ecologists should develop height and cover requirements that are reasonable and ecologically defensible. Leks tend to be relatively open, thus cover on leks should not meet these requirements.

2) For nonmigratory grouse occupying habitats that are distributed uniformly (i.e., habitats have the characteristics described in guideline 1 and are generally distributed around the leks), protect (i.e., do not manipulate) sagebrush and herbaceous understory within 3.2 km of all occupied leks. For nonmigratory populations, consider leks the center of year-round activity and use them as focal points for management efforts (Braun et al. 1977).

3) For nonmigratory populations where sagebrush is not distributed uniformly (i.e., habitats have the characteristics described in guideline 1 but distributed irregularly with respect to leks), protect suitable habitats for ≤ 5 km from all occupied leks. Use radiotelemetry, repeated surveys for grouse use, or habitat mapping to identify nesting and early brood-rearing habitats.

4) For migratory populations, identify and protect breeding habitats within 18 km of leks in a manner similar to that described for nonmigratory sage grouse. For migratory sage grouse, leks generally are associated with nesting habitats but migratory birds may move >18 km from leks to nest sites. Thus, protection of habitat within 3.2 km of leks may not protect most of the important nesting areas (Wakkinen et al. 1992, Lyon 2000).

5) In areas of large-scale habitat loss ($\geq 40\%$ of original breeding habitat), protect all remaining habitats from additional loss or degradation. If remaining habitats are degraded, follow guidelines for habitat restoration listed below.

6) During drought periods (≥ 2 consecutive years), reduce stocking rates or change manage-



Sage grouse just leaving a nest in good-condition breeding habitat in southwestern Idaho. Note the height of grass and herbaceous cover.

ment practices for livestock, wild horses, and wild ungulates if cover requirements during the nesting and brood-rearing periods are not met. Grazing pressure from domestic livestock and wild ungulates should be managed in a manner that at all times addresses the possibility of drought.

7) Suppress wildfires in all breeding habitats. In the event of multiple fires, land management agencies should have all breeding habitats identified and prioritized for suppression, giving the greatest priority to those that have become fragmented or reduced by $>40\%$ in the last 30 years.

8) Adjust timing of energy exploration, development, and construction activity to minimize disturbance of sage grouse breeding activities. Energy-related facilities should be located >3.2 km from active leks whenever possible. Human activities within view of or <0.5 km from leks should be minimized during the early morning and late evening when birds are near or on leks.

Habitat restoration

1) Before initiating vegetation treatments, quantitatively evaluate the area proposed for treatment to ensure that it does not have sagebrush and herbaceous cover suitable for breeding habitat (Table 3). Treatments should not be undertaken within sage grouse habitats until the limiting vegetation factor(s) has been identified, the proposed treatment is known to provide the desired vegetation response, and land-use activities can be managed after treatment to ensure that vegetation objectives are met.

2) Restore degraded rangelands to a condition that again provides suitable breeding habitat for sage grouse by including sagebrush, native forbs

(especially legumes), and native grasses in reseed- ing efforts (Apa 1998). If native forbs and grasses are unavailable, use species that are functional equivalents and provide habitat characteristics similar to those of native species.

3) Where the sagebrush overstory is intact but the understory has been degraded severely and quality of nesting habitat has declined (Table 3), use appropriate techniques (e.g., brush beating in strips or patches and interseed with native grasses and forbs) that retain some sagebrush but open shrub canopy to encourage forb and grass growth.

4) Do not use fire in sage grouse habitats prone to invasion by cheatgrass and other invasive weed species unless adequate measures are included in restoration plans to replace the cheatgrass under- story with perennial species using approved reseeding strategies. These strategies could include, but are not limited to, use of pre-emergent herbicides (e.g., Oust®, Plateau®) to retard cheat- grass germination until perennial herbaceous species become established.

5) When restoring habitats dominated by Wyoming big sagebrush, regardless of the tech- niques used (e.g., prescribed fire, herbicides), do not treat >20% of the breeding habitat (including areas burned by wildfire) within a 30-year period (Bunting et al. 1987). The 30-year period represents the approximate recovery time for a stand of Wyoming big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat (Table 3). In some cases, this may take <30 years and in other cases >30 years. If 2,4-D or similar herbicides are used, they should be applied in strips such that their effect on forbs is minimized. Because fire generally burns the best remaining sage grouse habitats



This breeding habitat is in poor condition because of a lack of understory.

(i.e., those with the best understory) and leaves areas with sparse understory, use fire for habitat restoration only when it can be convincingly demonstrated to be in the best interest of sage grouse.

6) When restoring habitats dominated by moun- tain big sagebrush, regardless of the techniques used (e.g., fire, herbicides), treat $\leq 20\%$ of the breed- ing habitat (including areas burned by wildfire) within a 20-year period (Bunting et al. 1987). The 20-year period represents the approximate recov- ery time for a stand of mountain big sagebrush. Additional treatments should be deferred until the previously treated area again provides suitable breeding habitat (Table 3). In some cases, this may take <20 years and in other cases >20 years. If 2,4- D or similar herbicides are used, they should be applied in strips such that their effect on forbs is minimized.

7) All wildfires and prescribed burns should be evaluated as soon as possible to determine whether reseeding is necessary to achieve habitat manage- ment objectives. If needed, reseed with sagebrush, native bunchgrasses, and forbs whenever possible.

8) Until research unequivocally demonstrates that using tebuthiuron and similar-acting herbicides to control sagebrush has no long-lasting negative impacts on sage grouse habitat, use these herbi- cides only on an experimental basis and over a suf- ficiently small area that any long-term negative impacts are negligible. Because these herbicides have the potential of reducing but not eliminat- ing sagebrush cover within grouse breeding habitats, thus stimulating herbaceous development, their use as sage grouse habitat management tools should be examined closely.



Nest habitat is measured in Owyhee County, southwestern Idaho.



John Crawford explains Oregon's sage grouse research program to field-trip attendees during a meeting of the Western States Sage and Columbian sharp-tailed Grouse Technical Committee.

Summer-late brood-rearing habitat management

Sage grouse may use a variety of habitats, including meadows, farmland, dry lakebeds, sagebrush, and riparian zones from late June to early November (Patterson 1952, Wallestad 1975, Connelly 1982, Hanf et al. 1994). Generally, these habitats are characterized by relatively moist conditions and many succulent forbs in or adjacent to sagebrush cover.

Habitat protection

1) Avoid land-use practices that reduce soil moisture effectiveness, increase erosion, cause invasion of exotic plants, and reduce abundance and diversity of forbs.

2) Avoid removing sagebrush within 300 m of sage grouse foraging areas along riparian zones, meadows, lakebeds, and farmland, unless such removal is necessary to achieve habitat management objectives (e.g., meadow restoration, treatment of conifer encroachment).

3) Discourage use of very toxic organophosphorus and carbamate insecticides in sage grouse brood-rearing habitats. Sage grouse using agricultural areas may be adversely affected by pesticide applications (Blus et al. 1989). Less toxic agricultural chemicals or biological control may provide suitable alternatives in these areas.

4) Avoid developing springs for livestock water, but if water from a spring will be used in a pipeline or trough, design the project to maintain free water and wet meadows at the spring. Capturing water from springs using pipelines and troughs may adversely affect wet meadows used by grouse for foraging.

Habitat restoration

1) Use brush beating or other mechanical treatments in strips 4-8 m wide in areas with relatively high shrub-canopy cover ($\geq 35\%$ total shrub cover) to improve late brood-rearing habitats. Brush beating can be used to effectively create different age classes of sagebrush in large areas with little age diversity.

2) If brush beating is impractical, use fire or herbicides to create a mosaic of openings in mountain big sagebrush and mixed-shrub communities used as late brood-rearing habitats where total shrub cover is $\geq 35\%$. Generally, 10-20% canopy cover of sagebrush and $\leq 25\%$ total shrub cover will provide adequate habitat for sage grouse during summer.

3) Construct water developments for sage grouse only in or adjacent to known summer-use areas and provide escape ramps suitable for all avian species and other small animals. Water developments and "guzzlers" may improve sage grouse summer habitats (Autenrieth et al. 1982, Hanf et al. 1994). However, sage grouse used these developments infrequently in southeastern Idaho because most were constructed in sage grouse winter and breeding habitat rather than summer range (Connelly and Doughty 1989).

4) Whenever possible, modify developed springs and other water sources to restore natural free-flowing water and wet meadow habitats.

Winter habitat management

Sagebrush is the essential component of winter habitat. Sage grouse select winter-use sites based on snow depth and topography, and snowfall can affect the amount and height of sagebrush available to grouse (Connelly 1982, Hupp and Braun 1989, Robertson 1991). Thus, on a landscape scale, sage grouse winter habitats should allow grouse access to sagebrush under all snow conditions (Table 3).

Habitat protection

1) Maintain sagebrush communities on a landscape scale, allowing sage grouse access to sagebrush stands with canopy cover of 10-30% and heights of at least 25-35 cm regardless of snow cover. These areas should be high priority for wild-fire suppression and sagebrush control should be avoided.

2) Protect patches of sagebrush within burned areas from disturbance and manipulation. These areas may provide the only winter habitat for sage grouse and their loss could result in the extirpation of the grouse population. They also are important

seed sources for sagebrush re-establishment in the burned areas. During fire-suppression activities do not remove or burn any remaining patches of sagebrush within the fire perimeter.

3) In areas of large-scale habitat loss ($\geq 40\%$ of original winter habitat), protect all remaining sagebrush habitats.

Habitat restoration

1) Reseed former winter range with the appropriate subspecies of sagebrush and herbaceous species unless the species are recolonizing the area in a density that would allow recovery (Table 3) within 15 years.

2) Discourage prescribed burns >50 ha, and do not burn $>20\%$ of an area used by sage grouse during winter within any 20–30-year interval (depending on estimated recovery time for the sagebrush habitat).

Conservation strategies

We recommend that each state and province develop and implement conservation plans for sage grouse. These plans should use local working groups comprised of representatives of all interested agencies, organizations, and individuals to identify and solve regional issues (Anonymous 1997). Within the context of these plans, natural resource agencies should cooperate to document the amount and condition of sagebrush rangeland remaining in the state or province. Local and regional plans should summarize common problems to conserve sage grouse and general conditions (Table 3) needed to maintain healthy sage grouse populations. Local differences in conditions that affect sage grouse populations may occur and should be considered in conservation plans. Natural resource agencies should identify remaining breeding and winter ranges in Wyoming big sagebrush habitats and establish these areas as high priority for wildfire suppression. Prescribed burning in habitats that are in good ecological condition should be avoided. Protection and restoration of sage grouse habitats also will likely benefit many other sagebrush obligate species (Saab and Rich 1997) and enhance efforts to conserve and restore sagebrush steppe.

Although translocating sage grouse to historical range has been done on numerous occasions, few attempts have been successful (Musil et al. 1993, Reese and Connelly 1997). Thus, we agree with Reese and Connelly (1997) that translocation

efforts should be viewed as only experimental at this time and not as a viable management strategy.

More information is needed on characteristics of healthy sagebrush ecosystems and the relationship of grazing to sage grouse production. Field experiments should be implemented to evaluate the relationship of grazing pressure (i.e., disturbance and removal of herbaceous cover) to sage grouse nest success and juvenile survival (Connelly and Braun 1997). The overall quality of existing sage grouse habitat will become increasingly important as quantity of these habitats decrease. Sage grouse populations appear relatively secure in some portions of their range and at risk in other portions. However, populations that have thus far survived extensive habitat loss may still face extinction because of a time lag between habitat loss and ultimate population collapse (Cowlshaw 1999).

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RESEARCH ARTICLE

Postwildfire seeding to restore native vegetation and limit exotic annuals: an evaluation in juniper-dominated sagebrush steppe

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Reestablishment of perennial vegetation is often needed after wildfires to limit exotic species and restore ecosystem services. However, there is a growing body of evidence that questions if seeding after wildfires increases perennial vegetation and reduces exotic plants. The concern that seeding may not meet restoration goals is even more prevalent when native perennial vegetation is seeded after fire. We evaluated vegetation cover and density responses to broadcast seeding native perennial grasses and mountain big sagebrush (*Artemisia tridentata* Nutt. spp. *vaseyana* [Rydb.] Beetle) after wildfires in the western United States in six juniper (*Juniperus occidentalis* ssp. *occidentalis* Hook)-dominated mountain big sagebrush communities for 3 years postfire. Seeding native perennial species compared to not seeding increased perennial grass and sagebrush cover and density. Perennial grass cover was 4.3 times greater in seeded compared to nonseeded areas. Sagebrush cover averaged 24 and less than 0.1% in seeded and nonseeded areas at the conclusion of the study, respectively. Seeding perennial species reduced exotic annual grass and annual forb cover and density. Exotic annual grass cover was 8.6 times greater in nonseeded compared to seeded areas 3 years postfire. Exotic annual grass cover increased over time in nonseeded areas but decreased in seeded areas by the third-year postfire. Seeded areas were perennial-dominated and nonseeded areas were annual-dominated at the end of the study. Establishing perennial vegetation may be critical after wildfires in juniper-dominated sagebrush steppe to prevent the development of annual-dominated communities. Postwildfire seeding increased perennial vegetation and reduced exotic plants and justifies its use.

Key words: annual grasses, broadcast, cheatgrass, seeding, shrubs, western juniper

Implications for Practice

- Postfire seeding can increase native vegetation and limit exotic plants.
- After wildfire in juniper-dominated sagebrush steppe, perennial vegetation should be seeded to restore ecosystem services and limit exotic annual grasses.
- Broadcast seeding native perennial grasses and sagebrush is a viable restoration method after fire in juniper-dominated sagebrush communities.
- Research is needed to increase restoration efficiency by determining optimal broadcast seeding rates and seeding mixtures.
- Preventing conifer-dominance of sagebrush communities should be a management priority to limit the need for postfire restoration.

Introduction

Postfire restoration of native vegetation is often needed in imperiled ecosystems. Restoring native vegetation is critical because some native fauna require specific habitat components that only native vegetation can provide. As areas burned annually increase in some regions (Krawchuk et al. 2009; Adams 2013), restoration of native vegetation will only become a more pressing issue.

This need will likely increase in many areas because larger and more frequent and severe wildfires are expected with climate change and increasing CO₂ levels (Fried et al. 2004; Fulé 2008; Yue et al. 2013).

Seeding after wildfires is a commonly used management tool applied with the goal of increasing vegetation cover and reducing the abundance of exotic species (Robichaud et al. 2000; Beyer 2004). Seeding vegetation after fire is assumed to increase seeded species that will utilize resources that would otherwise be available to exotic species. However, seeding after fire has generally not achieved the goal of increasing native vegetation cover and reducing exotic species (Peppin et al. 2010; Stella et al. 2010). Furthermore, seeding native species after wildfires has been limited and there is little published information on the effectiveness of postfire seeding of native species (Beschta et al. 2004). One notable exception is Thompson et al. (2006)

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who reported seeding native and non-native species in sagebrush (*Artemisia L.*) steppe communities in Utah, United States, increased perennial vegetation and limited exotic plants.

The sagebrush steppe is an ecosystem that is imperiled from multiple threats (Knick et al. 2003; Davies et al. 2011) and, consequently, multiple sagebrush-associated species are of conservation concern (Crawford et al. 2004; Suring et al. 2005; Shipley et al. 2006). The sagebrush steppe developed with infrequent fire (Wright & Bailey 1982; Mensing et al. 2006); however, exotic annual grasses have altered its recovery after fire (Davies et al. 2009). Periodic fire is necessary for limiting conifer encroachment in higher elevation sagebrush communities (Miller & Tausch 2001; Miller et al. 2005). However, once a conifer woodland has developed, the potential for a more severe fire is elevated because of increased fuel loads (Tausch 1999; Miller et al. 2008; Stebleton & Bunting 2009). Higher severity fire in fully developed woodlands increases the probability of a substantial exotic annual grass invasion (Bates et al. 2014). Limiting exotic annual grasses is important because they compete with native vegetation (Melgoza et al. 1990; Humphrey & Schupp 2004) and promote frequent wildfires that are detrimental to native species (D'Antonio & Vitousek 1992). Increases in exotic annual grass abundance are also correlated with exponential declines in native plant species and biodiversity (Davies 2011).

Reestablishing native perennial-dominated plant communities after wildfire in western juniper (*Juniperus occidentalis* ssp. *occidentalis* Hook)-encroached mountain big sagebrush (*Artemisia tridentata* Nutt. ssp. *vaseyana* [Rydb.] Beetle) is important because postfire exotic plant invasion can be substantial in some locations (e.g. Bates et al. 2014; Davies & Bates 2017). Furthermore, restoring native vegetation in mountain big sagebrush communities is important because these are some of the most productive sagebrush communities (Hironaka et al. 1983; Davies & Bates 2010a, 2010b). This is an issue on millions of hectares of mountain big sagebrush that have been or are at risk of juniper encroachment in the northern Great Basin and Columbia Plateau (Miller et al. 2000; Miller et al. 2005).

Information on postwildfire seeding of native vegetation in juniper-dominated sagebrush communities is lacking. What information is available focuses on seeding after prescribed fire (Sheley & Bates 2008; Davies et al. 2014, 2017; Davies & Bates 2017). These studies were also limited as they only seeded sagebrush (Davies et al. 2017; Davies & Bates 2017), included non-native species (Davies et al. 2014), or used small plot design (2 × 2 m) that did not include sagebrush (Sheley & Bates 2008). Seeding mountain big sagebrush is often successful (Davies et al. 2014, 2018; Davies & Bates 2017). Herbaceous vegetation, particularly non-native species, may limit shrub establishment (Rinella et al. 2015, 2016; Davies et al. 2017). The effects, however, of seeding sagebrush in combination with native herbaceous vegetation are unknown. Exotic annual species can be limited when native perennial species become established in high numbers in Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *wyomingensis* Beetle & Young) communities (Davies & Johnson 2017), but this has not been tested in mountain big sagebrush communities. Evaluating the

ability of seeded native species to establish after wildfire in juniper-dominated mountain big sagebrush is critically needed to assist land managers developing postfire restoration plans, especially in plant communities at risk of exotic annual grass invasion after wildfire.

There is a prevailing assumption that mountain big sagebrush communities recover after fire without the need for active restoration efforts (e.g. seeding). This view likely developed because mountain big sagebrush plant communities are considered more resilient to wildfire and resistant to exotic annual grass invasion than lower elevation sagebrush communities (Davies et al. 2011; Chambers et al. 2014). Mountain big sagebrush also historically burned more frequently than less productive sagebrush communities (Miller et al. 2005) and intact (i.e. nonconifer encroached) mountain big sagebrush communities often recover after fire without seeding (Lesica et al. 2007; Nelson et al. 2014). Another common assumption is that if burned mountain big sagebrush communities need seeding, introduced species should be used to rapidly occupy the site and prevent exotic plant invasion. This likely evolved from experiences in hotter, drier Wyoming big sagebrush communities where seeding introduced species is much more successful at increasing perennial vegetation and limiting exotic annual species than seeding native species (Eiswerth et al. 2009; Boyd & Davies 2010; Davies et al. 2015). Therefore, it is important to determine if seeding is needed and if seeding native vegetation can increase perennial vegetation and limit exotic annual species after wildfire in juniper-dominated mountain big sagebrush communities.

The purpose of this study was to evaluate the effects of seeding native perennial vegetation after wildfire in western juniper-dominated mountain big sagebrush communities that may be at risk of postfire exotic annual grass invasion and dominance. We hypothesized that seeding native perennial grasses and sagebrush after wildfire in juniper-dominated mountain big sagebrush communities would increase sagebrush and perennial grass cover and density and limit exotic annual grass and annual forb cover and density compared to unseeded areas.

Methods

Study Area

The study was conducted in southeastern Oregon in areas burned in the Buzzard wildfire complex and the Glass Butte wildfire in 2014. Study sites were located between 52 km west and 90 km southeast of Burns, Oregon. At the time of the wildfires, study sites were fully developed western juniper woodlands (i.e. dominated by juniper) established on mountain big sagebrush-bunchgrass plant communities. Juniper cover ranged from 23 to 42% across the sites prior to burning. Sagebrush was largely displaced from the communities by juniper encroachment prior to the wildfires. Wildfires killed 100% of the junipers at the study sites. Historical fire return intervals for these communities would have been less than 50 years and may have been as common as every decade (Miller et al. 2005). Common perennial grasses postfire included bluebunch wheatgrass (*Pseudoroegneria spicata* [Pursh] A. Löve), Thurber's

needlegrass (*Achnatherum thurberianum* [Piper] Barkworth), Idaho fescue (*Festuca idahoensis* Elmer), bottlebrush squirreltail (*Elymus elymoides* [Raf.] Swezey), and Sandberg bluegrass (*Poa secunda* J. Presl). Study sites ranged in elevation from 1,499 to 1,683 m above sea level. Slopes ranged from 0 to 45° with aspects facing north, south, east, and west. Soils ranged from silty clay to loamy among study sites. Regional climate consists of cool, wet winters and hot, dry summers. Long-term annual precipitation (1981–2010) ranged from 300 to 426 mm among the study sites (PRISM 2018). Crop year (1 October–30 September) precipitation averaged 91, 87, and 101% of the long-term average in 2014–2015, 2015–2016, and 2016–2017, respectively. Livestock were excluded for the duration of study. Wildlife was not excluded but we saw little evidence of wildlife use.

Experimental Design and Measurements

We used a randomized complete block design with six blocks (sites) to evaluate the effects of seeding native perennial vegetation after wildfire in juniper-dominated mountain big sagebrush communities. Blocks were separated by up to 133 km. Treatments were: (1) broadcast seeded with sagebrush and native perennial grasses (seeded), and (2) not seeded (control). Treatments were randomly assigned to one of two 10 × 30 m plots at each block. Seeding treatments were applied on 18 and 19 November of 2014. The native seed mix contained mountain brome (*Bromus marginatus* Nees ex Steud.), thickspike wheatgrass (*Elymus lanceolatus* [Scribn. & J.G. Sm.] Gould), Sherman big bluegrass (*Poa secunda* J. Presl), prairie Junegrass (*Koeleria macrantha* [Ledeb.] Schult.), Idaho fescue, Snake River wheatgrass (*Elymus wawawaiensis* J. Carlson & Barkworth), bottlebrush squirreltail, bluebunch wheatgrass, Sandberg bluegrass, and mountain big sagebrush. We originally intended to seed each species at 1.45 kg/ha but a technical error in the application resulted in each species being seeded at 5.8 kg/ha.

Vegetation measurements were conducted in early July of 2015, 2016, and 2017 using four, parallel 30-m transects spaced 2 m apart in each treatment plot in each block. Herbaceous foliar cover by species was estimated in 0.2 m⁻² quadrats located every 3 m along each 30-m transect (starting at 3 m and ending at 27 m). Bare ground, litter, biological soil crust, and rock cover were also estimated in the 0.2 m⁻² quadrats. Herbaceous density by species was measured by counting all plants rooted in the 0.2 m⁻² quadrats. Rhizomatous species density was estimated by dividing quadrats into quarters and counting quarters that contained the species. Shrub cover by species was measured using the line-intercept method along each 30-m transect. Shrub density by species was measured by counting shrubs rooted inside a 2 × 30-m belt transect placed over each 30-m transect. Sagebrush density was also recorded as juvenile or mature. Sagebrush was considered mature if it had reproductive stems.

Statistical Analyses

Repeated measures analysis of variance (ANOVA) using the mixed models procedure (Proc Mixed) in SAS v. 9.4 (SAS

Institute Inc., Cary, NC, U.S.A.) was used to compare between treatments and years. Block and block by treatment interactions were considered random effects and year of sampling was the repeated variable. Covariance structure was determined using Akaike's information criterion (Littell et al. 1996). Data that violated ANOVA assumptions were square root transformed prior to analyses to better meet the assumptions of ANOVAs. All data presented are in their original dimensions (i.e. nontransformed). For analyses, herbaceous cover and density were separated into five groups: Sandberg bluegrass, perennial grasses, exotic annual grasses, perennial forbs, and annual forbs. Sandberg bluegrass was treated as its own plant group because it is smaller in stature, develops phenologically earlier, and responds differently to disturbances than other perennial grasses of the sagebrush steppe. Sherman big bluegrass, though currently classified as a variety of Sandberg bluegrass, was grouped with the other perennial grasses in the analyses because it is larger and matures later than the more common Sandberg bluegrass in this ecosystem. The exotic annual grass group was predominately comprised of cheatgrass (*Bromus tectorum* L.) with some medusahead (*Taeniatherum caput-medusae* [L.] Nevski). Shrubs were separated into sagebrush and other shrubs for analyses. Significance level for all tests was set at $p \leq 0.05$ and response variable means were reported with standard errors.

Results

Perennial grass cover differed between treatments and among years ($p = 0.026$ and 0.012 , respectively; Fig. 1A). Perennial grass cover was 4.3 times greater in the seeded treatment compared to the controls 3 years postfire. Sandberg bluegrass cover did not differ between treatments ($p = 0.069$; Fig. 1B) but varied by year ($p < 0.001$) and generally declined over time. Perennial forb cover did not vary between treatments ($p = 0.848$) or among years ($p = 0.815$) and averaged $1.3 \pm 0.5\%$ and $1.5 \pm 0.5\%$ in the seeded treatment and controls at the end of the study, respectively. Exotic annual grass cover varied by the interaction between treatment and year ($p = 0.001$; Fig. 1C). In the controls, exotic annual grass cover increased over time but in the seeded treatment, annual grass cover peaked the second postfire year and then declined the third-year postfire. Nonseeded controls had 8.6 times greater exotic annual grass cover compared to the seeded treatment at the end of the study. Annual forb cover varied between treatments and among years ($p = 0.003$ and < 0.001 , respectively; Fig. 1D). Annual forb cover was 2.4 times greater in the controls compared to the seeded treatment 3 years postfire. Bare ground and rock cover did not differ between treatments ($p = 0.642$ and 0.274 , respectively) but both varied among years ($p < 0.001$; Fig. 2A & 2B). Bare ground and rock generally declined over time in both treatments. Litter was similar between treatments ($p = 0.141$) but varied among years ($p < 0.001$; Fig. 2C). Litter increased over time in both treatments. Biological soil crust cover was similar between treatments and among years ($p = 0.810$ and 0.086 , respectively). At the end of the study, biological soil crust cover was 0.005 ± 0.005 and $0.006 \pm 0.004\%$ in the seeded treatment and controls, respectively. Sagebrush cover varied by the

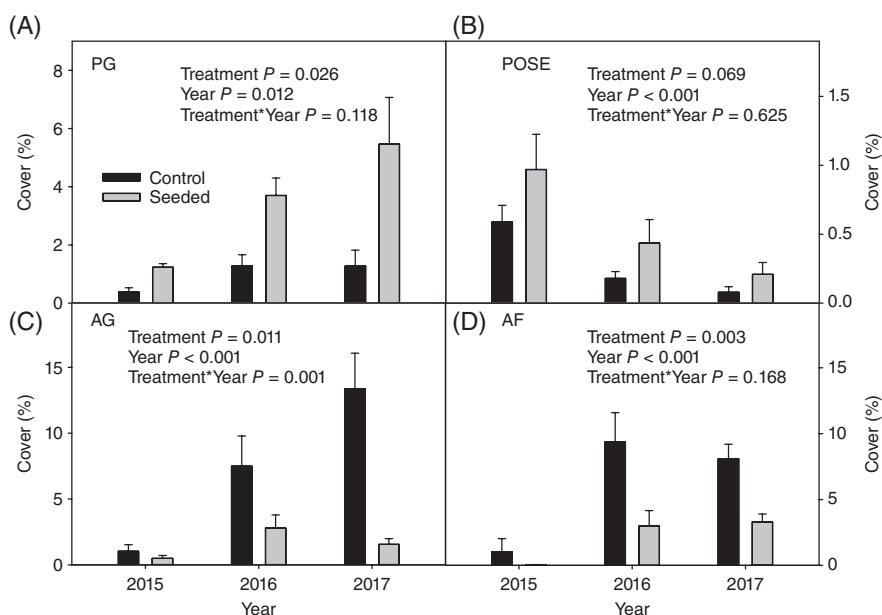


Figure 1. Herbaceous functional group cover (mean + SE) in the seeded and control treatments in 2015, 2016, and 2017. PG, perennial grass (A), POSE, Sandberg bluegrass (B), AG, exotic annual grass (C), and AF, annual forb (D).

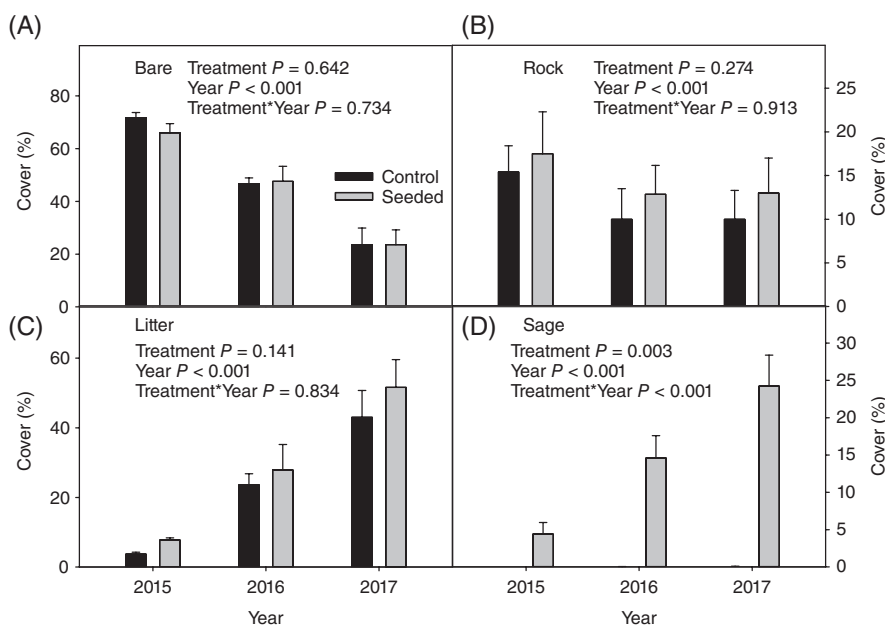


Figure 2. Cover groups cover (mean + SE) in the seeded and control treatments in 2015, 2016, and 2017. Bare, bare ground (A); rock, rock (B); litter, ground litter (C); and sage, sagebrush (D).

interaction between treatment and year ($p < 0.001$; Fig. 2D). Sagebrush cover increased over time in the seeded treatment but remained low and constant in the control treatment. By the end of the study, sagebrush cover average $24 \pm 4\%$ and $0.06 \pm 0.06\%$ in the seeded treatment and controls, respectively. Other shrub cover was similar between treatments and among years ($p = 0.206$ and 0.101 , respectively). Other shrub cover was

$1.7 \pm 1.6\%$ and $1.7 \pm 1.2\%$ in the seeded treatment and controls at the conclusion of the study, respectively.

Perennial grass density was greater in the seeded treatment compared to the controls ($p = 0.007$, respectively; Fig. 3A) and varied among years ($p < 0.001$). In the final sampling year, perennial grass density was 3.3 times greater in the seeded treatment compared to the controls. Perennial grass density

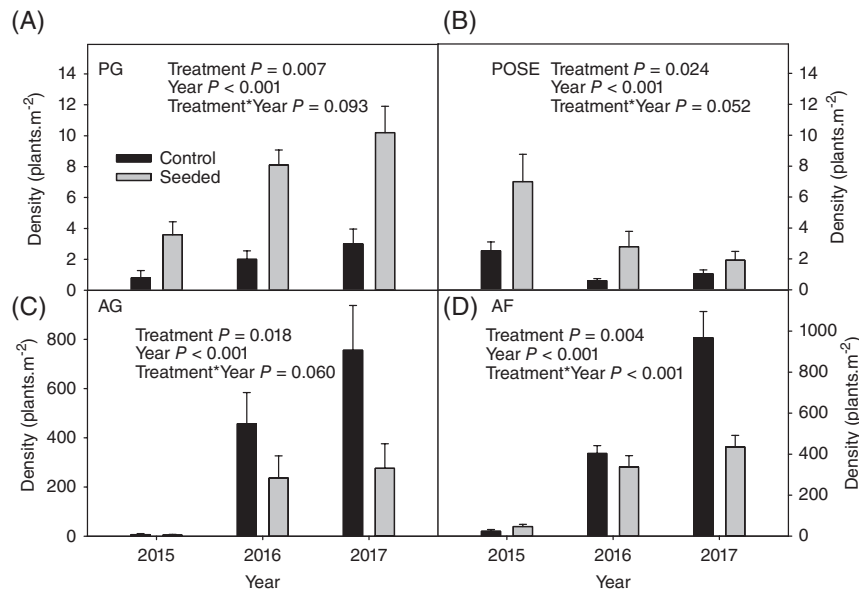


Figure 3. Herbaceous functional group density (mean + SE) in the seeded and control treatments in 2015, 2016, and 2017. PG, perennial grass (A); POSE, Sandberg bluegrass (B); AG, exotic annual grass (C); and AF, annual forb (D).

increased with time since seeding. Sandberg bluegrass density was greater in the seeded treatment compared to the controls and varied among years ($p=0.024$ and <0.001 , respectively; Fig. 3B). Sandberg bluegrass density generally decreased over time. Perennial forb density was similar between treatments and among years ($p=0.948$ and 0.610 , respectively). In the final sampling year, perennial forb density was 3.6 ± 1.8 and 4.2 ± 1.2 plants/m² in the seeded treatment and controls, respectively. Exotic annual grass density was greater in the controls compared to the seeded treatment ($p=0.018$; Fig. 3C) and varied among years ($p<0.001$). The controls had 270% greater exotic annual grass abundance than the seeded treatment 3 years after seeding. Exotic annual grass density increased with time in both treatments. Annual forb density was influenced by the interaction between treatment and year ($p<0.001$; Fig. 3D). Annual forb density was more similar between the controls than the seeded treatment in the first year, slightly greater in the controls than the seeded treatment in the second year, and more than two times greater in the controls compared to the seeded treatment in the third year. In the third sampling year, annual forb density was 532 plants/m² greater in controls compared to the seeded treatment. Juvenile sagebrush density was greater in the seeded treatment compared to the controls ($p<0.001$; Fig. 4A) but did not vary among years ($p=0.075$). Mature sagebrush density varied by the interaction between treatment and year ($p=0.004$; Fig. 4B). In the first year, neither treatment contained any mature sagebrush. However, in the second and third postfire year, mature sagebrush density was over 200 times greater in the seeded treatment compared to the controls (Fig. 4B). Sagebrush was only detected at two of the six unseeded controls. Density of other shrubs did not differ between treatments or among years ($p=0.460$ and 0.082 , respectively). In the final sampling year, other shrub density was

0.49 ± 0.43 and 0.38 ± 0.32 plants/m² in the controls and seeded treatment, respectively.

Discussion

Our results support the rationale for seeding after wildfires to increase perennial vegetation and limit exotic plants. The results of our study specifically support our hypotheses that seeding native perennial vegetation can increase perennial grass and sagebrush cover and density and reduce exotic annual grass and annual forb response after wildfire in western juniper-dominated sagebrush steppe in the western United States. These results suggest that seeding native perennial vegetation after wildfires may be needed to promote recovery and prevent exotic annual grass dominance in juniper-encroached sagebrush steppe. Importantly, our results suggest that seeding native vegetation after wildfire in juniper-encroached sagebrush communities is a viable restoration strategy. With the increase in area burned in wildfires in many regions (Krawchuk et al. 2009; Adams 2013), establishing that seeding native perennial species can increase perennial vegetation and limit exotic plants after wildfires provides critically needed guidance for postfire restoration. This is particularly important as other research (e.g. Stella et al. 2010) has suggested that postwildfire seeding is ineffective at reducing exotic plants.

Prior research demonstrated that exotic annual grasses could increase after prescribed fire in some juniper-encroached mountain big sagebrush communities with risk of annual grass dominance increasing with greater woodland development and with decreasing site resistance and resilience (Bates et al. 2014; Roundy et al. 2014; Davies & Bates 2017). The results from our unseeded plots further indicate that exotic annual grass invasion and dominance after fire in juniper-dominated mountain

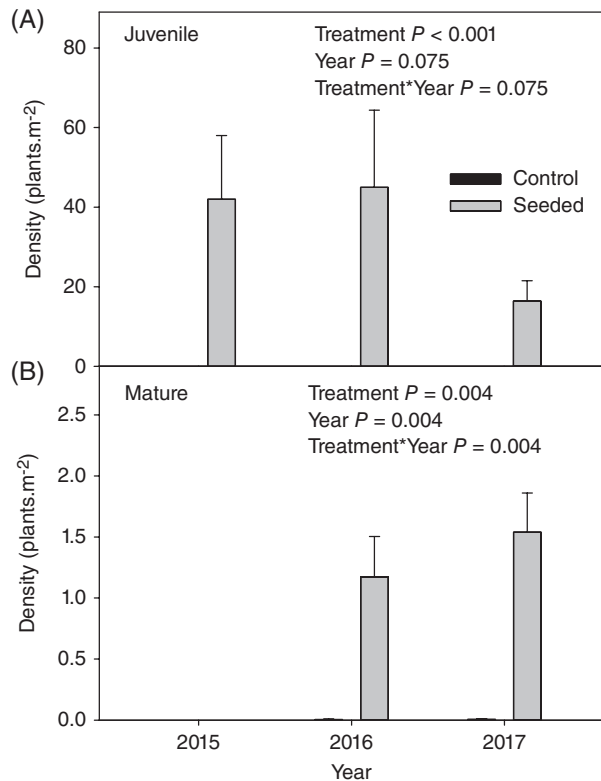


Figure 4. Sagebrush density (mean + SE) in the seeded and control treatments in 2015, 2016, and 2017. Juvenile, juvenile sagebrush (A) and mature, mature sagebrush (B).

big sagebrush steppe is of concern. This likely occurs because junipers decrease herbaceous vegetation as they dominate a site (Miller et al. 2000; Bates et al. 2005) and after fires the former juniper canopy locations are often devoid of vegetation and have high soil resource availability (Bates & Davies 2017; Davies et al. 2017). The abundance of soil resources and reduction in herbaceous vegetation, in particular perennial grasses, creates a perfect scenario for exotic annual grass invasion and dominance (Chambers et al. 2007).

Our results agree with prior research that establishing perennial vegetation is critical to limiting exotic annual species (Davies et al. 2015; Davies & Johnson 2017). This is particularly important after wildfires in areas susceptible to exotic annual grass invasion and dominance. Although exotic annual grass cover increased each year in areas not seeded, in areas seeded with native perennial vegetation, exotic annual grass cover peaked in the second-year postfire and declined almost 50% by the third-year postfire. This indicates that seeded vegetation may limited resources available to exotic annual grasses. Furthermore, this also suggests that the trajectory for the seeded areas is continued perennial vegetation dominance. At the end of the study, the areas not seeded were dominated by annual species (exotic annual grasses and annual forbs). The future trajectory of these communities is unknown but there is a high probability of continued exotic annual species dominance given

the low abundance of perennial grasses in these areas. Exotic annual grass dominance increases the risk of an annual grass-fire cycle developing because annual grasses dry out earlier and increase fine fuel loads and continuity compared to native vegetation (D'Antonio & Vitousek 1992). Increased fire frequency is especially detrimental to native vegetation that evolved with less frequent fire (D'Antonio & Vitousek 1992).

Sagebrush recovered rapidly after seeding with cover averaging 24% by the third-year postfire. However, sagebrush was largely absent from areas not seeded with sagebrush cover averaging less than 0.1% at the end of the study. Seeding sagebrush after juniper control with fire has generally accelerated the recovery of sagebrush cover and density (Davies et al. 2014; Davies & Bates 2017), except when herbaceous vegetation was allowed to recover prior to seeding sagebrush (Davies et al. 2017). These findings and the current study suggest the loss of sagebrush with juniper encroachment followed by fire that imposes strong juniper mortality results in a scenario of slow sagebrush recovery. This is counter to the assumption that sagebrush will often naturally recover rapidly after conifer control (Barney & Frischknecht 1974; Tausch & Tueller 1977; Skousen et al. 1989; Miller et al. 2005). Rapid recovery of sagebrush is needed because sagebrush is a crucial habitat component for sagebrush-associated wildlife species that are of conservation concern (Crawford et al. 2004; Shipley et al. 2006; Aldridge et al. 2008).

One caveat of our study was the high seeding rate, which was three or more times the rate often applied by land management agencies, especially for sagebrush. This may be one of the reasons that our results differ from other studies suggesting that postwildfire seeding is not effective (Peppin et al. 2010; Stella et al. 2010). Broadcast seeding after wildfires in juniper-dominated sagebrush communities as well as many other communities has not been empirically tested to establish optimal seeding rates. The high establishment of sagebrush and subsequent high cover of sagebrush probably limited perennial grass cover. As sagebrush cover increases, perennial grass production decreases (Cook & Lewis 1963; Rittenhouse & Sneva 1976). Our results, however, suggest that sagebrush and native perennial grasses can be seeded together. Additional research evaluating different seeding rates and ratios of different plant groups and species in seed mixtures would be valuable in establishing optimal seeding rates and mixtures. This is important because habitat requirements for sagebrush-associated wildlife often require a mixture of sagebrush and herbaceous species (e.g. Crawford et al. 2004).

Though our seeding rate was high, our study demonstrated that seeding native perennial vegetation after wildfire can promote recovery of perennial grasses and sagebrush and limit exotic annual grasses. Importantly, this suggests that seeding introduced species is not necessary to achieve management objectives after fire in mountain big sagebrush communities. This is a stark contrast to Wyoming big sagebrush communities, where seeded native vegetation often fails to establish (Eiswerth et al. 2009; Boyd & Davies 2010; Davies et al. 2015); however, there are exceptions (see Davies et al. 2018). Mountain big sagebrush communities are cooler and wetter than Wyoming

big sagebrush communities (West et al. 1978; Winward 1980; Hironaka et al. 1983) and this likely explains why seeded native vegetation often successfully establishes in these communities.

The high abundance and cover of exotic annual grasses in nonseeded areas at the end of the study suggests that seeding perennial vegetation is needed after wildfires in juniper-dominated sagebrush steppe to prevent exotic annual grass dominance and restore ecosystem services. This can be achieved by broadcast seeding native perennial grasses and sagebrush. Refinement of seeding mixtures and rates would be beneficial to improve restoration success and efficiency. We suggest that restoration practitioners consider seeding perennial vegetation after fires in juniper-dominated sagebrush communities, especially those at risk of exotic plant invasion.

Tree encroached-shrublands in Australia (Rundel et al. 2014), Africa (Holmes & Cowling 1997; Rundel et al. 2014), and South America (Sarasola et al. 2006; Langdon et al. 2010) may, similar to our current study, be at risk of postfire exotic plant invasion. Tree mortality from fire reduces competition and opens the plant community to exotic plant invasion. This may be even more problematic if tree encroachment or the fire that controls the trees reduces understory species that are keys for resistance to exotic plant invasion. Our results demonstrate that seeding native perennial vegetation after wildfire is a method that can counter this threat.

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Attachment 6

Contested Case Order (CCO), as Amended and
Adopted by Council

**BEFORE THE ENERGY FACILITY SITING COUNCIL OF THE
STATE OF OREGON**

IN THE MATTER OF:) **CONTESTED CASE ORDER**
)
THE APPLICATION FOR SITE) **OAH Case No. 2019-ABC-02833**
CERTIFICATE FOR THE)
BOARDMAN TO HEMINGWAY)
TRANSMISSION LINE)

This Contested Case Order (CCO) is Attachment 6 of the Final Order on the Application for Site Certificate for the Boardman to Hemingway Transmission Line (Final Order on the ASC). The CCO is incorporated directly and by reference into the Final Order on the ASC.

On September 27, 2022, the Energy Facility Siting Council (EFSC or Council) adopted the Hearing Officer's May 31, 2022 Proposed Contested Case Order (PCCO), with modifications, as the CCO. The modifications resulted from their August 29-31, 2022 review of the PCCO and hearing on exceptions and responses. Modifications to the PCCO, as adopted in the CCO are listed below:

- Additional facts on the record were added to findings of fact, after #68, to support the evaluation of Issue HCA-3
- Correction incorporated to the Opinion for Issue SS-5 to clarify that the extent of work conducted to date was reconnaissance level
- Reasoning added to address proposed conditions improperly dismissed on "untimely" in Closing Arguments, as had been presented in the Proposed Contested Case Order
 - Marlette Proposed Conditions for Issue M-6
 - Geer Revised Condition related to Trifolium douglasii
 - Gilbert Proposed Condition for Issue FW-9
 - Gilbert Proposed Condition for Issue FW-3
 - Geer Proposed Condition for Issue FW-3
 - Gilbert Proposed Condition for Issue HCA-3
 - Williams Proposed Condition for Issue HCA-7
 - Gilbert Proposed Condition for Issues LU-7 and LU-8
 - Gray Proposed Condition for Issue NC-6
 - STOP B2H's Proposed Condition for Issue NC-1
 - STOP B2H's Proposed Condition for Issue NC-2
 - Cooper Proposed Condition for Issue PS-4
 - Gilbert Proposed Condition for Issue RFA-1

HISTORY OF THE CASE

This matter involves the Application for a Site Certificate (ASC) for the Boardman to Hemingway Transmission Line (Project or proposed facility) submitted by Idaho Power Company (Idaho Power or Applicant) to the Energy Facility Siting Council (Council or EFSC). The Oregon Department of Energy (Department or ODOE) determined the ASC was complete on September 21, 2018. On May 16, 2019, the Council appointed Senior Administrative Law

Judge (ALJ) Alison Greene Webster of the Office of Administrative Hearings (OAH) as the hearing officer in this matter.

On May 22, 2019, the Department issued a Draft Proposed Order (DPO), public notice of a comment period on the DPO, and notice of public hearings on the DPO. On June 13, 2019, the Department referred this matter to the OAH for the ALJ to facilitate the public hearings and conduct the contested case proceedings. Thereafter, on June 18, 19, 20, 26, and 27, 2019, ALJ Webster held public hearings on the DPO.¹ Members of the public had the opportunity to provide oral and written comments at the public hearings. At the June 26, 2019 hearing in Pendleton, Oregon, the Council extended the public comment period to August 22, 2019, and extended Idaho Power's deadline to respond to the DPO comments to September 23, 2019.

On July 2, 2020, the Department issued a Proposed Order on Application for Site Certificate. The Department set August 27, 2020 at 5:00 p.m. Pacific Time as the filing deadline for submitting petitions for party or limited party status in the above-captioned matter.

On September 8, 2020, the ALJ issued an *Amended Notice of Petitions to Request Party Status; Order Scheduling Pre-Hearing Conference*, notifying the Department and Idaho Power of the petitions for party status or limited party status received in this matter. On September 16, 2020, in response to the Department's Request for Clarification, the ALJ issued a *Second Amended Notice of Petitions to Request Party Status; Order Scheduling Pre-Hearing Conference*.

¹ The June 18, 2019 public hearing was held in Ontario, Oregon; the June 19, 2019 hearing was held in Baker City, Oregon; the June 20, 2019 hearing was held in La Grande, Oregon; the June 26, 2019 hearing was held in Pendleton, Oregon; and the June 27, 2019 hearing was held in Boardman, Oregon.

First Prehearing Conference: On September 25, 2020, the ALJ convened a prehearing conference by telephone to address the petitions for party or limited party status and the Department and Idaho Power's responses to the petitions. The ALJ continued the prehearing conference to October 1, 2020 to complete the agenda. At the September 25, 2020 prehearing conference, the ALJ provided petitioners for party status an opportunity to address whether they had satisfied the eligibility requirements for party or limited party status. The ALJ provided Idaho Power and the Department the opportunity to respond.

At the October 1, 2020 continued telephone prehearing conference, the ALJ provided petitioners for party status the opportunity to clarify their interests in the outcome of the proceeding and the issues identified in their respective petitions. Likewise, the ALJ provided Idaho Power and the Department the opportunity to respond. The ALJ granted the petitioners leave to file supplemental written arguments, and granted the Department and Idaho Power leave to file amended responses to the petitions for party and limited party status.

Order on Party Status: On October 29, 2020, the ALJ issued an *Order on Petitions for Party Status, Authorized Representatives and Issues for Contested Case (Order on Party Status)*. The *Order on Party Status* addressed the applicable law to establish standing in a contested case proceeding on an application for site certificate and the limitations on party status. In addition, the *Order on Party Status* granted limited party status to 35 petitioners, denied limited or full party status to 18 petitioners, identified 70 properly raised discrete contested case issues and denied 47 issues.

On October 30, 2020, the Council notified the parties and petitioners for party status that the Council would review any properly filed appeals of the ALJ's *Order on Party Status* during its November 19-20, 2020 Council Meeting.

On November 9, 2020, the ALJ issued a *Notice to Council of Appeals Pursuant to OAR 345-015-0016(6) and Corrected Table of Identified Issues (Notice to Council)*. The *Notice to Council* identified the 26 petitioners that timely filed appeals on the *Order on Party Status*.

On November 20, 2020, the Council held a hearing on the appeals. The Council continued the hearing to November 25, 2020 through a Special Council Meeting. Following the hearing on November 25, 2020, the Council issued an *Order on Appeals of Hearing Officer Order on Party Status, Authorized Representatives and Issues (Order on Appeals)*. In the *Order on Appeals*, the Council directed the ALJ to grant one additional petitioner limited party status; clarify three issues; and grant eight additional issues as properly raised issues in the contested case. The Council directed the ALJ to issue an amended *Order on Party Status* based on the final list of parties with standing on issues and the list of identified issues set out in the *Order on Appeals*.

Amended Order on Party Status: On December 4, 2020, in accordance with the Council's *Order on Appeals*, the ALJ issued an *Amended Order on Party Status*. Concurrently with the *Amended Order on Party Status*, the ALJ issued the *Notice of Pre-Hearing Conference; Pre-Hearing Conference Agenda on Case Management Matters; Proposed Contested Case*

Schedule and Revised Service List. That notice set the prehearing conference for January 7, 2021.

On December 22, 2020, in response to queries from limited party Irene Gilbert, the ALJ issued a *Response to Request for Clarification Regarding OAR 345-015-0022, Petitions for Indigent Status*. The response set out the definition of indigent and the eligibility standard for purposes of OAR 345-015-0022.

On January 4, 2021, in response to a question from limited party Charles Gillis, the ALJ issued a *Response to Question Regarding Attendance at Pre-Hearing Conference on Contested Case Matters*. The response clarified that once the parties, limited parties and issues for the contested case are identified, a party or limited party does not lose standing to participate in the contested case under OAR 345-015-0083 by failing to attend a prehearing conference on case management or scheduling matters.

Prehearing Conference on Case Management Matters and Case Management Order: On January 7, 2021, the ALJ convened a telephone Prehearing Conference on Case Management Matters with the parties and limited parties. Thereafter, on January 14, 2021, the ALJ issued an *Order on Case Management Matters and Contested Case Schedule (Case Management Order)*, setting out the following: the parties and limited parties; the identified issues in the contested case and parties/limited parties with standing on the issue(s); the manner for joint presentation of public issues where more than one limited party has standing; guidelines for filing and serving documents; naming conventions; the contested case process; and the contested case schedule.

In addition, the ALJ, in her discretion, authorized motions for summary determination. In the *Case Management Order*, the ALJ established the deadlines for filing such motions, the responses to the motions, and any reply briefs.

On February 3, 2021, in response to motions from limited party Irene Gilbert, the ALJ issued a *Response to Motions for Clarification Regarding Informal Discovery Requests*. The response explained that it was not appropriate for the ALJ to rule on objections to informal discovery requests or to provide legal advice or direction to the parties and/or limited parties regarding the informal exchange of information.

Discovery Phase: As of February 19, 2021, the ALJ received 36 requests for discovery orders. The ALJ received requests from Idaho Power and limited parties K. Andrew, Badger-Jones, Lois Barry (2 requests), Peter Barry, Cooper (3 requests), Eastern Oregon University (EOU), Geer (2 requests), Gillis, Mammen (4 requests), March (2 requests), Marlette, McAllister (2 requests), STOP B2H, Webster (12 requests) and Williams. Ms. Gilbert requested and received an extension of the filing deadline and subsequently submitted four motions seeking discovery from the Union County Planning Department and the Oregon Department of Fish and Wildlife (ODFW) and additional discovery from Idaho Power and the Department. Limited parties Anne and Kevin March later withdrew their request for discovery from ODFW.

On March 4 and 5, 2021, the ALJ issued 24 separate rulings denying limited parties' requests for discovery (interrogatories and requests for production of documents) from non-

parties to the contested case.² In the rulings, the ALJ explained that she had no authority to compel a non-party to the contested case to respond to written questions and/or to produce requested documents. The ALJ granted the limited parties leave, until April 2, 2021, to file a written request to take the deposition of a material witness in accordance with ORS 183.425 and OAR 137-003-0025.

Between March 16 and 26, 2021, the ALJ issued an additional 15 separate rulings on requests for discovery. The ALJ partially granted Idaho Power's motion, ordering limited parties Miller, Myers, and Proesch to respond to Idaho Power's discovery requests by April 16, 2021. In addition, the ALJ granted Idaho Power's request for an order establishing a September 3, 2021 deadline for parties and limited parties to identify expert witnesses and hearing exhibits for direct testimony.

The ALJ denied Lois Barry's requests for discovery orders to Idaho Power and the Department, sustaining the objections and finding that Idaho Power and the Department sufficiently responded to the discovery requests. The ALJ denied Peter Barry's request for a discovery order to Idaho Power, sustaining Idaho Power's objections and finding that Idaho Power sufficiently responded to the discovery requests. The ALJ denied EOU's request for a discovery order to Idaho Power, sustaining Idaho Power's objections and finding that the company sufficiently responded to the discovery requests. The ALJ denied Susan Geer's request for a discovery order to Idaho Power, sustaining Idaho Power's objections and finding that Idaho Power sufficiently responded to the discovery requests. The ALJ denied Irene Gilbert's requests for discovery orders to Idaho Power and the Department, sustaining the objections and finding that the parties sufficiently responded to the discovery requests. The ALJ denied Charles Gillis' request for an order compelling Idaho Power to respond further or produce additional discovery. The ALJ denied the Marches' request for an order to Idaho Power, sustaining objections and finding that Idaho Power sufficiently responded to the discovery requests.

In addition, the ALJ denied JoAnne Marlette's request for a discovery order compelling Idaho Power to provide a further response. The ALJ denied Michael McAllister's requests for discovery orders to Idaho Power and the Department, sustaining the objections and finding that the parties sufficiently responded to the discovery requests. The ALJ denied the STOP B2H Coalition's request for discovery from ODFW based on lack of jurisdiction and the request for further discovery from Idaho Power, finding that Idaho Power sufficiently responded to the requests. The ALJ denied Stacia Webster's request for further discovery from the Department, sustaining the Department's objections and finding that the Department provided responsive answers to the questions posed. Finally, the ALJ denied John Williams' request for additional discovery from Idaho Power, finding that Idaho Power provided adequate responses.

² This included the Union County Planning Department; Union County Public Works Department; Union County Emergency Services Department; Union County Weed Supervisor; the City of La Grande; La Grande Rural Fire Department; Avista; Grande Ronde Hospital; Terra Firma; US Forest Service; Adrian Rural Fire Protection District; Baker City Rural Fire Department; Bureau of Land Management-Baker Field Office; Boardman Fire Department; Huntington Fire Department; Ione Fire Department; North Powder Rural Fire Department; ODFW; and the Oregon Department of Forestry.

Material Witness Depositions: On April 2, 2021, the ALJ received three petitions for depositions of material witnesses: (1) Matt Cooper and Stacia Webster's Petition for Deposition of Craig Kretschmer of La Grande Rural Fire Protection District; Issues PS-4 and PS-10; (2) Susan Geer's Petition for Deposition of Brian Clapp, Union County Weed Supervisor, Issues FW-3, FW-6 and SR-5; and (3) Irene Gilbert's and Kathryn Andrew's Petition for Deposition of Scott Hartell of Union County Planning, with request for subpoena *duces tecum*, Issues LU-3, LU-5, LU-7 and LU-8. On April 15, 2021, the ALJ signed and issued the deposition subpoenas. The depositions of Mr. Kretschmer and Mr. Clapp took place in May 2021 and the deposition of Mr. Hartell took place in June 2021.

Notice of Ex Parte Communication: On May 7, 2021, the ALJ received notice from Council that, on April 22, 2021, in advance of the April 2021 Council meeting, Idaho Power submitted a letter to the Council outlining its concerns regarding potential rulemaking revisions and updates to the siting standards related to Protected Areas, Scenic Resources, and Recreation Resources. The Council requested that the ALJ provide notice to all parties of the substance of Idaho Power's April 22, 2021 letter to the Council pursuant to OAR 137-003-0055.

On May 11, 2021, the ALJ issued a *Notice of Ex Parte Communication Pursuant to OAR 137-003-0055(2)*, attaching a copy of Idaho Power's April 22, 2021 letter to the Council, and providing any party/limited party the opportunity to rebut the substance of the ex parte communication. Limited parties STOP B2H, Lois Barry, Lyons, Geer, Gilbert, McAllister and Eastern Oregon University filed timely rebuttals to Idaho Power's April 22, 2021 letter.

B2H Project Record Admitted into the Contested Case Hearing Record: On May 26, 2021, in response to an inquiry from the Department, the ALJ issued a *Response to ODOE's Inquiry Re: Marking and Submitting Exhibits*. In that response, for the convenience of the parties and limited parties in the contested case, the ALJ admitted the entirety of the Decision-Making and Administrative Project Record for the Boardman to Hemingway Transmission Line (the B2H Project Record) into the contested case hearing record.

Summary Determination Phase: On May 28, 2021, in accordance with the established Contested Case Schedule, Idaho Power timely filed 13 motions for summary determination.³ Also on May 28, 2021, the Department timely filed eight motions for summary determination.⁴

³ Idaho Power filed motions for summary determination on the following issues:

- (1) Issues SR-1, SR-4, SR-5, and SR-6 (Lois Barry; Moyal/D. White; Geer; STOP B2H);
- (2) Issues FW-1, FW-2, and FW-12 (STOP B2H/Squire; EOU; A. March);
- (3) Issues M-1, M-2, M-3, M-4, M-5, and M-7 (Badger-Jones; Gilbert; Cooper; Howell; Proesch);
- (4) Issue SS-4 (Mammen);
- (5) Issues LU-1, LU-2, LU-3, LU-5, and LU-6 (EOU; K. Andrew; Gilbert; Gilbert);
- (6) Issues HCA-2 and HCA-5 (Carbiener; Miller);
- (7) Issues N-1, N-2, and N-3 (STOP B2H);
- (8) Issue R-2 (Lois Barry and McAllister);
- (9) Issue SP-2 and FW-13 (McAllister);
- (10) Issue NC-5 (Gilbert);
- (11) Issue RFA-3 (Gillis);
- (12) Issue FW-9, FW-10, FW-11, and LU-10 (Applicant); and

On June 1, 2021, limited party Gilbert filed a request for clarification regarding the summary determination process and the procedures for responding to such motions. On June 2, 2021, the ALJ issued a *Response to Irene Gilbert's Request for Clarification Re Responses to Motions for Summary Determination* providing the requested clarification.

On June 1, 2021, Ms. Gilbert also filed a Motion to Dismiss All Motions for Summary Determination. On June 4, 2021, Idaho Power filed a response to the motion, and on June 8, 2021, Ms. Gilbert filed a reply. On June 9, 2021, the ALJ issued a *Ruling on Limited Party Irene Gilbert's Request to Dismiss All Motions for Summary Determination*, denying Ms. Gilbert's Motion to Dismiss.

On June 9, 2021, limited party McAllister filed a Motion to Amend Contested Case Schedule. On June 11, 2021, Idaho Power filed a response to the motion. On June 15, 2021, the ALJ issued a *Ruling on Limited Party McAllister's Motion to Amend Contested Case Schedule*, denying Mr. McAllister's request to adjust and extend the contested case hearing schedule.

On June 10, 2021, limited party Carbiener filed a Request for Consideration as Limited Party for Issue HCA-5 and to Respond by June 25, 2021 to Motion for Summary Determination. On June 16, 2021, the Department filed an Objection to Mr. Carbiener's Request and on June 17, 2021, Idaho Power filed its Response to Mr. Carbiener's Request. On June 21, 2021, the ALJ issued a *Ruling on Limited Party Gail Carbiener's Motion for Standing to Respond on Contested Case Issue HCA-5*, denying the request based upon OAR 345-015-0016 and OAR 137-003-0040(3)(b).

On June 16, 2021, limited party Kevin March filed a request for clarification regarding document naming in the B2H Project Record and a request to extend the June 25, 2021 deadline to respond to motions for summary determination. On June 21, 2021, the ALJ issued a *Response to Limited Party Kevin March's Request for Clarification and Ruling on Motion to Extend Summary Determination Response Deadline*. The ALJ declined to extend the response deadline for all parties and limited parties subject to motions for summary determination.

On June 17, 2021, Mr. McAllister filed a Second Motion to Amend Deadline for Responding to Motions for Summary Determination for Good Cause. Mr. McAllister described circumstances, personal to him, preventing him from filing timely responses to the motions for

(13) Issue TE-1 (Geer).

⁴ The Department filed the following motions:

- (1) Issue FW-4 (Gilbert);
- (2) Issue FW-13 (McAllister);
- (3) Issue LU-1 (EOU);
- (4) Issue N-2 (STOP B2H);
- (5) Issue SP-2 (McAllister);
- (6) Issue SR-1 (Lois Barry);
- (7) Issue SR-4 (Moyal/D. White); and
- (8) Issue TE-1 (Geer).

summary determination on Issues FW-13 and SP-2. On June 23, 2021, the ALJ issued a *Ruling on Limited Party McAllister's Second Motion to Extend Deadline for Responding to Motions for Summary Determination for Good Cause*, finding good cause to extend the deadline for Mr. McAllister's responses to July 9, 2021.

On June 23, 2021, Ms. Gilbert filed a request for an extension of time to submit responses to motions for summary determination, seeking a two-week extension of the June 25, 2021 deadline to file her responses to Idaho Power's and the Department's motions. On June 24, 2021, the ALJ issued a *Ruling on Limited Party Irene Gilbert's Request to Extend Deadline for Responding to Motions for Summary Determination*, finding that Ms. Gilbert had not shown good cause to extend her deadline and denying the request.

On June 25, 2021, the ALJ received the parties/limited parties' responses to the motions for summary determination.⁵ The ALJ did not receive responses from limited parties on the following issues subject to summary determination motions: Issue M-1 (Badger-Jones), Issue M-3 (Cooper), Issues M-4 and M-5 (the Howells), Issue M-7 (Proesch), Issue HCA-5 (Miller); Issue NC-5 (Gilbert); Issue SR-1 (L. Barry); and Issue SR-4 (Moyal and D. White).

On July 9, 2021, the ALJ received additional replies from Mr. McAllister in response to the Department and Idaho Power's motions for summary determination.⁶ Also on July 9, 2021, the ALJ received replies from Idaho Power⁷ and the Department.⁸ On July 23, 2021, Idaho

⁵ The ALJ received the following: (a) Idaho Power's Response to the Department's Motions for Summary Determination; (b) The Department's Responses to Applicant's Motions for Summary Determination of Limited Party Issues; (c) SSTOP B2H Coalition's Opposition to Motion on Issue FW-1; Stop B2H's Opposition to Motions on Issues N-1, N-2, and N-3; STOP B2H's Opposition to Motion on Issue SR-6; (d) Kathryn Andrew's Response to Motion on Issue LU-3; (e) Lois Barry's Responses on Issues R-2 and SR-6; (f) Gail Carbiener's Response on Issue HCA-2; (g) Susan Geer's Responses on Issues SR-5 and TE-1; (h) Irene Gilbert's Responses on Issues M-2; FW-4; and LU-5; (i) Charles Gillis' Response on Issue RFA-3; (j) Anne March's Response on Issue FW-12; (k) Michael McAllister's Response on Issue R-2; and (l) Louise Squire's Response on Issue FW-1.

⁶ The ALJ received the following: (1) Mr. McAllister's Opposition to Idaho Power's Motion on Issues FW-13 and SP-2; (2) Mr. McAllister's Opposition to the Department's Motion on Issue FW-13; and (3) Mr. McAllister's Opposition to the Department's Motion on Issue SP-2.

⁷ The ALJ received the following reply briefs from Idaho Power: (1) Reply to STOP B2H's Response to Motion on Issues N-1, N-2, and N3; (2) Reply to Susan Geer's Response to Motion on Issue TE-1; (3) Reply to ODOE's and Irene Gilbert's Responses to Motions on Issues FW-9, FW-10, FW-11 and LU-10; (4) Reply to Limited Parties' Responses to Motions on Issues SR-1, SR-4, SR-5 and SR-6; (5) Reply to Limited Parties' Responses to Motion on Issues HCA-2 and HCA-5; (6) Reply to Limited Parties' Responses to Motion on Issues M-1, M-2, M-3, M-4, M-5, and M-7; (7) Reply to Limited Parties' Responses to Motion on Issues FW-1 and FW-12; (8) Reply to Limited Parties' Responses to Motion on Issue R-2; (9) Reply to Limited Parties' Responses to Motion on Issues LU-2, LU-3, LU-5, and LU-6; (10) Reply to Irene Gilbert's Response to Motion on Issue NC-5; (11) Reply to Dale and Virginia Mammen Response to Motion on Issue SS-4; and (12) Reply to Charles Gillis' Response to Motion on Issue RFA-3.

Power and the Department filed Replies to Mr. McAllister's oppositions to the respective motions on Issues FW-13 and SP-2.

Between July 14, 2021 and August 17, 2021, the ALJ issued the following Rulings and Orders on Motions for Summary Determination:

- (1) July 14, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue M-7*, granting Idaho Power's motion and dismissing Issue M-7 and limited party Tim Proesch from the contested case.
- (2) July 14, 2021, *Rulings and Order on Motion for Summary Determination of Contested Case Issues M-1, M-2, M-3, M-4, and M-5*, granting Idaho Power's motion(s) and dismissing Issues M-1, M-2, M-3, M-4, and M-5 from the contested case.
- (3) July 14, 2021, *Rulings and Order on Motions for Summary Determination of Contested Case Issue SR-4, Limited Parties David Moyal and Daniel White*, granting Idaho Power's motion, granting the Department's motion, dismissing Issue SR-4 and limited parties David Moyal and Daniel White from the contested case.
- (4) July 14, 2021, *Ruling and Order on Motions for Summary Determination on Contested Case Issue SR-1*, granting Idaho Power's motion, granting the Department's motion and dismissing Issue SR-1 from the contested case.
- (5) July 20, 2021, *Ruling and Order on Motions for Summary Determination of Contested Case Issue TE-1*, granting Idaho Power's motion, granting the Department's motion and dismissing Issue TE-1 from the contested case.
- (6) July 20, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue RFA-3*, granting Idaho Power's motion, dismissing Issue RFA-3 and limited party Charles Gillis from the contested case.
- (7) July 21, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issues LU-2, LU-3, LU-5, and LU-6*, granting Idaho Power's motion(s) and dismissing Issues LU-2, LU-3, LU-5, and LU-6 from the contested case.
- (8) July 21, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue SR-5*, granting Idaho Power's motion and dismissing Issue SR-5 from the contested case.

⁸ The ALJ received the following reply briefs from the Department: (1) Reply to Limited Party Response on Issue TE-1; (2) Response to Limited Party Response on Issue N-2; and (3) Response to Limited Party Response on Issue FW-4.

- (9) July 23, 2021, *Ruling and Order on Motion for Summary Determination on Contested Case Issue SS-4*, granting Idaho Power's motion and dismissing Issue SS-4 from the contested case.
- (10) July 26, 2021, *Ruling and Order on Motion for Summary Determination on Contested Case Issue SR-6*, granting Idaho Power's motion and dismissing Issue SR-6 from the contested case.
- (11) July 29, 2021, *Ruling and Order on Motions for Summary Determination of Contested Case Issues N-1, N-2, and N-3*, granting Idaho Power's motions on Issues N-1, N-2, and N-3, granting the Department's motion on Issue N-2, and dismissing Issues N-1, N-2, and N-3 from the contested case.
- (12) August 3, 2021, *Ruling and Order on Motions for Summary Determination of Contested Case Issues FW-13, R-2, and SP-2*, granting Idaho Power's motions on Issues FW-13, R-2, and SP-2; granting the Department's motions on Issues FW-13 and SP-2; dismissing Issues FW-13, R-2, and SP-2 from the contested case; and dismissing limited party Michael McAllister from the contested case.
- (13) August 5, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue FW-1*, granting Idaho Power's motion on Issue FW-1; dismissing Issue FW-1 from the contested case; and dismissing limited party Louise Squire from the contested case.
- (14) August 9, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue NC-5*, granting Idaho Power's motion and dismissing Issue NC-5 from the contested case.
- (15) August 10, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issues HCA-2 and HCA-5*, granting Idaho Power's motion and dismissing Issues HCA-2 and HCA-5 from the contested case.
- (16) August 12, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue FW-4*, granting the Department's motion and dismissing Issue FW-4 from the contested case.
- (17) August 13, 2021, *Ruling and Order on Motion for Summary Determination of Contested Case Issue FW-12*, granting Idaho Power's motion and dismissing Issue FW-12 from the contested case.
- (18) August 17, 2021, *Ruling and Order on Idaho Power Company's Motion for Summary Determination of Contested Case Issues FW-9, FW-10, FW-11, and LU-10*, granting Idaho Power's motion.

On July 28, 2021, Ms. Gilbert filed a Petition for Reconsideration of the Decision Allowing Summary Determination Denying My Contested Case [Issue] LU-5 (Petition for

Reconsideration). On July 29, 2021, Ms. Gilbert filed supplemental material in support of her Petition for Reconsideration. On August 24, 2021, the ALJ issued a *Ruling Denying Limited Party Irene Gilbert's Petition for Reconsideration of the Ruling and Order on Motion for Summary Determination of Contested Case Issue LU-5*.

On August 10, 2021, Mr. McAllister filed an interlocutory appeal to the Council of the ALJ's August 3, 2021 *Ruling and Order on Motions for Summary Determination of Contested Case Issues FW-13, R-2, and SP-2*. The Department and Idaho Power filed responses to the appeal.

At its August 27, 2021 Council meeting, the Council conducted a hearing on the interlocutory appeal. In an *Order on Interlocutory Appeal for Administrative Law Judge's Ruling on Motion for Summary Determination for Limited Party McAllister's Issues FW-13, SP-2 and R-2*, issued September 17, 2021, the Council affirmed the ALJ's Ruling dismissing Issues FW-13 and SP-2, and reversed the dismissal of Issue R-2. The Council reinstated Mr. McAllister as a limited party with standing on Issue R-2.

Motion to Remove Hearing Officer: On July 26, 2021, Ms. Gilbert filed with the Council a Motion for Removal of Ms. Webster as Hearings Officer for B2H. On August 2, 2021, Idaho Power filed a Response to Ms. Gilbert's Motion to Remove Hearing Officer. The Council addressed the motion and response its August 27, 2021 meeting. On September 21, 2021, the Council issued an *Order on Limited Party Gilbert's Motion to Remove Hearing Officer*, denying the motion and concluding that Ms. Gilbert did not present substantial evidence to prove bias, incompetence, or both for the actions or category of actions identified in the motion.

Limited Party Withdrawals: On February 17, 2021, during the discovery phase, limited party John Milbert submitted a notice of withdrawal from the contested case. Thereafter, on February 22, 2021, the ALJ issued an Acknowledgement of Withdrawal of Limited Party and Contested Case Issue FW-8, acknowledging Mr. Milbert's withdrawal from the case and dismissing Issue FW-8 from the contested case.

On June 24, 2021, during the summary determination phase, limited party Eastern Oregon University/Dr. Karen Antell submitted a notice of withdrawal from the contested case. On June 29, 2021, the ALJ issued an Acknowledgement of Withdrawal of Limited Party Eastern Oregon University and Contested Case Issues LU-1 and FW-2, acknowledging the withdrawal and dismissing Issues LU-1 and FW-2 from the contested case.

On July 25, 2021, limited party Ryan Browne submitted a notice of withdrawal from the contested case. On July 27, 2021, the ALJ issued an Acknowledgement of Withdrawal of Limited Party Ryan Browne and Contested Case Issue HCA-1 acknowledging the withdrawal and dismissing Issue HCA-1 from the contested case.

On August 3, 2021, limited parties Jane and Jim Howell submitted their notice of withdrawal from the contested case. That same date, the ALJ issued an Acknowledgement of

Withdrawal of Limited Parties Jane and Jim Howell and Contested Case Issue PS-7, acknowledging the withdrawal and dismissing Issue PS-7 from the contested case.

Second Prehearing Conference/Second Case Management Order: On August 26, 2021, the ALJ convened a second telephone prehearing conference to address requests from the limited parties for clarification on procedural matters pertaining to naming conventions and the filing and service of documents, including written direct testimony and written rebuttal testimony.

On August 30, 2021, the ALJ issued a *Second Order on Case Management Matters and Contested Case Schedule*, with clarifications of procedural matters, a revised list of parties and limited parties, and a revised table of identified issues and parties with standing on the issues.

Direct Testimony: As of the September 17, 2021 deadline for filing direct testimony and evidence pursuant to OAR 345-015-0043 and proposed site certificate conditions pursuant to OAR 345-015-0085, the ALJ received written direct testimony and/or exhibits on 33 issues⁹ along with proposed site certificate conditions from limited parties Carbiener, Cooper, Fouty, Geer, Gilbert, March, STOP B2H and Webster.

The ALJ did not receive written direct testimony or exhibits for Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2.

Motion to Dismiss Issues: On September 29, 2021, Idaho Power filed a Motion to Dismiss Contested Case Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2, requesting dismissal of those issues for which the limited parties did not file testimony or evidence. The Department filed a Response to the Motion. Limited parties Matthew Cooper, Irene Gilbert, and Stacia Webster filed objections to the Motion.

On October 8, 2021, the ALJ issued a *Ruling on Idaho Power Company's Motion to Dismiss Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2*, granting the motion.

On October 15, 2021, the Department filed a Motion to Reconsider Dismissal of Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2. On October 19, 2021, limited party STOP B2H filed an Amicus Memorandum in support of the Department's Motion to Reconsider and, on October 20, 2021, limited party Irene Gilbert similarly filed an Amicus Memorandum. On October 22, 2021, Idaho Power filed its Response to the Department's Motion to Reconsider.

On October 25, 2021, the ALJ issued an *Order Granting Reconsideration and Withdrawing Ruling on Idaho Power Company's Motion to Dismiss Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2*.

⁹ The ALJ received written direct testimony and/or exhibits for the following issues: M-6, FW-3, FW-6, FW-7, HCA-3, HCA-4, HCA-7, LU-9, LU-11, NC-1, NC-2, NC-3, NC-4, NC-6, PS-2, PS-3, PS-4, PS-6, PS-8, PS-9, PS-10, R-1, R-2, R-3, R-4, RFA-1, RFA-2, SR-1, SR-3, SR-7, SP-1, SS-3, and SS-5.

Thereafter, on November 2, 2021, the ALJ issued a *Ruling on Idaho Power Company's Motion to Dismiss Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2 (Ruling on Motion to Dismiss)*, declining to dismiss these issues. The ALJ found that because Idaho Power retains the burden under OAR 345-021-0100(2) to prove the proposed facility complies with applicable statutes and siting standards, it was not appropriate to dismiss these issues from the contested case despite the limited parties' failure to submit written direct testimony or exhibits in support of these issues. The ALJ further found that by failing to present any written direct testimony and supporting exhibits by the September 17, 2021 deadline, the limited parties with standing on Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1, and SS-2 waived their opportunity to present any testimony or new evidence in support of their claims.

Rulings on Objections to Direct Testimony and Exhibits: On October 1, 2021, both Idaho Power and the Department filed Objections to the Limited Parties' Direct Testimony and Exhibits. The following limited parties filed responses to the Department's and Idaho Power's objections: STOP B2H, Cooper, Deschner, Geer, Gilbert, Lyons, Mammen, March, Myers, and Webster.

On October 15, 2021, the ALJ issued *Rulings on Objections to Direct Testimony and Exhibits*, determining the admissibility of evidence to which the Department and/or Idaho Power objected.

On October 21, 2021, the ALJ issued a *List of Direct Testimony and Exhibits Admitted into the Contested Case Record*, identifying, by issue code and number, the written direct testimony and new evidence admitted into the contested case hearing record as of October 15, 2021.

Limited parties STOP B2H, Gilbert, March, and Marlette filed motions seeking reconsideration of the ALJ's rulings sustaining Idaho Power's objections and excluding certain direct testimony and exhibits.

On November 2, 2021, the ALJ issued a *Ruling on Anne and Kevin March's Motion to Reconsider Rulings on Objections to Direct Testimony and Exhibits – Issue FW-7*, declining to reconsider the rulings and denying the Motion to Reconsider. Also on November 2, 2021, the ALJ issued a *Ruling on Irene Gilbert's Motion to Reconsider Rulings on Objections to Direct Testimony and Exhibits – Issues NC-2 and LU-11*, denying the Motion to Reconsider.

On November 5, 2021, the ALJ issued a *Ruling on STOP B2H Coalition's Motion to Reconsider Ruling on Objections to Direct Testimony and Exhibits – Issues NC-2 and SR-7*, denying the Motion to Reconsider. On November 9, 2021, the ALJ issued a *Ruling on JoAnn Marlette's Motion to Reconsider Ruling on Objections to Exhibit 7 – Issue HCA-3*, denying the Motion to Reconsider.

Status Conference/Third Case Management Order: On November 4, 2021, the ALJ convened a status conference by telephone to discuss logistics for the cross-examination hearing. The ALJ notified the parties and participants that, due to the ongoing COVID-19 pandemic and

restrictions on in-person gatherings, she would be holding the cross-examination hearing virtually, via the Cisco WebEx platform.

On November 9, 2021, the ALJ issued a *Third Order on Case Management Matters and Guidelines for the Virtual Cross-Examination Hearing*.

On November 22, 2021, in follow up to the *Third Order on Case Management*, the ALJ issued a *Response to Idaho Power Company's Request for Clarification Regarding Procedures for Responding to Surrebuttal Evidence and New Proposed Site Certificate Conditions*. That same date, the ALJ issued an *Amended Response* to correct an omission in the original Response.

Rebuttal Evidence: The deadline for submitting rebuttal testimony and evidence, and responses to proposed site certificate conditions was November 12, 2021. Idaho Power and the Department timely submitted rebuttal evidence on that date.

On November 17, 2021, limited party STOP B2H filed a Motion to Strike Portions of ODOE Rebuttal to Direct Testimony and Evidence. On November 18, 2021, Ms. Gilbert filed a Motion to Strike Portions of the Department's Rebuttal to Direct Testimony and Evidence and Response to Proposed Site Certificate Conditions.

On November 22, 2021, Ms. Gilbert filed a Motion to Exclude testimony and exhibits offered by Idaho Power in connection with Issues FW-3, FW-6 and LU-11 (Motion to Exclude).

On November 23, 2021, the ALJ issued a *Ruling on STOP B2H Coalition's Motion to Strike Portions of ODOE Rebuttal to Direct Testimony and Evidence*, denying STOP B2H's Motion to Strike. The ALJ accepted the Department's submission as an opening brief/hearing memorandum responsive to legal arguments in the direct testimony and to the limited parties' proposed site certificate conditions.

Also on November 23, 2021, the ALJ issued a *Ruling on Irene Gilbert's Motion to Strike Portions of ODOE Rebuttal to Direct Testimony and Evidence*, denying Ms. Gilbert's Motion to Strike on the same basis.

On November 30, 2021, the ALJ issued a *Ruling on Limited Party Irene Gilbert's Motion to Exclude Idaho Power's Testimony and Exhibits – Witness Jessica Taylor*, denying Ms. Gilbert's Motion to Exclude testimony and exhibits.

Surrebuttal Evidence: The deadline for submitting sur-rebuttal testimony and evidence was December 3, 2021.

On November 22, 2021, limited party Anne March requested that the December 3, 2021 deadline be extended to midnight on Sunday, December 5, 2021. Also on November 22, 2021, limited party Stacia Webster requested adjustments to the filing deadline. Idaho Power objected to the limited parties' requests to extend the surrebuttal deadline. Idaho Power also provided the limited parties with alternate means to access the referenced data files.

On November 24, 2021, the ALJ issued a *Ruling Denying Limited Parties' Requests to Adjust Contested Case Schedule Filing Deadlines*.

On November 22, 2021, Ms. Gilbert requested that her deadline to submit sur-rebuttal evidence and cross-examination requests be extended nine days, to December 12, 2021. On November 23, 2021, Idaho Power objected to Ms. Gilbert's request to extend the sur-rebuttal deadline. On November 24, 2021, the ALJ issued a *Ruling on Limited Party Irene Gilbert's Request to Extend Deadline for Filing Sur-rebuttal and Cross-Examination Requests*, denying the request to extend the deadline.

On November 30, 2021, Ms. Gilbert requested reconsideration of the Ruling denying her request for a deadline extension. On December 1, 2021, the ALJ issued a *Ruling on Limited Party Irene Gilbert's Motion to Reconsider Denial of Request to Extend Deadline for Filing Sur-rebuttal and Cross-Examination Requests* adhering to her November 24, 2021 ruling.

On December 3, 2021, the ALJ received sur-rebuttal evidence from the following limited parties: Cooper (Issue PS-4), Fouty (Issue SP-1), Geer (Issues FW-3 and FW-6), Gilbert (Issues FW-3 and LU-11), March (Issue FW-7), STOP B2H (Issues NC-2, NC-3, NC-4 and SP-1), and Williams (Issue HCA-7).

On December 10, 2021, Idaho Power filed its Objections to Limited Parties' Sur-rebuttal Testimony and Exhibits. Limited parties STOP B2H, Fouty, Geer, Gilbert, March, and Williams filed responses to Idaho Power's objections.

On January 3, 2022, the ALJ issued *Rulings on Idaho Power's Objections to Limited Parties' Surrebuttal Testimony and Exhibits*.

Court Reporter for Cross-Examination Hearing: On December 2, 2021, the ALJ issued an *Acknowledgement of Court Reporter for Cross-Examination Hearing*, approving Idaho Power's request to use Buell Realtime Reporting to produce transcripts of the cross-examination hearing.

Cross-Examination Requests: On December 3, 2021, the ALJ also received requests for cross-examination of witness(es) from the following parties/limited parties:

- Idaho Power, requesting cross-examination of Greg Larkin (Issues NC-2, NC-3, NC-4);¹⁰ Kerri Standlee (Issue NC-2); Isobel Lingenfelter (Issue SR-2); Lois Barry (Issue SR-7).
- Lois Barry, requesting cross-examination of Louise Kling (Issues R-2, R-3, and R-4).
- Gail Carbiener, requesting cross-examination of Louise Kling and Dennis Johnson (Issue SR-2).

¹⁰ On December 15, 2021, Idaho Power withdrew its request to cross-examine Mr. Larkin.

- Matt Cooper, requesting cross-examination of Douglas Dockter, Dennis Johnson and Chris Lautenberger (Issue PS-4).
- Suzanne Fouty, requesting cross-examination of Mark Madison (Issue SP-1).
- Irene Gilbert, requesting cross-examination of Tim Butler and Jessica Taylor (Issues FW-3 and LU-11).
- Anne and Kevin March, requesting cross-examination of Chris James, Greg Apke, Sara Reif, and “an Oregon Department of Energy representative.” (Issue FW-7).
- STOP B2H, requesting cross-examination of Mark Bastasch and Ken Kosky (Issues NC-1, NC-2, NC-3, and NC-4), Mark Madison (Issue SP-1), and Louise Kling (Issue SR-7).

The Department timely objected to the Marches’ request to cross-examine “an Oregon Department of Energy representative,” as no Oregon Department of Energy representative provided testimony on Issue FW-7.

Certified Questions to Council: On December 14, 2021, the ALJ sent *Certified Questions to Council Regarding Interpretation of OAR 345-015-0085(1) and (2)*, asking the Council for guidance in harmonizing apparently conflicting provisions in the procedures governing site certificate contested case proceedings and interpreting OAR 345-015-0085(1) and (2).

On December 23, 2021, the Council notified the ALJ that the Council added the certified questions to the agenda of its regularly scheduled meeting on December 16 and 17, 2021. During the meeting, the Council considered several motions on the questions, but none of the motions passed. By email dated December 23, 2021, the Council notified the ALJ that it declined to provide answers to the certified questions.

Status Conference/Cross-Examination Hearing Schedule: On December 15, 2021, the ALJ convened a status conference, by WebEx, with the parties/limited parties to address the schedule and logistics for the cross-examination hearing. During the conference, the ALJ sustained the Department’s objection to the Marches’ request to cross-examine an Oregon Department of Energy representative.

On December 16, 2021, the ALJ issued a *Notice of Virtual Cross-Examination Hearing; Cross-Examination Hearing Schedule*, providing notice of the Webex hearing set for January 10, 11, 13, 14, 18, and 19, 2022, the schedule for witnesses, and document filing deadlines.

Cross-Examination Hearing: The cross-examination hearing convened via WebEx over the course of seven days, January 10, 11, 13, 14, 18, 19, and 21, 2022. Attorneys Lisa Rackner, Jocelyn Pease, and David Stanish appeared on behalf of Applicant. Assistant Attorney General (AAG) Patrick Rowe appeared on behalf of the Department, with Sarah Esterson, Senior Policy

Advisor and Kellen Tardaewether, Senior Siting Analyst.¹¹ Attorneys Karl Anuta and Mike Sargetakis appeared on behalf of limited party STOP B2H. The following limited parties participated *pro se*: Irene Gilbert, Suzanne Fouty, Matt Cooper, Anne and Kevin March, Gail Carbiener, and Lois Barry.

On January 10, 2022, the following witnesses testified regarding Issues NC-1, NC-2, NC-3 and NC-4: Gage Miller, Golder Associates; Mark Bastasch, Jacobs Consulting; and Kerri G. Standlee, DSA Acoustical Engineers.

On January 11, 2022, Mark Madison of Jacobs Consulting testified regarding Issue SP-1.

On January 13, 2022, the following witnesses testified regarding Issue PS-4: Douglas J. Dockter from Idaho Power and Chris Lautenberger, Reax Engineering.

On January 14, 2022, Jessica Taylor with Tetra Tech testified regarding Issues FW-3 and LU-11. On the Department's request, due to the unavailability of Department witness Tim Butler from the Oregon Department of Agriculture (ODA), the ALJ continued the witness cross-examination on Issues FW-3 and LU-11 to Friday, January 21, 2022.

On January 18, 2022, the following witnesses testified regarding Issue FW-7: Greg Apke, ODFW; Sarah Reif, ODFW; and Chris James, Tetra Tech.

On January 19, 2022, the following witnesses testified regarding Issues R-2, R-3, R-4, SR-2 and SR-7: Dennis Johnson, POWER Engineers; Louise Kling, AECOM; and Isobel Lingenfelter.

On January 21, 2022, Mark Porter with the ODA testified regarding Issues FW-3 and LU-11.¹² The cross-examination hearing concluded on January 21, 2022.

Fourth Case Management Order: On January 25, 2022, following the close of the cross-examination hearing, the ALJ issued the *Fourth Order on Case Management Matters and Contested Case Schedule*, setting the evidentiary record closing date and closing brief schedule.

Cross-Examination Hearing Transcripts and Corrections Thereto: On January 31, 2022, the ALJ admitted the Cross-Examination Hearing Transcripts and the timely corrections/errata sheets submitted thereon into the evidentiary record.

¹¹ Wally Adams from the Department was also present throughout the hearing to provide technical assistance.

¹² Mr. Butler, the manager of the Oregon Department of Agriculture (ODA) Noxious Weed Program, was unavailable to appear and testify at the cross-examination hearing due to a family medical emergency. The Department provided Mr. Porter, ODA's Integrated Noxious Weed Management Specialist for Northeast Oregon, as its ODA expert on noxious weed management. Mr. Porter reports directly to Mr. Butler at ODA. The ALJ overruled Ms. Gilbert's objections to Mr. Porter testifying on behalf of the ODA in Mr. Butler's stead.

Close of Evidentiary Record: The evidentiary record in this matter closed on January 31, 2022.

Table of Admitted Testimony and Exhibits: On February 1, 2022, the ALJ issued a *List of Testimony and Exhibits Admitted into the Contested Case Hearing Record*. The ALJ provided a table of the evidence (in addition to the B2H Project Record) received by the ALJ and admitted into the contested case record as of January 31, 2022, the evidentiary record close date. Also on February 1, 2022, the ALJ issued a *Response to Idaho Power Company's Request for Clarification Regarding Motions for Summary Determination and Supporting Documents*.

On February 4, 2022, in response to requests from Idaho Power and limited party Dr. Fouty, the ALJ issued an *Amended List* including evidence the ALJ inadvertently omitted from the original list.

On February 11, 2022, the ALJ issued a *Response to Dr. Suzanne Fouty's Request for Clarification on Evidentiary Record*.

On February 14, 2022, the ALJ issued a *Second Amended List of Testimony and Exhibits Admitted into the Contested Case Hearing Record*, with corrections to the *Amended List*.

On February 16, 2022, the ALJ issued a *Response to Irene Gilbert's Request to Amend List of Testimony and Exhibits*, denying Ms. Gilbert's request to add five documents not offered during the Hearing phase to the Table of Additional Admitted Evidence. The ALJ upheld her determination in a *Ruling on Gilbert's Request to Rescind Ruling Denying Request to Amend List of Testimony and Exhibits and Response to Idaho Power Company's Request for Clarification* issued February 25, 2022.

Closing Briefs. The deadline for filing written closing briefs was February 28, 2022. The ALJ received closing briefs from the Department, Idaho Power, and the following limited parties: STOP B2H (Issues NC-1, NC-2, NC-3, NC-4, SR-7 and SP-1); Lois Barry (Issues R-2, R-3, and R-4); Carbiener (Issue SR-2); Cooper (Issues PS-4 and SS-2); Deschner (Issue SR-3); Fouty (Issue SP-1); Geer (Issues FW-3 and FW-6); Gilbert (Issues FW-3, FW-5, HCA-6, LU-7, LU-8, LU-11, NC-2, PS-5, and RFA-1); Gray (Issue NC-6); Horst (Issues HCA-4, PS-6, and SS-3); Lyons (Issue PS-10); Mammen (Issue PS-6); March (Issue FW-7); Marlette (Issues HCA-3 and M-6); McAllister (Issue R-2); Myers (Issues LU-9 and NC-2); and Williams (Issue HCA-7).

The ALJ did not receive closing briefs from the following limited parties: Colin Andrew (Issues R-1 and R-3); Kathryn Andrew (Issue R-3); Badger-Jones (Issue PS-1); Peter Barry (Issue R-3); Foss (Issue LU-4); Miller (Issues SR-2, PS-2, and PS-3); S. Webster (Issues HCA-6; SS-1, and PS-10); White (Issue SS-5); and Winters (Issue PS-4).

The filing deadline for filing written response briefs was March 30, 2022. The ALJ received response briefs from the Department, Idaho Power, and the following limited parties: STOP B2H (Issues NC-1, NC-2, NC-3, NC-4, and SR-7); Lois Barry (Issues R-2, R-3, and R-4); Peter Barry (Issue R-3); Carbiener (Issues RFA-2 and SR-2); Cooper (Issue PS-4); Deschner (Issue SR-3); Fouty (Issue SP-1); Geer (Issues FW-3 and FW-6); Gilbert (Issues FW-3, RFA-1,

HCA-3, and NC-2); Gray (Issue NC-6); Horst (Issues HCA-4, NC-2, PS-6, and SS-3); Lyons (Issue PS-10); Marlette (Issues HCA-3 and M-6); McAllister (Issue R-2); Myers (Issues LU-9 and NC-2); and Williams (Issue HCA-7).

Motions to Strike Portions of Limited Parties' Closing Arguments and Response Briefs. As part of several response briefs, Idaho Power also filed motions to strike portions of the limited parties' closing briefs that Idaho Power contended referenced evidence not included in the contested case record and/or that raised arguments outside the scope of the issues for which the limited party had standing. Specifically, Idaho Power moved to strike specific statements in the following briefs: STOP B2H's closing brief; Ms. Barry's closing brief on Issues R-2, R-3, and R-4; Mr. Cooper's closing brief on Issue SS-2; Mr. Deschner's closing brief on Issue SR-3; Dr. Fouty's closing brief on Issue SP-1; Ms. Geer's closing brief on Issue FW-6; Ms. Gilbert's closing briefs on Issues FW-3 and FW-5, LU-7 and LU-8, and NC-2; Mr. Horst's closing brief on Issue PS-6; Mr. Lyons' closing brief on Issue PS-10; the Mammens' closing brief on Issue PS-6; Mr. McAllister's closing brief in Issue R-2; and Mr. Myers' closing briefs on Issues LU-9 and NC-2.

On April 6, 2022, the ALJ issued a Response regarding Motions to Strike, advising the parties and limited parties that she would be addressing and incorporating her rulings on the motions to strike in the Proposed Order on Contested Case. The ALJ also gave the limited parties subject to a motion to strike until April 14, 2022 to file their oppositions to the motions.

On April 7, 2022, Idaho Power filed a Motion to Strike Portions of the Response Briefs Filed by STOP B2H (Issue RFA-2); Irene Gilbert, (Issues FW-3, HCA-3, LU-9); Susan Geer (Issue FW-6), Joe Horst and Anna Cavinato (Issue PS-6), Charles Lyons (Issue PS-10), Lois Barry (Issues R-2, R-3, and R-4); Michael McAllister (Issue R-2); Peter Barry (Issue R-3), Gail Carbiener (Issue RFA-2), and Suzanne Fouty (Issue SP-1).

Also on April 7, 2022, Irene Gilbert filed a Motion to Reopen File for Submission of Evidence and Arguments Responding to Idaho Power's Motions to Strike. On April 14, 2022, the ALJ issued a *Ruling on Irene Gilbert's Motion to Reopen the Record for Submission of Additional Evidence in Response to Motions to Strike*, denying the request to reopen the evidentiary record, but allowing Ms. Gilbert additional time to respond to the Motions to Strike.

The ALJ received responses to Idaho Power's motions to strike from the following limited parties: STOP B2H; Lois Barry; Peter Barry; Cooper; Fouty; Geer; Gilbert; Horst/Cavinato; Lyons; and McAllister.

Other Motions to Strike. In response to Idaho Power's motions, limited parties Peter Barry and Matt Cooper filed their own Motions to Strike. Mr. Barry moved to strike the entirety of Idaho Power's application for site certificate (ASC). Mr. Cooper moved to strike portions of Idaho Power's Response Brief regarding Issue PS-4. These motions are also addressed herein.

BURDEN OF PROOF

ORS 183.450(2) and OAR 345-021-0100(2), together, identify the appropriate allocation

of the burdens applicable to EFSC contested case proceedings on an ASC. Applicant bears the burden of proving that the proposed facility complies with all applicable statutes, administrative rules, and local government ordinances. OAR 345-021-0100(2). The party/limited party raising an issue in this contested case by challenging the Department's Proposed Order bears the burden of producing evidence in support of the facts alleged and/or positions taken on any properly raised issue. ORS 183.450(2). That party/limited party also bears the burden of persuading the trier of fact that the alleged facts are true or the proffered position on the issue is correct. Neither Applicant nor the Department is required to disprove an opposing party/limited party's allegations and argument that Applicant has not met a particular statutory/regulatory requirement or Council siting standard. Rather, the party/limited party asserting a deficiency in the findings and/or conclusions in the Department's Proposed Order on the ASC bears the burden of establishing the claim or alleged facts.

Accordingly, Applicant maintains the burden to show by a preponderance of the evidence in the decision record that the proposed facility complies with the Council's siting standards and other applicable statutes and rules. The Department's Proposed Order, as conditioned, determined that the decision record on the ASC indicates Applicant satisfied the requirements for issuance of the requested site certificate. That determination creates a rebuttable presumption that Applicant has satisfied its burden to show that the proposed facility will, more likely than not, comply with all applicable statutes, administrative rules, and local government ordinances. Thus, with regard to provisions of the Department's Proposed Order not challenged in this contested case, the presumption stands and Applicant is not required to make additional showings at the contested case hearing to meet its initial burden. With regard to those provisions of the Department's Proposed Order challenged through the petitions for party status/requests for contested case hearing, a limited party with standing on a particular issue bears the burden of producing evidence sufficient to establish the claim with regard to that issue (*i.e.*, the alleged deficiency in the Department's Proposed Order) to rebut the presumption created by the Department's Proposed Order. Applicant has no obligation to disprove unsubstantiated claims and/or allegations raised by the limited parties.

ISSUES DISMISSED OR RESOLVED ON SUMMARY DETERMINATION

As set out above in the History of the Case, the ALJ authorized motions for summary determination in this matter. Idaho Power timely filed motions for summary determination seeking a favorable ruling on 34 contested case issues.¹³ The Department filed motions for summary determination seeking a favorable ruling on eight issues, seven of which overlapped with Idaho Power's motions.¹⁴ Between July 14, 2021 and August 17, 2021, the ALJ issued a

¹³ Idaho Power sought summary determination on Issues FW-1, FW-2, FW-9, FW-10, FW-11, FW-12, FW-13, HCA-2, HCA-5, LU-1, LU-2, LU-3, LU-5, LU-6, LU-10, N-1, N-2, N-3, NC-5, R-2, RFA-3, SR-1, SR-4, SR-5, SR-6, SP-2, SS-4, TE-1, and miscellaneous issues M-1, M-2, M-3, M-4, M-5, and M-7. Because limited party EOU withdrew from the contested case in June 2021, the ALJ dismissed Issues FW-2 and LU-1 without ruling on Idaho Power's motions regarding these two issues.

¹⁴ Like Idaho Power, the Department sought summary determination on Issues FW-13, LU-1, N-2, SR-1, SR-4, SP-2, and TE-1. The Department also sought summary determination on Issue FW-4. As noted

series of Rulings and Orders on the motions. Those Rulings and Orders dismissed or resolved the following contested case issues:

Fish and Wildlife Habitat Standard (FW)

Issue FW-1: Whether Applicant adequately analyzed sage grouse habitat connectivity in the Baker and Cow Valley Priority Areas of Conservation (PAC), the potential indirect impacts of the proposed facility on sage grouse leks, and the existing number of sage grouse in the Baker and Cow Valley PACs.

The *Amended Order on Party Status* granted STOP B2H and Louise Squire limited party status with standing on Issue FW-1. In the *Ruling and Order on Motions for Summary Determination of Contested Case Issue FW-1*, issued August 5, 2021, and incorporated herein by this reference, the ALJ dismissed Issue FW-1 from the contested case, and dismissed Ms. Squire as a limited party. The ALJ found that neither STOP B2H nor Ms. Squire presented evidence demonstrating any insufficiencies in Idaho Power's analysis of the proposed facility's potential impacts to sage grouse leks and/or sage grouse habitat connectivity. The ALJ further found that Idaho Power had no obligation to ascertain the existing number of sage grouse in the Baker and Cow Valley PACs to establish the proposed facility's compliance with the Fish and Wildlife Habitat Standard.

Ms. Squire did not appeal the ruling terminating her right to participate in the contested case proceeding and dismissing Issue FW-1. Therefore, the *Ruling and Order on Motions for Summary Determination of Contested Case Issue FW-1*, issued August 5, 2021, is final as to Ms. Squire.¹⁵

Issue FW-4: Whether Applicant is required to evaluate habitat impacts of species listed as threatened or endangered under the Federal Endangered Species Act.

The *Amended Order on Party Status* granted Ms. Gilbert limited party status on Issue FW-4. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue FW-4*, issued August 12, 2021, and incorporated herein by this reference, the ALJ dismissed Issue FW-4 from the contested case. The ALJ found that, as a matter of law, the Council's Fish and Wildlife Habitat standard does not require an applicant for a site certificate to specifically evaluate impacts to federally-listed threatened or endangered species and/or their habitats separate and apart from the general analysis of fish and wildlife habitats located within the analysis area.

above, because EOU withdrew from the case, the ALJ did not rule on the Department's motion on Issue LU-1.

¹⁵ See OAR 345-015-0024(2) (an order permanently excluding a party/limited party from further participation in the contested case proceeding is final unless the party/limited party submits an appeal to the Council within seven calendar days of service of the order); see also OAR 345-015-0057 (authorizing a party excluded from participation in the contested case to submit an interlocutory appeal to the Council "within seven calendar days after the date of the ruling of the hearing officer.")

Issue FW-9: Whether State Sensitive Bat species should be removed from the list of preconstruction surveys required by Fish and Wildlife Condition 16.

Only the Department and Idaho Power have standing on Issue FW-9. In the *Ruling and Order on Idaho Power Company's Motion for Summary Determination on Contested Case Issues FW-9, FW-10, FW-11 and LU-10 (Ruling on Issues FW-9, FW-10, FW-11 and LU-10)*, issued August 17, 2021 and incorporated herein by this reference, the ALJ found that Idaho Power was entitled to a favorable ruling on Issue FW-9.¹⁶ Specifically, the ALJ found:

In Fish and Wildlife Condition 16, "State Sensitive bat species" shall be removed from the list of required surveys. In addition, footnote 373 of the Proposed Order shall be deleted.

Issue FW-10: Whether Department-proposed revisions to Fish and Wildlife Condition 12 should be removed to allow specific protocol surveys to meet survey needs of other species.

Only the Department and Idaho Power have standing on Issue FW-10. In the *Ruling on Issues FW-9, FW-10, FW-11 and LU-10*, the ALJ found that Idaho Power was entitled to a favorable ruling on Issue FW-10 as well. Specifically, the ALJ ruled:

In Fish and Wildlife Condition 12, line 3, the reference to Condition 14 shall be removed. The first sentence shall be corrected to state: "During construction, if active pygmy rabbit colonies or the roost of a State Sensitive bat species is observed during the biological surveys set forth in Fish and Wildlife Conditions 15 and 16, the certificate holder shall submit to the Department for its approval a notification addressing the following: * * * .".

Issue FW-11: Whether Department-proposed revisions to Fish and Wildlife Condition 17 incorrectly assign traffic assumptions to new roads.

Only the Department and Idaho Power have standing on Issue FW-11. In the *Ruling on Issues FW-9, FW-10, FW-11 and LU-10*, the ALJ also found that Idaho Power was entitled to a favorable ruling on Issue FW-11. Specifically, the ALJ ruled:

In Fish and Wildlife Condition 17, paragraph b.iii. shall be corrected to state as follows:

¹⁶ Ms. Gilbert filed an affidavit offering exhibits related to Issue FW-9. Because she does not have standing on Issue FW-9, the ALJ did not consider her affidavit or the exhibits referenced therein in ruling on the Motion on Issue FW-9. See *Ruling on Issues FW-9, FW-10, FW-11 and LU-10* at 1 n.2. Subsequently, on February 28, 2022, Ms. Gilbert filed a Closing Brief regarding Issue FW-9, proposing revisions to Recommended Amended Fish and Wildlife Condition 16, including returning "State Sensitive bat species" to the list of required pre- and post-construction surveys. Ms. Gilbert's proposed revisions to Recommended Amended Fish and Wildlife Condition 16 are addressed *infra* under the heading *Proposed Site Certificate Conditions Unrelated to Identified Issues on Which the Limited Parties Have Standing in the Contested Case*.

iii. The final Sage-Grouse Habitat Mitigation Plan shall include compensatory mitigation sufficient to address impacts from, at a minimum, all facility components except indirect impacts from existing access roads substantially modified for the facility (related or supporting facilities). For calculation purposes, new facility roads with access control will be assigned a “no-traffic” designation, and new roads without access control will be assigned a “low-traffic” designation.

Issue FW-12: Whether Applicant should include in its Fish Passage Plan and be required to replace a culvert on an unnamed stream (referenced as Crossing ID R-37969 in Exhibit BB-2, Table 1) to an appropriate size for fish passage.

The *Amended Order on Party Status* granted Anne March limited party status on Issue FW-12. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue FW-12*, issued August 13, 2021, and incorporated herein by this reference, the ALJ dismissed Issue FW-12 from the contested case. The ALJ found that Idaho Power is not required to prepare a Fish Passage Plan for Crossing R-37969 or replace the existing culvert at that location because Idaho Power did not propose new construction or major replacement of the artificial obstruction at that crossing location.

Issue FW-13: Whether the proposed Morgan Lake Alternative route complies with the Fish and Wildlife Habitat standard.

The *Amended Order on Party Status* granted Michael McAllister limited party status on Issue FW-13. In the *Ruling and Order on Motions for Summary Determination of Contested Case Issues FW-13, R-2, and SP-2*, issued August 3, 2021 and incorporated herein by this reference, the ALJ dismissed Issue FW-13 from the contested case. The ALJ found that Mr. McAllister did not present any evidence demonstrating that the proposed facility is inconsistent with general fish and wildlife habitat mitigation goals and standards along the Morgan Lake Alternative route.

Mr. McAllister took an interlocutory appeal of this ruling.¹⁷ In the *Energy Facility Siting Council Order on Interlocutory Appeal of Administrative Law Judge's Ruling on Motion for Summary Determination for Limited Party McAllister's Issues FW-13, SP-2 and R-2*, issued September 17, 2021, and incorporated herein, the Council affirmed the ALJ's Ruling and dismissed Issue FW-13 from the contested case proceeding.

Historic, Cultural and Archeological Resources Standard (HCA)

Issue HCA-2: Whether the revision of Historic, Cultural and Archeological Resources Condition 1 (mitigation for NRHP-Eligible Oregon Trail/NHT

¹⁷ Mr. McAllister was entitled to take an interlocutory appeal to the Council because the *Ruling and Order on Motions for Summary Determination of Contested Case Issues FW-13, R-2, and SP-2* would have terminated Mr. McAllister's right to participate in the contested case proceeding. OAR 345-015-0057(1).

segments) fails to consider BLM Programmatic Agreement and adds new requirements for mitigation that are inconsistent with the Department's definition of "mitigation" in OAR 345-001-0010(33).

The *Amended Order on Party Status* granted Gail Carbiener and the Oregon California Trail Association limited party status on Issue HCA-2. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issues HCA-2 and HCA-5*, issued August 10, 2021 and incorporated herein by this reference, the ALJ dismissed Issue HCA-2 from the contested case. The ALJ found that there is no Council standard or rule requiring Idaho Power to adhere to the BLM Programmatic Agreement, and the Department acted within its authority under OAR 345-001-0010(33) in recommending a county-level mitigation requirement to the HPMP.

Issue HCA-5: Whether Applicant adequately analyzed the feasibility of undergrounding the transmission line as mitigation for potential visual impacts at Flagstaff Hill/NHOTIC.

The *Amended Order on Party Status* granted Jennifer Miller limited party status on Issue HCA-5. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issues HCA-2 and HCA-5*, issued August 10, 2021 and incorporated herein by this reference, the ALJ dismissed Issue HCA-5 from the contested case. The ALJ found that Idaho Power had no obligation to analyze the feasibility of undergrounding the transmission line and the Department had no authority to evaluate alternative routes or mitigation plans not proposed in the ASC.

Land Use Standard (LU)

Issue LU-2: Whether Applicant erred in calculating the percentage of forestland in Umatilla and Union Counties, thereby underestimating and misrepresenting the amount of potentially impacted forestland.

The *Amended Order on Party Status* granted Kathryn Andrew limited party status on Issue LU-2. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issues LU-2, LU-3, LU-5 and LU-6 (Ruling on Issues LU-2, LU-3, LU-5 and LU-6)*, issued July 21, 2021 and incorporated herein by this reference, the ALJ dismissed Issue LU-2 from the contested case. The ALJ found that although Idaho Power erred in calculating the percentage loss to the forestland base in Umatilla and Union Counties, the math errors were not material to Idaho Power's Goal 4 analysis and the proposed project's compliance with the Land Use Standard.

Issue LU-3: Whether Applicant's analysis of forestland impacts failed to consider all lands defined as Forest Land under state law, thereby misrepresenting forest land acreage.

The *Amended Order on Party Status* also granted Ms. Andrew limited party status on Issue LU-3. In the *Ruling on Issues LU-2, LU-3, LU-5 and LU-6*, the ALJ dismissed Issue LU-3 from the contested case. The ALJ found that Idaho Power properly identified all forestland in the project area for purposes of its Goal 4 analysis and compliance with the Land Use Standard.

Issue LU-5: Whether calculation of forestlands must be based on soil class or whether it is sufficient to consider acreage where forest is predominant use.

The *Amended Order on Party Status* granted Irene Gilbert limited party status on Issue LU-5. In the *Ruling on Issues LU-2, LU-3, LU-5 and LU-6*, the ALJ dismissed Issue LU-5 from the contested case. The ALJ found that, in accordance with the Union County Zoning, Partition, and Subdivision Ordinance (UCZPSO), Idaho Power properly used SSURGO soil classification data in determining the predominant use of hybrid-zoned land in Union County.

Issue LU-6: Whether the alternatives analysis under ORS 215.275 included all relevant farmland.

The *Amended Order on Party Status* also granted Ms. Gilbert limited party status with standing on Issue LU-6. In the *Ruling on Issues LU-2, LU-3, LU-5 and LU-6*, the ALJ dismissed Issue LU-6 from the contested case. The ALJ found that Idaho Power's analysis under ORS 215.275 of the need to site the facility on EFU-zoned land included all relevant farmland.

Issue LU-10: Whether the Department-proposed revisions to the Proposed Order requiring landowner consultation pursuant to ORS 215.276 are unnecessarily specific as to high-value farmland owners.

Only the Department and Idaho Power have standing on Issue LU-10. In the *Ruling on Issues FW-9, FW-10, FW-11 and LU-10*, the ALJ found that Idaho Power was entitled to a favorable ruling on Issue LU-10. Specifically, the ALJ ruled:

With regard the Land Use standard, the pertinent language in Section 7.2 (General Provisions) of Attachment K-1, Agricultural Lands Assessment, shall be revised as follows:

- Prior to construction, IPC shall provide notification to the record owner of any land within the site boundary, of the opportunity to consult with IPC for the purpose of locating and constructing the transmission line in a manner that minimizes impacts to farming operations or other operations of land uses for non-agricultural lands.
 - The initial notification to the record owner shall allow two weeks to respond to the opportunity to consult with IPC. If the record owner does not respond to IPC within two weeks of the initial notification, IPC shall provide a second notification of the opportunity to consult with IPC via certified mail. If the record owner does not respond within two weeks of the second notification, IPC will have satisfied its obligation to consult pursuant to ORS 215.276(2).

- IPC shall establish the notification list using georeferenced maps containing property owner tax lot information, obtained from the most recent county tax assessor roll.
- IPC shall maintain the georeferenced map and notification list, including a list of record owners that completed consultation and record owners that failed to respond.

Need Standard (N)

Issue N-1: Whether the Department erred in defining capacity in terms of kilovolts instead of megawatts.

The *Amended Order on Party Status* granted STOP B2H limited party status on Issue N-1. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issues N-1, N-2, and N-3 (Ruling on Issues N-1, N-2 and N-3)*, issued July 29, 2021 and incorporated herein by this reference, the ALJ dismissed Issue N-1 from the contested case. The ALJ found that the Department did not err in defining capacity in terms of kilovolts for purposes of evaluating the need for the B2H Project under the Least-Cost Plan Rule.

Issue N-2: Whether in evaluating capacity, the Department applied balancing considerations in contravention of OAR 345-022-0000(3)(d).

The *Amended Order on Party Status* also granted STOP B2H limited party status on Issue N-2. In the *Ruling on Issues N-1, N-2, and N-3*, the ALJ dismissed Issue N-2 from the contested case. The ALJ found that the Department concluded Idaho Power demonstrated the need for the facility under the Least-Cost Plan Rule, OAR 345-023-0020(2), and did not apply balancing considerations to the Need Standard in contravention of OAR 345-022-0000(3)(d).

Issue N-3: Whether Applicant demonstrated need for the proposed facility when Applicant only showed that its needs represent 21 percent of the total capacity.

The *Amended Order on Party Status* also granted STOP B2H limited party status on Issue N-3. In the *Ruling on Issues N-1, N-2, and N-3*, the ALJ dismissed Issue N-3 from the contested case. The ALJ found that Idaho Power demonstrated the need for the proposed facility under the Least-Cost Plan Rule in accordance with OAR 345-023-0005(1) and OAR 345-023-0020(2).

Noise Control Regulations (NC)

Issue NC-5: Whether the revisions in the Proposed Order, Section IV.Q.1, Noise Control Regulation (Methods and Assumptions for Corona Noise Analysis) are inaccurate, specifically the use of the 12:00 a.m. to 5:00 a.m. timeframe to establish ambient noise levels.

The *Amended Order on Party Status* granted Ms. Gilbert limited party status on Issue NC-5. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue NC-5*, issued August 9, 2021 and incorporated herein by this reference, the ALJ dismissed Issue NC-5 from the contested case. The ALJ found that neither Idaho Power nor the Department limited its analysis of potential noise exceedances to the 12:00 a.m. to 5:00 a.m. timeframe. Rather, the potential noise exceedance analysis was based on data from all hours of the day, throughout the entire year.

Retirement and Financial Assurance Standard (RFA)

Issue RFA-3: Whether Applicant has satisfied the Retirement and Financial Assurance standard, whether the financial assurances in the Proposed Order adequately address the risk of stranded assets, and whether Council must evaluate the ability of other project partners to meet financial assurance and retirement cost requirements.

The *Amended Order on Party Status* granted Charles Gillis limited party status on Issue RFA-3. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue RFA-3*, issued July 20, 2021 and incorporated herein by this reference, the ALJ dismissed Issue RFA-3 from the contested case and dismissed Mr. Gillis as a limited party. The ALJ found that Idaho Power satisfied the Retirement and Financial Assurance Standard, that the financial assurances in the Proposed Order adequately address the risk of stranded assets, and that and the Council is not required to consider the ability of other project partners to meet financial assurance and retirement cost requirements.

Mr. Gillis did not appeal the ruling terminating his right to participate in the contested case proceeding and dismissing Issue RFA-3. Therefore, the *Ruling and Order on Motion for Summary Determination of Contested Case Issue RFA-3* issued July 20, 2021 is final.¹⁸

Scenic Resources Standard/Protected Areas Standard (SR)

Issue SR-1: Whether Applicant was required to evaluate impacts to Morgan Lake Park under the Scenic Resources standard because it is recognized as a scenic resource in a local plan (Morgan Lake Recreational Use and Development Plan).

The *Amended Order on Party Status* granted Lois Barry limited party status on Issue SR-1. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue SR-1*, issued July 14, 2021 and incorporated herein by this reference, the ALJ dismissed issue SR-1 from the contested case. The ALJ found that Idaho Power was not required to evaluate impacts to Morgan Lake Park under the Scenic Resources standard because no local land use plan identified Morgan Lake Park as a significant or important scenic resource.

Issue SR-4: Whether Applicant should have evaluated Union County as an important scenic resource under the Scenic Resources standard and, if so, whether

¹⁸ See OAR 345-015-0024(2) and OAR 345-015-0057(2).

the Department erred in concluding that the proposed facility is not likely to result in significant adverse impact to this scenic resource.

The *Amended Order on Party Status* granted David Moyal and Daniel White limited party status on Issue SR-4. In the *Rulings and Order on Motions for Summary Determination of Contested Case Issue SR-4, Limited Parties David Moyal and Daniel White*, issued July 14, 2021 and incorporated herein by this reference, the ALJ dismissed Issue SR-4 and limited parties David Moyal and Daniel White from the contested case. The ALJ found that Idaho Power had no obligation to evaluate Union County as a significant or important scenic resource in the ASC and the Department did not err in omitting an evaluation of Union County as a significant or important scenic resource under the Scenic Resources standard.

Neither Mr. Moyal nor Mr. White appealed this ruling dismissing Issue SR-4 and terminating their right to participate in the contested case proceeding. Therefore, the *Rulings and Order on Motions for Summary Determination of Contested Case Issue SR-4, Limited Parties David Moyal and Daniel White*, is final.¹⁹

Issue SR-5: Whether the Rice Glass Hill Natural Area should be evaluated as a Protected Area.

The *Amended Order on Party Status* granted Susan Geer limited party status on Issue SR-5. In the *Ruling and Order on Motion for Summary Determination on Contested Case Issue SR-5*, issued July 21, 2021 and incorporated herein by this reference, the ALJ dismissed Issue SR-5 from the contested case. The ALJ found that because the Rice Glass Hill Natural Area was not registered as a Natural Area as of May 11, 2007, Idaho Power had no obligation to evaluate the Rice Glass Hill Natural Area as a Protected Area in ASC Exhibit L.

Issue SR-6: Whether Applicant's visual impact assessments are invalid because Applicant did not incorporate Oregonians' subjective evaluation of their resources to evaluated visual impacts, thereby invalidating the visual impact analysis for Morgan Lake Park and other protected areas, scenic resources and important recreational opportunities.

The *Amended Order on Party Status* granted STOP B2H and Lois Barry limited party status on Issue SR-6. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue SR-6*, issued July 26, 2021 and incorporated herein by this reference, the ALJ dismissed Issue SR-6 from the contested case. The ALJ found Idaho Power's visual impact assessments are valid. In addition, the ALJ found that Idaho Power had no obligation under the Council's siting standards to incorporate Oregonians' subjective evaluations of the resource and that Idaho Power's visual impact methodology accounted for viewer subjective evaluations by assuming that all identified visual resources were highly sensitive to impacts.

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¹⁹ See OAR 345-015-0024(2) and OAR 345-015-0057(2).

Soil Protection Standard (SP)

Issue SP-2: Whether the proposed Morgan Lake Alternative complies with the Soil Protection standard.

The *Amended Order on Party Status* granted Mr. McAllister limited party status with standing on Issue SP-2. In the *Ruling and Order on Motions for Summary Determination of Contested Case Issues FW-13, R-2, and SP-2*, issued August 3, 2021 and incorporated herein by this reference, the ALJ dismissed Issue SP-2 from the contested case. The ALJ found that Mr. McAllister did not present any evidence demonstrating that the proposed facility will result in significant adverse impacts to soils in the analysis area along the Morgan Lake Alternative route.

Mr. McAllister took an interlocutory appeal of this ruling. In the *Energy Facility Siting Council Order on Interlocutory Appeal of Administrative Law Judge's Ruling on Motion for Summary Determination for Limited Party McAllister's Issues FW-13, SP-2 and R-2*, issued September 17, 2021, and incorporated herein, the Council affirmed the ALJ's Ruling and dismissed Issue SP-2 from the contested case proceeding.

Structural Standard (SS)

Issue SS-4: Whether Applicant should remove the Hawthorne Loop as a construction access route due to the steep grade and the potential landslide risks if modifications are needed to support construction-related traffic.

The *Amended Order on Party Status* granted Dale and Virginia Mammen limited party status on Issue SS-4. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue SS-4*, issued July 23, 2021 and incorporated herein by this reference, the ALJ dismissed Issue SS-4 from the contested case. The ALJ found that Idaho Power did not propose the Hawthorne Loop as a "related or supporting facility" within the site boundary and did not propose modifications to the Hawthorne Loop as a construction access route, and that the Council lacks jurisdiction to consider and review roads that Idaho Power did not propose as related or supporting facilities.

Threatened and Endangered Species Standard (TE)

Issue TE-1: Whether Applicant was required to have an Oregon Department of Agriculture botanist review the ASC.

The *Amended Order on Party Status* granted Susan Geer limited party status on Issue TE-1. In the *Ruling and Order on Motions for Summary Determination of Contested Case Issue TE-1*, issued July 20, 2021 and incorporated herein by this reference, the ALJ dismissed Issue TE-1 from the contested case. The ALJ found that Idaho Power was not obligated to have an Oregon Department of Agriculture botanist review the ASC, and that the Council (through the Department) properly consulted with the ODA in evaluating the proposed project's compliance with the Threatened and Endangered Species standard as required by OAR 345-022-0070.

General Standard - Miscellaneous Issues (M)

Issue M-1: Site Boundary: Whether, due to substantial modifications likely necessary but not proposed, Applicant should be required to amend the site boundary to include Morgan Lake Road (La Grande, Union County) and, if so, whether the Department should provide notice and the opportunity to comment to potentially affected landowners.

The *Amended Order on Party Status* granted Susan Badger-Jones limited party status with standing on Issue M-1. In the *Ruling and Order on Motion for Summary Determination on Contested Case Issues M-1, M-2, M-3, M-4, and M-5 (Ruling on Issues M-1, M-2, M-3, M-4, and M-5)*, issued July 14, 2021, and incorporated herein by this reference, the ALJ dismissed issue M-1 from the contested case. The ALJ found that the Council lacks jurisdiction to require Idaho Power to amend the site boundary to something other than what Idaho Power proposed in the ASC.

Issue M-2: Site Boundary: Whether Applicant failed to include roads and other areas of use and potential modification from the site boundary thereby prohibiting affected landowners in the proximity of these areas from the opportunity to request a contested case during the ASC process.

The *Amended Order on Party Status* granted Ms. Gilbert standing on Issue M-2. In the *Ruling on Issues M-1, M-2, M-3, M-4, and M-5*, the ALJ dismissed issue M-2 from the contested case. The ALJ found that the Council lacks the authority to evaluate routes and structures that Idaho Power did not propose in its ASC.

Issue M-3: Whether the maps provided in ASC Exhibit F, Maps 50 and 51, fail to comply with OAR 345-021-0010(1)(c)(A) because they do not name major roads or use an appropriate scale; whether Council can issue a site certificate when the proposed facility site boundary does not accurately identify access roads in Union County as related or supporting facilities.

The *Amended Order on Party Status* granted Matt Cooper standing on Issue M-3. In the *Ruling on Issues M-1, M-2, M-3, M-4, and M-5*, the ALJ dismissed issue M-3 from the contested case. The ALJ found that Idaho Power was not required to label major roads or use a particular scale on the notification maps submitted as part of ASC Exhibit F. In addition, the ALJ found the Council did not have jurisdiction to review or evaluate roads not included in the ASC as related or supporting facilities.

Issue M-4: Whether the maps provided in ASC Exhibit B, Road Classification Guide and Access Control, fail to comply with OAR 345-021-0010(1)(c)(A) because they do not include road names or use an appropriate scale; whether Council can issue a site certificate when the maps provided in the ASC are incomplete and do not accurately identify access roads in Union County as related or supporting facilities.

The *Amended Order on Party Status* granted Jane and Jim Howell standing on Issue M-4. In the *Ruling on Issues M-1, M-2, M-3, M-4, and M-5*, the ALJ dismissed Issue M-4 from the contested case. The ALJ found that the Council lacks jurisdiction to review or evaluate roads not included in the ASC as related or supporting facilities.

On August 3, 2021, after the ALJ dismissed Issue M-4, the Howells withdrew as limited parties from the contested case.

Issue M-5: Whether the maps provided in the ASC were sufficient to give notice of potential impacts from the proposed facility.

The Howells also had standing as limited parties on Issue M-5. In the *Ruling on Issues M-1, M-2, M-3, M-4, and M-5*, the ALJ dismissed issue M-5 from the contested case. The ALJ found, among other things, that the maps provided in the ASC are in compliance with the Council's requirements and there is a Council rule requiring that the maps in the ASC suffice to "give notice of potential impacts" from the proposed facility.

On August 3, 2021, after the ALJ dismissed Issue M-5, the Howells withdrew as limited parties from the contested case.

Issue M-7: Notice: Whether Mr. Proesch received adequate notice regarding the proposed transmission line.

The *Amended Order on Party Status* granted Tim Proesch limited party status with standing on Issue M-7. In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue M-7*, issued July 14, 2021 and incorporated herein by this reference, the ALJ dismissed issue M-7 from the contested case and dismissed Mr. Proesch as a limited party. In the *Ruling*, the ALJ found that Mr. Proesch had no recorded ownership interest in property in the immediate vicinity of the proposed facility and therefore neither Idaho Power nor the Department had any obligation to send him written notice of the proposed project.

Mr. Proesch did not appeal the ruling dismissing Issue M-7 and terminating his right to participate in the contested case proceeding. Therefore, the *Ruling and Order on Motion for Summary Determination of Contested Case Issue M-7*, is final.²⁰

Attached to this Proposed Order as Appendix 2 is a **Table of Exhibits Admitted – Summary Determination Phase**, that sets out, by issue, the affidavits and supporting documents submitted in support of, and opposition to, the motions for summary determination.

REMAINING ISSUES FOR THE CONTESTED CASE HEARING

Fish and Wildlife Habitat Standard

Issue FW-3: Whether the Draft Noxious Weed Plan (Proposed Order Attachment

²⁰ See OAR 345-015-0024(2) and OAR 345-015-0057(2).

P1-5) adequately ensures compliance with the weed control laws, ORS 569.390, ORS 569.400, and ORS 569.445.

Issue FW-5: Whether Applicant should be required to mitigate impacts to riparian areas from the setback location to the outer edges of the riparian area because the riparian habitat should be rated as Category 2 at a minimum.

Issue FW-6: Whether the Noxious Weed Plan provides adequate mitigation for potential loss of habitat due to noxious weeds when it appears to relieve Applicant of weed monitoring and control responsibilities after five years and allows for compensatory mitigation if weed control is unsuccessful.

Issue FW-7: Whether Applicant's Fish Passage Plans, including 3A and 3B designs, complies with the Fish and Wildlife Habitat standard's Category 2 mitigation requirements; whether Applicant must revisit its plans because threatened Steelhead redds have been identified in the watershed.

Historic, Cultural and Archeological Resources (HCA) Standard

Issue HCA-3: Whether Historic, Cultural and Archeological Resources Condition [2]²¹ (HPMP) related to mitigation for crossings of Oregon Trail resources provides adequate mitigation for visual impacts and sufficient detail to allow for public participation.

Issue HCA-4: Whether National Historical Oregon Trail segments with ruts located on Mr. Horst's property (Hawthorne Drive, La Grande) can be adequately protected from adverse impacts from the proposed facility.

Issue HCA-6: Whether, as part of the HPMP (Historic, Cultural and Archeological Resources Condition 2)²², Applicant should be required to have an Oregon Trail expert, recommended by OCTA and agreed to by the Field Director, added to the Cultural Resource Team and present during preconstruction surveys to adequately identify emigrant trail locations.

Issue HCA-7: Whether Applicant adequately evaluated archeological resource "Site 6B2H-MC-10" on Mr. Williams' property, Parcel 03S37E01300.

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²¹ This issue statement has been amended to refer to the correct condition number. Recommended HCA Condition 2 imposes requirements related to the HPMP. See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 513 of 10016. Recommended HCA Condition 1 requires that the facility components avoid direct impacts to Oregon Trail/NHT resources. *Id.* at page 474 of 10016,

²² See footnote above.

Land Use Standard

Issue LU-4: The adequacy of the analysis of potential impacts of transmission line interference with GPS units on irrigation system.

Issue LU-7: Whether the evaluation of the proposed facility impacts to the cost of forest practices accurately determined the total acres of lost production or indirect costs.

Issue LU-8: The adequacy of Applicant's evaluation of the proposed facility impacts to the cost of forest management practices and whether mitigation must be provided for the entire length of the transmission line for the operational lifetime.

Issue LU-9: Whether Applicant adequately analyzed the risk of wildfires from operation of the proposed transmission lines, especially during "red flag" warning weather conditions, and the impact the proposed transmission lines will have on Mr. Myers' ability to use an aerial applicator on his farmland.

Issue LU-11: Whether the impacts from the proposed facility on accepted farm practices and the cost of accepted farm practices have been adequately evaluated or mitigated.

Noise Control Rules

Issue NC-1: Whether the Department improperly modified/reduced the noise analysis area in Exhibit X from one mile of the proposed site boundary to ½ mile of the proposed site boundary and whether OAR 345-021-0010(1)(x)(E) requires notification to all owners of noise sensitive property within one mile of the site boundary.

Issue NC-2: Whether the Department erred in recommending that the Council grant a variance/exception from the Oregon DEQ's Noise Rules, OAR 340-035-0035, and whether the variance/exception is inconsistent with ORS 467.010.

Issue NC-3: Whether the methodologies used for the noise analysis to evaluate compliance with OAR 340-035-0035 were appropriate and whether the ODOE erred in approving the methodology used to evaluate compliance with OAR 340-035-0035.

Issue NC-4: Whether the mitigation/proposed site conditions adequately protect the public health, safety and welfare.

Issue NC-6: Whether Applicant's methodology to assess baseline noise levels (described in the Proposed Order at pp. 635-638) reflect reasonable baseline noise estimates for residents of the Morgan Lake area.

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Public Services Standard

Issue PS-1: Traffic Safety: Whether Applicant was required to evaluate traffic safety impacts from construction-related use of Morgan Lake Road.

Issue PS-2: Fire Protection: Whether the site certificate should require that the public have the opportunity to review and comment on the final Wildfire Mitigation Plan; whether the Wildfire Mitigation Plan should include remote cameras to detect wildfire, safety procedures during red flag conditions, and the requirement that firefighting equipment be present on-site during construction.

Issue PS-3: Fire Protection: Whether the Council's reliance on the Wildfire Mitigation Plan (Public Services Condition 7) prepared by Applicant for the Oregon Public Utility Commission (OPUC) is adequate to address wildfire response consistent with the Public Services standard.

Issue PS-4: Fire Protection: Whether Applicant adequately analyzed the risk of wildfire arising out of operation of the proposed facility and the ability of local firefighting service providers to respond to fires.

Issue PS-5: Whether the Wildfire Mitigation Plan is adequately developed and includes sufficient detail to allow for public participation.

Issue PS-6: Traffic Safety: Whether Applicant adequately evaluated the potential traffic impacts and modifications needed on Hawthorne Drive and Modelaire Drive (Hawthorne Loop).²³

Issue PS-8: Whether Department-proposed revisions to Public Services Condition 7 are redundant with Attachment U-3 and existing condition requirements.

Issue PS-9: Whether Department-proposed revisions to the Fire Prevention and Suppression Plan (Public Services Condition 6, Proposed Order Attachment U-3) incorrectly reference applicability to facility operations.

Issue PS-10: Whether the Draft Fire Suppression Plan (Attachment U-3) is adequate and whether local service providers would be able to respond to a facility-related fire.

Recreation Standard (R)

Issue R-1: Whether Applicant adequately evaluated the potential adverse impact

²³ Although this issue, as written, references "the Hawthorne Loop," the limited parties also challenge Idaho Power's evaluation of traffic impacts on the unpaved, privately owned portion of Hawthorne Drive. This latter portion of existing road is included within the site boundary as a related or supporting facility. See ODOE - B2HAPPDoc3-4 ASC 03_ Exhibit C_ Project_Location_ASC 2018-09-28, page 94 of 193.

of the proposed facility on recreational opportunities at Morgan Lake Park.

Issue R-2: Whether the visual impacts of the proposed facility structures in the viewshed of Morgan Lake Park are inconsistent with the objectives of the Morgan Lake Park Recreational Use and Development Plan and should therefore be reevaluated.

Issue R-3: Whether the mitigation proposed to minimize the visual impacts of the proposed facility structures at Morgan Lake Park (\$100,000 for recreational facility improvements) is insufficient because the park's remote areas will not benefit from the proposed mitigation.

Issue R-4: Whether Applicant's visual impact assessment for Morgan Lake Park adequately evaluates visual impacts to the more than 160 acres of undeveloped park land and natural surroundings, as visual simulations were only provided for high-use areas.

Retirement and Financial Assurance Standard (RFA)

Issue RFA-1: Whether the \$1 bond amount adequately protects the public from facility abandonment and provides a basis for the estimated useful life of the facility.

Issue RFA-2: Whether, in the event of retirement of the proposed transmission line, removal of concrete footings to a depth of one foot below the surface is sufficient to restore the site to a useful, nonhazardous condition.

Scenic Resources Standard (SR)

Issue SR-2: Whether Applicant satisfied the Scenic Resources and Protected Area standards at Flagstaff Hill/ NHOTIC and whether Applicant adequately analyzed the feasibility of undergrounding the transmission line as mitigation for potential visual impacts.

Issue SR-3: Whether Applicant adequately assessed the visual impact of the proposed project in the vicinity of the NHOTIC and properly determined the impact would be "less than significant."

Issue SR-7: Whether the methods used to determine the extent of an adverse impact of the proposed facility on scenic resources, protected area and recreation along the Oregon Trail were flawed and developed without peer review and/or public input. Specifically, whether Applicant erred in applying numeric values to the adverse impact and whether Applicant used unsatisfactory measurement locations/observation points in its visual impact assessment.

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Soil Protection Standard (SP)

Issue SP-1: Whether the Soil Protection Standard and General Standard of Review require an evaluation of soil compaction, loss of soil structure and infiltration, and loss of stored carbon in the soil and loss of soil productivity as a result of the release of stored carbon in soils.

Structural Standard (SS)

Issue SS-1: Whether Design Feature 32 of the Proposed Order Attachment G-5 (Draft Framework Blasting Plan) should be a site certificate condition to ensure repair of landowner springs from damage caused by blasting.

Issue SS-2: Whether Applicant adequately analyzed the risk of flooding in areas adjacent to the proposed transmission line arising out of the construction-related blasting. Whether Applicant should be required to evaluate hydrology, including more detailed and accurate mapping of existing creeks and ditches that drain into streets and private property, and core samples of sufficient variety and depth to determine the flooding risk to neighborhoods of south and west La Grande.

Issue SS-3: Whether Applicant should be required to test the water quality of private water wells to ensure that construction-related activities are not impacting water quality and quantity.

Issue SS-5: Whether Applicant has adequately evaluated construction-related blasting in Union County, City of La Grande, under the Structural Standard. Specifically, whether Applicant should be required to conduct site-specific geotechnical surveys to characterize risks from slope instability.²⁴

Miscellaneous Issue

Issue M-6: Whether the Proposed Order fails to provide for a public review of final monitoring plans, fails to provide long-term hazardous materials monitoring, and improperly allows exceptions that substantially increase the likelihood of a hazardous material spill in violation of OAR 345-021-0010(w).

LIMITED PARTIES AND ISSUES WITH STANDING

For the reader's convenience, the following table lists the remaining limited parties in this matter and the remaining issues on which each limited party has standing in the contested case hearing:

²⁴ As set out in the *Case Management Order*, Issue SS-5 also raised a concern about "radon emissions." *Case Management Order* at 8. However, in his hearing testimony, Mr. White focused only on slope instability. He did not offer evidence or argument regarding radon emissions. Because Mr. White did not pursue his concern about radon emissions, the ALJ considers it waived. Issue SS-5 is therefore limited to the statement above.

STOP B2H Coalition	NC-1, NC-2, NC-3, NC-4, SR-7, and SP-1
Andrew, Colin	R-1, R-3
Andrew, Kathryn	R-3
Badger-Jones	PS-1
Barry, Lois	R-2, R-3, and R-4
Barry, Peter	R-3
Carbiener, Gail/OCTA	PS-2, PS-3, RFA-1, RFA-2, and SR-2
Cooper, Matt	NC-1, PS-4, and SS-2
Deschner, Whit	SR-3
Foss, Jim and Kay	LU-4
Fouty, Suzanne	SP-1
Geer, Susan	FW-3 and FW-6
Gilbert, Irene	FW-3, FW-5, HCA-3, LU-7, LU-8, LU-11, NC-2, PS-5, R-3, and RFA-1
Gray, Dianne	NC-2 and NC-6
Horst, Joe/Cavinato, Anna	HCA-4, NC-2, PS-6 and SS-3
Lyons, Charles	PS-10
Mammen, Dale and Virginia	PS-6
March, Anne	FW-7
March, Kevin	FW-7
Marlette, JoAnne	M-6 and HCA-3
McAllister, Michael	R-2
Miller, Jennifer	SR-2, PS-2, and PS-3
Myers, Sam	LU-9 and NC-2
Webster, Stacia	HCA-6, SS-1, and PS-10
White, Jonathan	SS-5
Williams, John	HCA-7
Winters, John	PS-4

EVIDENTIARY RULINGS

As discussed above, on May 26, 2021, the ALJ admitted the entirety of the Decision-Making and Administrative Project Record for the Boardman to Hemingway Transmission Line (the B2H Project Record) into the contested case hearing record.

In addition, during the hearing phase of the contested case, the parties and limited parties in this matter filed written direct testimony and exhibits; rebuttal testimony and exhibits; surrebuttal testimony and exhibits; sur-surrebuttal testimony and exhibits; and cross-examination hearing exhibits. The **Table of Additional Admitted Evidence**, attached hereto as Appendix 1, sets out, by identified issue, the additional evidence (testimony and exhibits) admitted into the evidentiary record during the hearing phase of this matter.

The limited parties with standing on Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1 or SS-2 did not timely submit direct testimony and/or supplemental exhibits on these

nine issues.²⁵ In the *Ruling on Idaho Power Company's Motion to Dismiss Issues FW-5, HCA-6, LU-4, LU-7, LU-8, PS-1, PS-5, SS-1 and SS-2 (Motion to Dismiss Ruling)*, issued November 2, 2021, the ALJ found that by failing to present any written direct testimony and supporting exhibits by the September 17, 2021 deadline, the limited parties waived their opportunity to present any testimony or new evidence in support of their claim(s) on these issues.

In the *Rulings on Objections to Direct Testimony and Exhibits*, issued October 15, 2021, the ALJ sustained the objections of the Department and/or Idaho Power and excluded the following documents (listed by issue) from the evidentiary record:

Issue M-6: Michael Blank testimony summary.
Issue FW-3: Geer Exhibits 1, 2, 4, and 5.
Issue FW-6: Geer Exhibits 1, 2, 4, and 5.
Issue HCA-3: Marlette Witness List with witness summaries; Marlette Exhibits 6 and 7.
Issue LU-11: Unmarked Gilbert Exhibit (Myers Testimony; Issue LU-9).
Issue NC-2: STOP B2H Exhibits 7, 8, and 9; Gilbert Exhibits 5 and 10; Ritchie statement.
Issue PS-4: Cooper Exhibits 15 and 26.
Issue PS-6: Mammen Exhibit 5; Horst/Cavinato Exhibit K.
Issue PS-10: Webster Witness List; Webster Exhibit 35; Lyons Exhibits 10 and 11.
Issue SR-7: STOP B2H Exhibit 15.

In the *Rulings on Idaho Power's Objections to Limited Parties' Surrebuttal Testimony and Exhibits*, issued January 3, 2022, the ALJ sustained Idaho Power's objections and excluded the following evidence:

Issue FW-6: Geer Surrebuttal Exhibit 5S
Issue FW-7: March Surrebuttal Exhibit D.
Issue HCA-7: Williams Surrebuttal testimony (second bullet point only).

In a *Response to Irene Gilbert's Request to Amend List of Testimony and Exhibits* issued February 16, 2022, the ALJ denied Ms. Gilbert's request to add five exhibits to Contested Case Issues LU-7, LU-8 and LU-11 in the Table of Additional Admitted Evidence.²⁶ The ALJ declined to amend the Table of Additional Admitted Evidence because Ms. Gilbert did not offer these documents in support of her position(s) on Issues LU-7, LU-8 and LU-11. The ALJ upheld this determination in a *Ruling on Gilbert's Request to Rescind Ruling Denying Request to Amend List of Testimony and Exhibits and Response to Idaho Power Company's Request for*

²⁵ Ms. Gilbert has standing on Issues FW-5, LU-7, LU-8, and PS-5. Stacia Webster has standing on Issues HCA-6 and SS-1. Jim and Kaye Foss have standing on Issue LU-4. Susan Badger-Jones has standing on Issue PS-1, and Matt Cooper has standing on Issue SS-2.

²⁶ Ms. Gilbert requested to add the Scott Hartell deposition transcript and four Land Use Board of Appeals (LUBA) decisions to Issues LU-7, LU-8, and LU-11.

Clarification issued February 25, 2022.²⁷

In a *Ruling on Irene Gilbert's Motion to Reopen the Record for Submission of Additional Evidence in Response to Motions to Strike* issued April 14, 2022, the ALJ denied Ms. Gilbert's request to reopen the evidentiary record based on a lack of good cause to do so.

FINDINGS OF FACT

Overview: the Applicant, the proposed facility and the project history

1. The applicant for the site certificate at issue herein is Idaho Power Company (Idaho Power). Idaho Power is a wholly owned subsidiary of IDACORP, Inc., incorporated in 1915. Its core business is the generation, transmission, distribution, sale, and purchase of electric energy. Idaho Power serves more than 530,000 customers within a service territory of approximately 24,000 miles in southern Idaho and eastern Oregon. Its power supply system currently includes 4,868 miles of transmission lines, including 692 miles in Oregon. The Company also operates 305 transmission and other stations, and operates and maintains 27,072 miles of distribution lines, 2,212 miles of which are located in Oregon. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 68 of 10016.)

2. The proposed facility, including four alternative route segments, is an approximately 300 mile-long, 500-kilovolt (kV) electric transmission line, plus supporting facilities including access roads and other facility components. The proposed and alternative routes for the facility extend from a switching station to be built near Boardman, Oregon, to the existing Hemingway Substation in Owyhee County, Idaho. The proposed and alternative routes cross five counties in Oregon (Morrow, Umatilla, Union, Baker, and Malheur) and Owyhee County in Idaho. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8 of 10016.)

3. Because the proposed facility also crosses land managed by the Bureau of Land Management (BLM), the Bureau of Reclamation (BOR), the Department of Defense/United States Army Corps of Engineers (USACE), and the United States Forest Service (USFS), the proposed facility is also subject to the permitting process of these federal agencies. (Ranzetta Rebuttal Test. at 12; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8 of 10016.)

4. On July 10, 2010, the Department received a Notice of Intent (NOI) from Idaho Power stating the Company's intent to file an ASC for the proposed Boardman to Hemingway transmission line. On July 16, 2010, the Department issued a public notice of the NOI to the Council's mailing lists and to adjacent property owners as defined in OAR 345-020-0011(1)(f). The Department distributed this public notice jointly with the BLM, the lead agency overseeing the National Environmental Policy Act (NEPA) federal review process, to satisfy both Council and NEPA requirements. The Department also published the notice in multiple local area newspapers within the vicinity of the proposed facility announcing a series of public scoping

²⁷ Because Ms. Gilbert and Ms. Andrew submitted the Hartell deposition transcript with their oppositions to Idaho Power's Motion for Summary Determination on Issues LU-2, LU-3, LU-5, LU-6, there was no need to accept Ms. Gilbert's offer of proof for this document.

meetings in several cities along the proposed transmission line route and requesting public comments on the NOI. In addition, the Department issued review requests to Special Advisory Groups (SAGs), state agencies, local governments, and tribal governments. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 10 of 10016.)

5. On March 2, 2012, the Department issued a Project Order in accordance with OAR 345-015-0160. The Project Order set out the state statutes, administrative rules, and permitting requirements applicable to the construction and operation of the proposed facility and the necessary contents for the ASC. In addition, the Project Order specified the analysis area for the proposed facility. (ODOE - B2HNOIDoc85 B2H-0185 Project Order 2012-03-02, pages 1-40.)

6. On February 27, 2013, Idaho Power submitted its preliminary application for site certificate (pASC) to the Department. (ODOE - B2HAPPDoc1 pASC 00_TOC - 2013-02-28.) The Department, in turn, prepared a review request memorandum to reviewing agencies and compiled a distribution list including all pertinent reviewing agencies listed in OAR 345-001-0010. In accordance with ORS 469.350(2) and OAR 345-021-0050, Idaho Power distributed the Department's memorandum and the pASC to each reviewing agency. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 11 of 10016.)

7. On December 22, 2014, in anticipation of Idaho Power amending the pASC, the Department issued a First Amended Project Order that described and updated the site certificate application requirements. (ODOE - B2HAPPDoc100 First Amended Project Order_12-22-2014, pages 1-34.)

8. The BLM issued its Final Environmental Impact Statement (EIS) in November 2016, and then published its Record of Decision (ROD) on November 17, 2017. The ROD identified the BLM's preferred route for the proposed facility. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 12 of 10016.)

9. In July 2017, Idaho Power submitted an Amended Preliminary Application for Site Certificate (ApASC) to the Department. The Department determined that the ApASC was incomplete and, on September 17, 2017, issued a memorandum to Idaho Power setting out the remaining required information and pending agency comments. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 12 of 10016.)

10. On July 26, 2018, the Department issued a Second Amended Project Order reflecting changes resulting from recent rulemaking and updating the reviewing agency list based on the proposed route and alternative route segments set out in the ApASC. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, pages 1-29.)

11. Between September 2017 and September 2018, the Department reviewed the ApASC and issued formal requests to Idaho Power for additional information (RAIs). The Department issued RAIs pertaining to ASC exhibits and in response to reviewing agency, local government, and tribal government comment letters. Idaho Power provided responses to the RAIs. After reviewing Idaho Power's responses and, where appropriate, consulting with reviewing agencies to verify the sufficiency of information related to ASC exhibit requirements, the Department

determined the ASC complete as of September 21, 2018.²⁸ (ODOE - B2HAPPDoc1 ASC Determination of Complete Application 2018-09-21, pages 1-3; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 14 of 10016.)

12. On October 3, 2018, the Department issued a Public Notice of the complete ASC. The Department published the notice in local newspapers in Morrow, Umatilla, Union, Baker and Malheur counties, emailed the notice to those on the Department's email list serve, and mailed printed notices to approximately 8,300 physical addresses on the Council's special meeting list for the proposed facility. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 13 of 10016.)

13. In the ASC, as a result of its siting studies and the federal review process, Idaho Power proposed a primary route ("the proposed route") and, in certain areas, alternative routes (the West of Bombing Range Road alternative, the Morgan Lake alternative, and the Double Mountain alternative).²⁹ The proposed and alternative routes allowed Idaho Power options in selecting the final route. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 18 of 10016.)

14. In October 2018, the Department held a series of public information meetings on the completed ASC in the cities of Ontario, Baker City, La Grande, Pendleton, and Boardman, Oregon. The Department also provided notice of the complete ASC to reviewing agencies, along with a request for agency reports on the ASC. Idaho Power mailed all reviewing agencies copies of the complete ASC with the notice and a request for an agency report. In November 2018, the Department received comments from the following agencies, special advisory groups, and tribal governments:

- Baker County Planning Department/Board of Commissioners (Special Advisory Group)
- City of La Grande Planning Department
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Oregon Department of Aviation
- Oregon Department of Environmental Quality
- Oregon Department of Forestry

²⁸ Pursuant to OAR 345-015-0190(5), an ASC is complete "when the Department finds that the applicant has submitted information adequate for the Council to make findings or impose conditions on all applicable Council standards."

²⁹ In selecting the proposed and alternative routes identified in the ASC, Idaho Power had to balance a myriad of competing constraints and opportunities, which it discussed in detail in ASC Exhibit B. Constraints that drove Idaho Power to select the routes identified in the ASC included federal land management agency requirements and federal land management plans, Western Electricity Coordinating Council Common Corridor Criteria and prudent utility practice, the ODFW's sage grouse habitat rules and fish and wildlife habitat mitigation policies including the prohibitions against siting an energy facility on lands designated Category 1 habitat, prohibitions against siting an energy facility in an identified protected area, and other requirements imposed as part of the Council review process and compliance with site certificate conditions. (Stippel Rebuttal Test., Issues NC-1 and NC-2, at 11.)

- Oregon Department of Fish and Wildlife
- Oregon Department of Transportation
- Oregon Department of State Lands
- Oregon State Historic Preservation Office
- Oregon Water Resources Department
- Union County Planning Department/Board of Commissioners
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Department of the Navy
- United States Forest Service

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 13-14 of 10016.)

15. In March 2019, Idaho Power submitted additional information and errata in response to the reviewing agency comments and in response to additional information requests from the Department pursuant to OAR 345-015-0190(9). Thereafter, the Department issued a notice and posted the errata information on its website. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 14 of 10016.)

16. On May 16, 2019, the Council appointed the undersigned ALJ as the hearing officer to conduct the public hearings on the draft proposed order and the contested case proceeding. (ODOE - B2HAPPDoc1 DPO Hearing Officer Appointment 2019-05-16, pages 1-3.)

17. On May 22, 2019, the Department issued a Draft Proposed Order (DPO), public notice of a 62-day comment period on the DPO, and notice of public hearings on the DPO. (ODOE - B2HAPPDoc2 DPO Public Notice 2019-05-22, pages 1-4).

18. In June 2019, on the Council's behalf, the ALJ conducted a public hearing on the DPO in each of the five Oregon counties to be crossed by the proposed facility. The Malheur County hearing was held in Ontario on June 18, 2019. The Baker County hearing was held in Baker City on June 19, 2019. The Union County hearing was held in La Grande on June 20, 2019. The Umatilla County hearing was held in Pendleton on June 26, 2019. And the Morrow County hearing was held in Boardman on June 27, 2019. At the June 26, 2019 hearing in Pendleton, the Council extended the public comment period from July 23, 2019 to August 22, 2019, and extended the applicant's deadline to respond to DPO comments by 60 days, from July 23, 2019 to September 23, 2019. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 14-17 of 10016.)

19. On September 19, 2019, Idaho Power requested an extension of time to respond to comments received on the DPO from September 23, 2019 to November 7, 2019, based on the volume and substance of the comments. Chair Beyeler granted the extension via emergency action, which the Council ratified at its September 26, 2019 Council meeting. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 15 of 10016.)

20. On July 2, 2020, the Department issued the Proposed Order on Application for Site

Certificate (Proposed Order), setting out recommended findings of fact, reasoning, recommended conditions and conclusions of law. The Department proposed as follows:

Subject to compliance with the recommended site certificate conditions, the Department recommends that the Council find that preponderance of evidence on the record supports the following conclusions:

1. The proposed Boardman to Hemingway Transmission Line complies with the requirements of the Oregon Energy Facility Siting Council Statutes, ORS 469.300 to 469.520.
2. The proposed Boardman to Hemingway Transmission Line complies with the standards adopted by the Council pursuant to ORS 469.501.
3. The proposed Boardman to Hemingway Transmission Line complies with all other Oregon statutes and administrative rules identified in the second amended project order as applicable to the issuance of a site certificate for the proposed facility.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 697 of 10016.)

Findings related to the Fish and Wildlife Habitat standard

21. In the Second Amended Project Order, the Department stated, in pertinent part, as follows with regard to the requirements of OAR 345-021-0010(1)(p) and the Fish and Wildlife Habitat standard:

The applicant has proposed a “phased survey” approach for data collection during the site certificate review process. * * * For linear facilities, such as transmission lines, there may be situations where the applicant is able to conduct field surveys on several parcels within the site boundary but may not have access on adjacent parcels. In such circumstances, it may be possible that the combination of on-site field surveys plus a desktop evaluation of existing data, aerial photography, and “over the fence” surveys may meet the information requirements of Exhibit P. If the field survey coverage is sufficient for ODOE and Oregon Department of Fish and Wildlife (ODFW) to consider that the information provided is representative of the fish and wildlife habitat, and sensitive species occurrence or habitat, it is possible that this information could be sufficient to be evaluated for compliance with the applicable Council fish and wildlife habitat standard. Exhibit P shall include as much information as possible about the results of the field surveys conducted to date for biological resources and the schedule for future surveys.

Exhibit P shall include an analysis of how the evidence provided supports a finding by the Council that the proposed facility meets the Council’s fish and wildlife habitat standard. Exhibit P must include the results of all surveys for fish

and wildlife habitat in the analysis area. Exhibit P must also identify all state sensitive species that may be present in the analysis area and include the results of surveys for state sensitive species. Also include the survey methodology, including scope and timing of each survey. Surveys must be performed by qualified survey personnel during the season or seasons appropriate to the detection of the species in question. The applicant must also include in Exhibit P its habitat categorization and tables depicting the estimated temporary and permanent impacts, broken down by habitat categories.

* * * * *

Fish and Wildlife Habitat Mitigation Policy (OAR Chapter 635, Division 415) classifies six habitat categories and establishes a mitigation goal for each category. The applicant for a site certificate must identify the appropriate habitat category for all areas affected by the proposed facility and provide the basis for each category designation, subject to ODFW review. The applicant must show how it would comply with the habitat mitigation goals and standards by appropriate monitoring and mitigation.

(ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, pages 18-19 of 29.)

Noxious weed control

22. In ASC Exhibit P1, Attachment P1-5, Idaho Power provided a draft Noxious Weed Plan to describe the measures the Company will take to control noxious weed species and prevent the introduction of these species prior to construction, during construction, and during operation and management of the project. Idaho Power acknowledged that it is the responsibility of the Company and its construction contractors, working with the appropriate land management agencies and the Department, to ensure that noxious weeds are identified and controlled during the construction and operation of the facility and that all applicable federal, state, county, and other local requirements are satisfied. (ODOE - B2HAPPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, page 744 of 940.)

23. As noted in ASC Exhibit P1, Attachment P1-5, the goal of the Noxious Weed Plan is to describe methods for early detection, containment, and control of noxious weeds that will be implemented during project construction and operation. The Noxious Weed Plan describes the known status of noxious weed species within the project site boundary, the regulatory agencies responsible for the control of noxious weeds, and steps Idaho Power will take in controlling and preventing the establishment and spread of noxious weed species during construction and operation of the facility. The Noxious Weed Plan also describes general preventive and treatment measures, monitoring to evaluate of the effectiveness of the prescribed noxious weed prevention and the control measures to be implemented during the operational phase of the project. (ODOE - B2HAPPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, pages 744-69 of 940.)

24. In the Noxious Weed Plan, Idaho Power explained that the Company will only be responsible for controlling noxious weeds that are within project right-of-ways (ROWs) and that are a result of the company's construction or operation-related, surface-disturbing activities in the following areas:

Transmission line: Entirety of the ROWs and/or easements;
New roads: Entirety of the ROWs and/or easements;
Existing roads needing substantial improvement: Only areas involving ground-disturbing construction and/or improvement (e.g., new cutouts);
Communication stations: Entirety of the ROWs and/or easements;
Multi-use areas: Entirety of the temporary ROWs and/or licenses; and
Pulling and tensioning sites: Entirety of the temporary ROWs and/or licenses.

Idaho Power noted that the Company is not responsible for controlling noxious weeds that occur outside of project ROWs or for controlling or eradicating noxious weed species that were present prior to the project. Idaho Power added the following with respect to pre-existing weed infestations:

[Idaho Power] recognizes ORS Chapter 569 imposes onto occupiers of land within a weed district certain obligations to control and prevent weeds; if [Idaho Power] identifies pre-existing weed infestations within a Project ROW, [the Company] will work with the relevant landowner or land management agency to address the same consistent with ORS Chapter 569.

(ODOE - B2HAPPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, page 760 of 940.)

25. In addition to the draft Noxious Weed Plan, Idaho Power also provided in ASC Exhibit P1 a draft Reclamation and Revegetation Plan (Attachment P1-3) and a draft Vegetation Management Plan (Attachment P1-4). The purpose of the Reclamation and Revegetation Plan is to provide a framework for the reclamation treatments to be applied to areas impacted by the project construction, operation, and maintenance activities. (ODOE - B2HAPPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, page 556-592 of 940.) The purpose of the Vegetation Management Plan is to describe the methods in which vegetation along the transmission line will be managed during operation of the project. (*Id.* at page 596 of 940.)

26. In the Proposed Order, Section IV.H.1, General Fish and Wildlife Mitigation, the Department addressed, among other things, Idaho Power's methodology for evaluating habitat quantity and quality within the analysis area, the habitat assessment, the potential impacts to fish and wildlife habitat from construction and operation of the proposed facility, and the proposed habitat mitigation plans. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 313-20 of 10016.) The Department described the components of the draft Reclamation and Revegetation Plan, and as Recommended Fish and Wildlife Condition 1, required Idaho Power to finalize, prior to construction of a phase or segment of the facility, the

draft Reclamation and Revegetation Plan. (*Id.* at pages 320-323 of 10016.) As Recommended Fish and Wildlife Condition 2, the Department required Idaho Power to, prior to construction of a phase or segment of the facility, finalize and submit to the Department for its approval, in consultation with ODFW, a final Vegetation Management Plan. (*Id.* at page 324 of 10016.)

27. In the Proposed Order, the Department described the components of the Noxious Weed Plan and found, in pertinent part, as follows:

The draft Noxious Weed Plan provides for control of the two State-level weed lists - Class A and Class B weeds (including those that have been T-designated),³⁰ along with county-level Class A, Class B, and Class C weeds (Attachment P1-5 Section 2.1 of this order). T-designated weeds indicate that the weed is a priority target for control. Further, the Plan ensures that the list of weeds being managed would be up to date, stating: "IPC will review the county lists on a regular basis to ensure that monitoring and control actions are targeting the appropriate species." If there are weeds listed at the State or county level that are not currently listed in the plan, those weeds would be incorporated during plan finalization, in accordance with the Agency Review Process incorporated by the Department.

The draft Noxious Weed Plan requires pre-construction noxious weed surveys (see Section 4.0 of the plan) for the purpose of establishing pre-disturbance treatment areas, to minimize potential for weed dispersal following commencement of construction activities. The plan also requires vehicle washing stations (wheel washing) in areas identified with noxious weeds, prior to and during construction. During construction and operation, the plan requires control and treatment measures. The final treatment methodologies would be developed based on state and country regulations; applicable land use management requirements; consultation with land managers, county weed boards, and ODOE; and site-specific circumstances; to occur based on the pre-construction Agency Review Process incorporated by the Department consistent with OAR 345-025-0016. The Agency Review Process includes a dispute resolution process to ensure the final plan appropriately satisfies applicable regulatory requirements. * * *

The plan requires agency consultation to establish frequency for long-term monitoring, which would be site-specific. In other words – there may be increased long-term monitoring frequency in disturbance areas with identified noxious weed infestations, and decreased monitoring frequency in disturbance areas without infestations. The plan also addresses ORS Chapter 569, which imposes certain obligations onto occupiers of land within a weed district. To address those obligations, the plan requires that the applicant work with landowners or land management agencies to identify and address weed infestations within the site boundary. Council cannot require the applicant to control weeds outside of the site boundary, either under its standards or ORS Chapter 569, because Council's

³⁰ T-designated weeds are designated by the Oregon State Weed Board for prevention and control by the Noxious Weed Control Program. Action against T-designated weeds receive priority. (Taylor Rebuttal Test. at 12.)

jurisdiction covers the “site” of the proposed facility. However, land owner consultation would be an ongoing mitigation process under the Agricultural Mitigation Plan, Revegetation Plan and Noxious Weed Plan, where adequate opportunities to evaluate potential offsite impacts could be discussed – additionally, county weed districts have funding and the authority to support landowners with recommendations and implementation of control measures.

* * * At this time, other than presence of noxious weeds within the analysis area, no evidence has been provided on the record that questions the validity of the Noxious Weed Plan or the applicant’s ability to implement and adhere to the requirements of the plan.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 324-25 of 10016.)

28. The Department also included, as Recommended Fish and Wildlife Condition 3, the following:

Recommended Fish and Wildlife Condition 3: The certificate holder shall:

a. Prior to construction of a phase or segment of the facility, in accordance with the OAR 345-025-0016 agency consultation process outlined in the draft Noxious Weed Plan(s) (Attachment P1-5 of the Final Order on the ASC), finalize, and submit to the Department for its approval, a final Noxious Weed Plan. The protective measures as described in the draft Noxious Weed Plan provided as Attachment P1-5 to the Final Order on the ASC, shall be included and implemented as part of the final Noxious Weed Plan, unless otherwise approved by the Department.

b. During operation, the certificate holder shall conduct all work in compliance with the final Noxious Weed Plan referenced in sub(a) of the condition.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 326 of 10016; emphasis in original.)

29. After issuance of the Proposed Order, and in response to concerns raised by the limited parties, Idaho Power updated its draft Noxious Weed Plan to provide more clarity. In the updated draft Noxious Weed Plan, Idaho Power added the requirement that the Company will review the state and county lists annually to ensure that monitoring and control actions are targeting the appropriate species. (Taylor Rebuttal Ex. B at 12.) Idaho Power also updated Table 1, Designated Noxious Weeds Known to Occur or with the Potential to Occur within the Site Boundary. (*Id.* at 15.) With regard to preconstruction surveys, Idaho Power added that surveyors will be trained to identify Oregon flora, specifically native plants, noxious weeds, and threatened and endangered plant species. (*Id.* at 27.) With regard to prevention, and in particular vehicle cleaning, Idaho Power added that “all Construction Contractor(s) will clean construction vehicles and equipment at the Project multi-use areas or other cleaning stations each night or

morning prior to returning to the Project construction areas.” (*Id.* at 29.) Idaho Power also noted that it may avoid cleaning construction vehicles and equipment when moving from noxious weed-contaminated areas to other areas along the transmission line ROW if it “demonstrates, in consultation with ODOE and the relevant county weed department, that Idaho Power has sufficiently controlled the weed contamination or that seasonal limitations will be effective in avoiding the spread of the noxious weeds.” (*Id.*)

30. With regard to post-construction treatments, Idaho Power amended the Noxious Weed Plan to state that the Company will implement noxious weed control efforts “at least once annually” for the first five years and, with the concurrence of the Department, will “continue to monitor the sites as described below in Section 6.1, but will cease treatment unless determined to be necessary through subsequent monitoring.” (Taylor Rebuttal Ex. B at 35.) Finally, with regard to monitoring, Idaho Power added monitoring would be initiated during the first “growing season” following construction. (*Id.* at 36.) Idaho Power added that if control of noxious weeds is deemed unsuccessful after five years of monitoring and noxious weed control actions, the Company will coordinate with ODOE regarding appropriate steps forward and “will prepare a location-specific long-term monitoring plan based on the results of the initial five-year assessment period.” (*Id.* at 36.) Finally, Idaho Power added Appendix B to the Plan, addressing Noxious Weed Treatment Methods and Timing. (*Id.* at 43-53.)

31. The revised draft Noxious Weed Plan remains a draft. In accordance with Recommended Fish and Wildlife Condition 3, Idaho Power will update and finalize the Noxious Weed Plan based on the final facility design and agency review. (Taylor Rebuttal Test. at 40.)

32. Enforcement of the noxious weed statutes is outside the scope of the Council’s review. The Council’s Fish and Wildlife Habitat standard focuses on addressing impacts to habitats resulting from a proposed facility. A certificate holder may have additional noxious weed obligations under ORS Chapter 569, for example, a possible duty to address preexisting noxious weed infestations, but those obligations are enforced through the county courts outside of the Council review process. (Taylor Rebuttal Test. at 10.)

Riparian areas

33. The ODFW Fish and Wildlife Habitat Mitigation Policy provides a framework for assigning one of six category types to habitats based on the relative importance of these habitats to fish and wildlife species. In ASC Exhibit P1, Idaho Power assumed fish presence for all streams designated by ODFW as fish bearing streams. For streams not already designated as fish bearing by ODFW, Idaho Power used field data as the primary factor to determine potential fish presence. (ODOE - B2HAPPDoc3-25 ASC 16A_ Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, page 25 of 940.)

34. In ASC Exhibit P1, Idaho Power also identified all fish and wildlife habitat in the analysis area, classified by habitat categories set forth in the ODFW Fish and Wildlife Habitat Mitigation rule, OAR 635-415-0025. In Table P1-3, Idaho Power listed the six habitat category types, by definition and mitigation goal. (ODOE - B2HAPPDoc3-25 ASC 16A_ Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, page 32 of 940.) In table P1-

4, Idaho Power set out the acres of habitat types by ODFW Habitat Category within the project analysis area. Riparian vegetation was classified as either Category 2 or Category 3. This includes a total of 21.6 acres of Herbaceous Riparian (8.4 in Category 2 and 13.2 in Category 3), 5.5 total acres of Introduced Riparian (4.9 in Category 2 and .7 in Category 3), and 60.4 total acres of Riparian Woodland and Shrubland (59 in Category 2 and 1.4 in Category 3). (*Id.* at page 34 of 940.)

35. In the Proposed Order, the Department addressed and approved Idaho Power's methodology for evaluating habitat quantity and quality within the analysis area, the habitat assessment in ASC Exhibit P1, and the identification of habitat within habitat categories set out in ASC Exhibit P1, Tables P1-3 and P1-4. The Department noted that ODFW staff thoroughly reviewed Idaho Power's habitat categorization methodology during the ASC phase. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 316 of 10016.)

36. In the Proposed Order, at Table FW-1 (Estimated Temporary and Permanent Habitat Impacts and Proposed Mitigation – Proposed Route), the Department found that the Proposed Route would temporarily or permanently impact less than 1 acre of Category 2 Riparian Vegetation, and would temporarily impact 5.5 acres of Category 3 Riparian Vegetation. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 318 of 10016.) At Table FW-2 (Estimated Temporary and Permanent Habitat Impacts and Proposed Mitigation – Alternate Route Segments), the Department further found that the Alternate Route Segments would not have any temporary or permanent impacts on Riparian Vegetation. (*Id.* at page 319 of 10016.)

Fish passage

37. There is no Council standard that specifically addresses fish passage. However, under the Council's General Standard of Review, the Council must determine whether the proposed facility complies with all other applicable Oregon statutes and rules identified in the project order. OAR 345-022-0000(1)(b). The Second Amended Project Order directed that Idaho Power address compliance with ODFW's Fish Passage laws, ORS 509.585 and OAR Chapter 635, Division 412. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 24 of 29.)

38. In the Second Amended Project Order, the Department ordered as follows with regard to ASC Exhibit BB:³¹

Include information in Exhibit BB related to the following: Compliance with the ODFW Fish Passage rules will be included in and governed by the site certificate. Provide evidence in this exhibit of the facility's compliance with the applicable Fish Passage rules OAR Chapter 635, Division 412.

(ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 24 of 29.)

³¹ OAR 345-021-0010(1)(bb) requires the applicant to provide “[a]ny other information that the Department requests in the project order or in a notification regarding expedited review.”

39. In ASC Exhibit BB, Idaho Power included its Fish Passage Plan as Attachment BB-2. In Attachment BB-2, Idaho Power explained that the project will include development of new access roads and improvement of certain existing roads and that some of the roadwork will require crossings of fish-bearing streams. Idaho Power added that, based on OAR 635-412-0020, new road construction affecting fish-bearing streams in Oregon will trigger fish passage rules and require review by the ODFW. (ODOE - B2HAPPDoc3-45 ASC 28_ Exhibit BB_Other_Info_ASC 2018-09-28, page 57 of 209.)

40. In the Introduction to the Fish Passage Plan (Attachment BB-2), Idaho Power explained its methodology compliance with the ODFW's Fish Passage rules. Idaho Power stated, in pertinent part:

The determination of fish-bearing streams was originally reported in the Fish Habitat and Stream Crossing Assessment Summary Report (Tetra Tech 2014). The report identified a total of 18 fish-bearing streams that would be crossed by roads, which included 1 new and 17 existing road-stream crossings. The report was submitted to the ODFW and the Oregon Department of Energy (ODOE) in October 2014 for agency review and approval.

Following the submittal of the Tetra Tech (2014) report, crossing types (and alternatives) for each of the 18 fish-bearing road-stream crossings were identified. These determinations were based on existing structure condition, crossing risk analysis, field data, and analyses that utilized site hydrology, stream characteristics, crossing size, and road ingress/egress. * * *.

* * * * *

After the approval of the Tetra Tech (2014) report and Tetra Tech (2015) Fish Passage Plans and design drawings, major route modifications were identified in 2016. As a result, additional surveys were conducted in the summer of 2016 to evaluate the new road crossings established by the route modifications.

* * * * *

The Tetra Tech (2016) report identified a total of 58 fish-bearing streams that would be crossed by access routes within the states of Oregon and Idaho. All routes are on existing roads and all but 4 have existing crossing structures (bridge, culvert, or established ford). Crossing Type 1 or 2 was identified as the proposed alternative for 50 of the 58 sites (see Table 1). Based on OAR Chapter 635, Division 412, Fish Passage, these crossing sites are not expected to trigger ODFW fish passage requirements because they are existing structures that do not require any new construction or major replacement. * * *.

Crossing Types 3A and 3B were selected as proposed alternatives for the remaining seven crossing sites; these crossings were deemed likely to trigger ODFW review because they would require some new construction (see crossings

highlighted in green on Table 1). This document describes the types of crossings associated with the seven fish-bearing stream crossings and provides ODFW Fish Passage Plans and designs for those crossings.

(ODOE - B2HAPPDoc3-45 ASC 28_Exhibit BB_Other_Info_ASC 2018-09-28, pages 57-61 of 209.)

41. In the Fish Passage Plan, Idaho Power used the term “fish-bearing” to describe any stream inhabited by “native migratory fish.” For purposes of evaluating the applicability of the ODFW’s Fish Passage rules to a particular crossing, Idaho Power did not distinguish between the types of native fish (anadromous or resident) in labeling a stream as “fish-bearing.” Rather, Idaho Power considered all streams labeled “fish bearing” in the Fish Passage Plan to be inhabited by “native migratory fish” for purposes of the Fish Passage rules. (James Rebuttal Test. at 10.)

42. Idaho Power identified the fish bearing status of streams by using a combination of desktop and field survey analysis. The desktop analysis included GIS mapping of fish bearing streams along the project route, incorporating data from existing GIS data layers and sources (e.g., StreamNet, ODFW, and the Oregon Department of Forestry) into one GIS layer. Idaho Power created maps of fish bearing streams along the project route and distributed the maps to biologists at the ODFW, USFS, and the BLM for review and comment. (James Rebuttal Test. at 12.) Based on comments received from agency review and other local biologists and further evaluation of GIS information, Idaho Power updated the GIS layer to identify the extent of fish distribution and locations for which the ODFW had already made a fish presence determination, as well as additional upstream extents identified as potentially fish bearing. (*Id.* at 12-13.)

43. Following methods reviewed and approved by the ODFW, Idaho Power conducted fisheries habitat and presence surveys to collect data to determine whether streams not already designated as fish bearing by the ODFW did or could support fish use. Idaho Power also collected habitat data to help describe riparian and instream condition as important components of fish habitat quality. Idaho Power also collected habitat data to provide additional information about project-related risks to assist with the crossing assessments associated with avoidance and minimization measures at each crossing location. (James Rebuttal Test. at 13.)

44. Idaho Power assumed that streams designated as fish bearing by ODFW had fish, so the Company did not evaluate these streams for fish presence during field surveys. Idaho Power evaluated other streams identified as potentially fish bearing primarily based on habitat conditions at or near the crossing. (James Rebuttal Test. at 14.) In 2014 and 2016, Idaho Power surveyed streams and crossing sites in the upper Ladd Creek watershed for the presence of fish. (*Id.* at 15-16.)

45. In ASC Exhibit BB, Attachment BB-2 (Fish Passage Plans and Designs), at Table 1 Idaho Power listed the stream name; the crossing identification number; the nearest proposed route milepost; the ownership (public or private); the fish use; the risk ratings; the existing crossing type (culvert, bridge or ford); the potential crossing types (proposed type and potential alternatives); a description of the crossing type; considerations, if any; and the ODFW Fish

Passage trigger, if any. (ODOE - B2HAPPDoc3-45 ASC 28_ Exhibit BB_Other_Info_ASC 2018-09-28, pages 63-66 of 209.)

46. ASC Exhibit BB, Attachment BB-2 (Fish Passage Plans and Designs) includes design descriptions for seven individual crossings: (1) Little Rock Creek, Site R-33010; (2) Rock Creek, Site R-33011; (3) Rock Creek, Site R-33033; (4) Rock Creek, Site R-33147; (5) Goodman Creek, Site R-65725; (6) Cavanaugh Creek, Site R-66818; and (7) Benson Creek, Site R-68790. (ODOE - B2HAPPDoc3-45 ASC 28_ Exhibit BB_Other_Info_ASC 2018-09-28, pages 75-89 of 209; *see also* James Rebuttal Test. at 18.)

47. None of the road crossings covered in the Fish Passage Plan are located in the upper Ladd Creek watershed. (James Rebuttal Test. at 18.) None of the crossings in the upper Ladd Creek watershed trigger the Fish Passage Approval requirements because Idaho Power is not proposing any new construction or major replacements at any of the road-stream crossings in the upper Ladd Creek watershed. (*Id.*) Regardless of whether the streams in the upper Ladd Creek watershed were identified as fish bearing or non-fish bearing, the Fish Passage Plan and Fish Passage Approval requirements are not triggered because Idaho Power is not proposing construction of any new, or major replacement of existing, artificial obstructions on any of the road-stream crossings in that watershed. (*Id.* at 18-19.)

48. Assuming the presence of Snake River Basin steelhead in the upper Ladd Creek watershed does not change the fact that Idaho Power is not proposing any new, or replacements of, any artificial obstructions in the upper Ladd Creek watershed. Idaho Power included information on the streams in the upper Ladd Creek watershed only as background and context in ASC Exhibit BB, Attachment BB-2. (James Rebuttal Test. at 19.) Moreover, the Fish Passage Rules apply to projects proposed for streams that are inhabited, or were historically inhabited, by native migratory fish; that category includes many different species of trout, including redband, rainbow, and steelhead. Idaho Power's Fish Passage Plan did identify streams in the upper Ladd Creek watershed as containing native migratory fish. Therefore, the fact that there might be an additional species of native migratory fish present (the Snake River Basin steelhead) would not change the outcome of Idaho Power's analysis. (*Id.* at 19-20.)

49. In ASC Exhibit P1, Idaho Power analyzed fish and wildlife habitat across the entirety of the project, including those portions of the project affecting the upper Ladd Creek watershed. In that exhibit, Idaho Power discussed the protocols it used to obtain information on the types of habitat in the project area, and categorize the habitats under ODFW's Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0025). (*See generally* ODOE – B2HAPPDoc3-25 ASC 16A_ Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, pages 12-36 of 940). Idaho Power also explained the mitigation measures it would employ for each habitat category. (*Id.* at pages 773-940).

50. ASC Exhibit P1-7B, the Fish Habitat and Stream Crossing Assessment Summary Report, summarizes the results of field surveys conducted in 2014 and 2016 of potential transmission line or access road crossings of fish-bearing streams along the proposed and alternative routes of the project. The surveys assessed fish habitat conditions, stream crossing characteristics, and the crossing risks. The report also describes the steps Idaho Power Company

(IPC) will take to avoid, minimize, and mitigate the potential stream crossing impacts. (ODOE - B2HAPDoc3-28 ASC 16A_ Exhibit P1_Wildlife_ASC_Part 3_Attach P1-7B 2018-09-28, page 5 of 164.) In ASC Exhibit P1-7B, Idaho Power discussed the assessment methods for the fisheries habitat and crossing surveys. Idaho Power noted that:

The intent was to survey all 128 potential fish-bearing stream crossings (road and transmission line), regardless of perennial, intermittent, or ephemeral designation. However, landowner permission was not granted for all crossing sites. For sites with no access, habitat data were collected, if possible, on the same stream as close to the crossing as access allowed. Some sites had no or only indirect surveys, including 22 sites with no field surveys and another 15 sites that were surveyed at a nearby location other than the direct crossing site.

(*Id.* at page 10 of 164.)

51. In ASC Exhibit P1, Idaho Power described the potential impacts of the project on fish and wildlife species and showed how the project will be consistent with the ODFW's fish and wildlife habitat mitigation goals and standards. Idaho Power included, as ASC Exhibit P1 Attachment P1-6, a draft Fish and Wildlife Habitat Mitigation Plan setting forth the mitigation measures the Company will implement to achieve the goals and standards set out in OAR 635-415-0025. (ODOE - B2HAPDoc3-25 ASC 16A_ Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, pages 778-815 of 940.) Idaho Power considered all fish bearing streams to be Habitat Category 2, including the streams affected by the seven crossings approved in the Fish Passage Plan. In addition, Idaho Power categorized as Habitat Category 2 each of the fish bearing streams in the upper Ladd Creek watershed above the Interstate 84 culvert within the project site boundary. Therefore, Idaho Power will employ the avoidance, minimization, and compensatory mitigation measures applicable to Habitat Category 2 for those streams in the upper Ladd Creek watershed. (James Rebuttal at 24-25.)

52. Habitat categorization depends on the functions and values of the stream course, and whether or not the habitat meets the definitions for irreplaceable, essential, limited, or important as described in OAR 635-415-0005. The presence of a listed fish does not automatically make a stream Habitat Category 1 or 2. (Reif Rebuttal Test. at 7.) Habitat categorization in ODFW's mitigation policy is based on the functions and values of the habitat, regardless of the presence of a migratory fish or a special status species. Therefore, the mere presence of a special status species does not automatically elevate the habitat categorization of a given area. (Reif Cross-Exam. Test., Tr. Day 5 at 84-85.)

53. In the Proposed Order, the Department noted that fish species can exist within degraded habitat and, even with the presence of a state-listed threatened and endangered species, the habitat does not meet ODFW's definition of Category 1 habitat under OAR 635-415-0025(1) because it is replaceable (*i.e.* waterways could be rehabilitated). (ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 316 of 10016, n. 321.)

54. In the Proposed Order, the Department imposed Recommended Fish and Wildlife Condition 4 to ensure that the Fish and Wildlife Habitat Mitigation Plan is consistent with the

ODFW habitat mitigation goals and standards described in OAR 635-415-0025. Recommended Fish and Wildlife Condition 4 requires, among other things, that prior to construction of any phase or segment of the facility, Idaho Power finalize, and submit to the Department for its approval, a final Fish and Wildlife Habitat Mitigation Plan, based on the plan provided as ASC Attachment P-6. The Department specified the information to be included in the final Fish and Wildlife Habitat Mitigation Plan and required that the plan address the potential habitat impacts through mitigation banking, an in-lieu fee program, development of mitigation projects by the certificate holder, or a combination of the same. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 328 of 10016.)

55. In the Proposed Order Section IV.H., Fish and Wildlife Habitat: OAR 345-022-0060, the Department found, in pertinent part, as follows

As depicted in ASC Exhibit P1, Table P1-18, the proposed transmission line would span 47 fish bearing streams and 18 roads would require road or crossing modifications involving fish bearing streams. All of these crossings could potentially include Columbia Basin rainbow trout. The fish passage plans and designs for the seven temporary road crossing structures that would require review by the ODFW are included in Exhibit BB, Attachment BB-3. The Department's evaluation of compliance with ODFW Fish Passage rules is found at Section IV.Q.4., Fish Passage. There, the Department recommends Council find that the applicant's proposed fish passage compliance plan is sufficient to demonstrate compliance with the ODFW Fish Passage rule, that the plan should be finalized prior to construction based on final facility design, and that the plan should be implemented during construction.

* * * * *

Based on the applicant's designs to minimize the number of fish-bearing crossings, and subject to compliance with these fish passage plans and designs, the proposed transmission line is unlikely to adversely affect fish passage. See Section IV.Q.4., Fish Passage, for the Department's assessment of compliance with the ODFW Fish Passage rules and requirements.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 351-53 of 10016.)

56. In the Proposed Order Section IV.Q.4, Fish Passage: OAR 635-412-0035, the Department found, in pertinent part, as follows:

A Report titled, Fish Habitat and Stream Crossing Assessment Summary Report, was submitted to the Department and ODFW in 2014. The report was updated in 2016 and identified a total of 58 fish-bearing streams that would be crossed by access routes within the states of Oregon and Idaho, of which seven crossing sites were identified as potentially triggering ODFW fish passage. Table 1 in ASC Exhibit BB, provides the stream name, proposed crossing type, and fish passage

information. Crossing Types 3A and 3B were the crossing designs selected for the seven crossing sites; these crossings were deemed likely to trigger ODFW review because they would require some new construction.

* * * * *

If any future route modifications require road crossing improvement or modifications beyond those identified in the fish passage plans, as explained in the Fish Passage Plan, the applicant proposes to install all culverts or other stream crossing structures in accordance with ODFW fish passage rules and approvals. Furthermore, comments received by the public suggest that certain culverts on Ladd Creek, which was not identified in the application as supporting anadromous fish, were recently modified and as a result Ladd Creek now contains anadromous fish. To ensure any such new information about stream status and related fish passage is addressed prior to construction, the applicant proposes to request any new information about stream status from ODFW and seek ODFW concurrence on stream status prior to finalizing the Fish Passage Plan.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 693-94.)

57. In the Proposed Order, the Department also recommended Fish Passage Condition 1, which, among other things, requires Idaho Power to “finalize, and submit to the Department for its approval in consultation with ODFW, a final Fish Passage Plan.” (ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 694.) Furthermore, the Department required that, as part of finalizing the Fish Passage Plan, “the certificate holder shall request from ODFW any new information on the status of the streams within the site boundary and shall address the information in the final Fish Passage Plan.” (*Id.*) The Department recommended that Council conclude that the proposed facility, including the proposed and alternative routes, complies with the Fish Passage Requirements of OAR Chapter 635, Division 412. (*Id.* at 695-96.)

58. ASC Exhibit P1-7B, Table 3 identifies five road-stream crossing locations in the Ladd Creek watershed with “non-fish” stream designations (R-37018, R-37117, R-37121, R-37124, R-35660). (ODOE - B2HAPDoc3-28 ASC 16A_Exhibit P1_Wildlife_ASC_Part 3_Attach P1-7B 2018-09-28, page 24 of 164.) While ODFW found that Idaho Power’s methods for evaluating fish presence generally supports the “non-fish” designations for these five crossings, ODFW was not able to definitively identify the exact location of these five crossings in the maps provided in the ASC and therefore could not confirm the non-fish determinations at these crossing locations. (Apke Rebuttal Test. at 2-3.) If Idaho Power provided better maps, ODFW may be able to affirm the non-fish designation for these locations or require that the designation be changed to fish bearing. If the fish use determinations for any of these stream crossings changed from non-fish to fish bearing, then Idaho Power would need to coordinate with ODFW and conduct new crossing evaluations to inform whether the Fish Passage rules apply to these crossings. (*Id.* at 2-4.)

59. To address the concern that ODFW was unable to confirm the non-fish designations at these five unnamed stream crossings, the Department recommended revisions to Recommended Fish Passage Condition 1, paragraph (a). The Department recommended including a requirement that, as part of Idaho Power finalizing the Fish Passage Plan, Idaho Power further confer with ODFW about these crossings:

In addition, the certificate holder shall seek concurrence from ODFW on the fish-presence determinations for non-fish bearing streams within the Ladd Creek watershed, as presented in ASC Exhibit P1-7B Table 3. If the certificate holder in consultation with ODFW, determines any of the previously identified non-fish bearing streams within the Ladd Creek Watershed to be fish bearing, the certificate holder shall complete a crossing risk evaluation and obtain concurrence from ODFW on applicability of fish passage requirements. If fish passage requirements apply, certificate holder shall seek approval from the Energy Facility Siting Council of a site certificate amendment to incorporate ODFW approval of new crossings and fish passage design/plans and conditions.

(ODOE Rebuttal to Direct Testimony, Evidence and Response to Proposed Site Certificate Conditions at 43; *see also* Apke Rebuttal Test.)

Findings related the Historic, Cultural and Archaeological Resources (HCA) standard

60. ASC Exhibit S must include information about historic and cultural resources within the analysis area that have been listed, or would likely be eligible for listing, on the National Register of Historic Places (NRHP) and archaeological resources within the analysis area. ASC Exhibit S must also include information about the significant potential impacts, if any, of the construction, operation and retirement of the proposed facility on these resources and a plan for protection of those resources. The protection plan must include the applicant's proposed monitoring program, if any, for impacts to historic, cultural and archaeological resources during construction and operation of the proposed facility. OAR 345-021-0010(1)(s).

61. In the Second Amended Project Order, the Department directed Idaho Power to include the survey methodology, survey areas, and the results of all surveys conducted for historic, cultural, and archaeological resources, and an analysis of any significant adverse impacts anticipated and proposed mitigation measures. In addition, the Department directed Idaho Power to include maps showing important historic trails located within the Historic, Cultural, and Archaeological Resources analysis area,³² including the segments of the Oregon Trail that are listed or eligible for listing on the NRHP, and discuss measures to avoid or mitigate for impacts to historic trails. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 21 of 29.)

³² For purposes of the HCA Standard, the analysis area includes all areas within the project site boundary (the Direct Analysis Area) and the area that extends five miles or to the visual horizon, whichever is closer, on either side of the centerline of the Proposed Route and alternative segments. The Direct Analysis Area plus this five-mile radius make up the Visual Assessment Analysis Area, also known as the Area of Potential Effects (APE). (ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 21 of 783.)

62. In the Second Amended Project Order, the Department recognized that, due to restricted access to some portions of the site boundary, Idaho Power would be unable to demonstrate compliance for the entirety of the analysis area prior to obtaining a site certificate. To address this limitation, on April 24, 2018, the Department issued a memorandum titled “Energy Facility Siting Council Decisions for Linear Facilities with Restricted Access within a Site Boundary: Boardman to Hemingway Transmission Line.” This memo outlined how the Department will review applications and make recommendations to Council for historic, cultural and archaeological resources that were evaluated in the pASC and ASC. In the Second Amended Project Order, the Department also explained that once Idaho Power gains access to previously restricted areas, the Company shall include that information via a site certificate amendment process. The Department directed Idaho Power to include in ASC Exhibit S as much information as possible about the field surveys conducted to date for cultural resources on state, private, and federal lands, and the schedule for future surveys. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 21 of 29; Ranzetta Rebuttal Test. at 10.)

63. As discussed previously, because the proposed facility crosses stretches of land managed by the BLM, the project is also subject to federal permitting processes. The BLM is the lead federal agency responsible for completing the NEPA environmental impact analysis, which addresses, among other things, the potential cultural, historic, and archaeological impacts caused by the project and compliance with the National Historic Preservation Act (NHPA), Section 106. The BLM issued its final Environmental Impact Statement (FEIS) in November 2016 and its Record of Decision (ROD) in November 2017. The FEIS and ROD included the results of the BLM’s government-to-government tribal consultations and consultations with other parties with interest in the project’s cultural resources impacts. (Ranzetta Rebuttal Test. at 12-13; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 440 of 10016).

64. The BLM’s NHPA Section 106 process for the B2H project resulted in a Programmatic Agreement (PA). The PA outlined the process for identifying and evaluating historic and cultural properties, assessed the effects of the project on historic and cultural properties, and set out measures to avoid, minimize and mitigate adverse effects that may be caused by the project on federal public land. The PA included provisions requiring the BLM, in consultation with the parties to the PA, to draft a Historic Properties Management Plan (BLM HPMP) that characterizes the historic properties identified within the project area. The BLM HPMP will be used as a guide to address measures to avoid, minimize, and mitigate adverse effects to historic properties located on federal land. Idaho Power included the PA as ASC Exhibit S, Attachment S-5.³³ (Ranzetta Rebuttal Test. at 15-16; ODOE - B2HAPPDoc3-36 ASC

³³ The following agencies and entities were required signatories to the PA: BLM, USFS, Bonneville Power Administration, US Army Corps of Engineers, BOR, Oregon State Historic Preservation Officer, Idaho State Historic Preservation Officer, Washington Dept. of Archaeology and Historic Preservation, the Confederated Tribes of the Umatilla Indian Reservation Tribal Historic Preservation Officer, and the Advisory Council on Historic Preservation. The following entities were invited and/or concurring signatories to the PA: Idaho Power, the Department, US Fish and Wildlife Service, National Park Service, Oregon-California Trails Association, Oregon Historic Trails Advisory Council, Lewis and Clark

19_Exhibit S_Cultural_ASC_Public 2018-09-28, pages 325-54 of 783.)

65. In ASC Exhibit S, Idaho Power set out its cultural resources inventory methodology aimed at ensuring compliance with the Council's HCA standard. Idaho Power described the studies that were, and will be, conducted to locate, identify, and assess the significance of historic and cultural resources and archaeological sites within the analysis area. (ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, pages 27-29 of 783.)

66. Idaho Power identified cultural resources within the analysis area that are listed, or have been determined or recommended eligible for listing, on the NRHP. Idaho Power also included resources that have not been evaluated for NRHP eligibility (*i.e.*, unevaluated) as potentially NRHP-eligible resources. Idaho Power completed its evaluation of cultural resources in accordance with the PA. Idaho Power's inventory and analysis involved a records search, literature review, and multiple field studies. Idaho Power will continue to perform additional inventorying and evaluating of cultural resources in accordance with the PA and Council standards. (Ranzetta Rebuttal Test. at 21-22.)

67. Idaho Power conducted its field surveys consistent with applicable survey protocol plans discussed in the PA. The field surveys include a Cultural Resources Pedestrian Survey of the Direct Analysis Area and surveys in support of the Visual Assessment of Historic Properties Study Plan (VAHP Study Plan) within the Visual Assessment Analysis Area. (Ranzetta Rebuttal Test. at 27; ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 30 of 783; *see also* ASC, Exhibit S, Attachment S-2: Visual Assessment of Historic Properties Study Plan, ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 196 of 783.)

68. Idaho Power prepared its methodology for assessing indirect impacts to historic properties (the VAHP Study Plan) in consultation with the Section 106 Cultural Resources Working Group. The VAHP Study Plan, ASC Exhibit S, Attachment S-2,³⁴ guided the Visual Assessment of aboveground resources potentially affected by the construction and operation of the proposed facility. (Ranzetta Rebuttal Test. at 27.) Idaho Power conducted its visual assessment of above-ground resources in accordance with the VAHP Study Plan, and in two phases, the reconnaissance level survey (RLS), Phase 1, and the intensive level survey (ILS), Phase 2. (*Id.* at 37-39.) The ultimate goal of the visual assessment was to identify those adverse indirect visual effects on historic properties and trails that might diminish the integrity and the characteristics that make the historic property or trail eligible for the NRHP. (Ranzetta Rebuttal Test. at 43-44; *see also* ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 217 of 783.)

The pre-construction finalization of the HPMP will be based on a final visual assessment of historic properties (Phase 7), conducted in accordance with the Visual Assessment of Historic Properties Study Plan (ASC Exhibit S Attachment S-2), which will be reviewed and commented on by federal and state agencies, and consulting parties through the BLM's Programmatic Agreement (ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28. Page 224 of 783).

OCTA, a non-governmental agency focused on protection and preservation of ONHT resources is a concurring party to the Programmatic Agreement and therefore will, prior to construction of the transmission line, review and comment on the impacts and mitigation resulting from the final visual

assessment of historic properties, including ONHT resources (ODOE - B2HAPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28. Page 327 of 783, lines 17-20).

69. Idaho Power completed cultural resources field surveys for the project consistent with applicable survey protocol plans. Idaho Power has not yet completed the Enhanced

Heritage Trail Foundation, Burns Paiute Tribe, and the Fort McDermott Paiute and Shoshone Tribe. (ODOE - B2HAPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, pages 353-72 of 783.)
³⁴ ODOE - B2HAPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, pages 196-234 of 783.

Archaeological Survey (EAS), but will do so following issuance of the site certificate and prior to construction. This future survey will address archaeologically sensitive areas, parcels that were not accessible during the pedestrian survey and impacted, unavoidable resources in the final design of the project. (ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 30 of 783; Ranzetta Rebuttal Test. at 33-34.)

70. In ASC Exhibit S, Idaho Power noted that the project will cross areas that include state and national historic trails (NHT). The Company explained:

The Oregon NHT is the only NHT within the direct analysis area and is crossed 17 times by the direct analysis area Project in four counties. Separate from the NHT, the direct analysis area crosses a total of 12 segments of the Oregon Trail identified by Project surveys documented in confidential Attachments S-6 and S-10. Seven of these crossings are within the construction footprint. A total of 24 segments of the Oregon Trail documented by Project surveys are within the Visual Assessment analysis area. Three of the Oregon Trail segments documented by Project surveys are NRHP-listed: 35MW00224 (Well Spring, Oregon Trail Site), 35MW00227, 35MW00230 (Emigrant Cemetery), and Oregon Trail - Well Spring Segment. All three sites are within the Visual Assessment analysis area. No NRHP-listed segments of the Oregon Trail are within the direct analysis area.

(ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 131 of 783.)

71. In the VAHP Study Plan, Idaho Power employed a visual assessment methodology specific to NHTs and associated resources (*e.g.*, stage stations and/or gravesites), providing methods to identify and record historic trail segments during the assessment phases. Idaho Power's consultants assessed indirect effects by using GIS modeling and mapping overlays, analyzing aerial photographs, determining whether the resource has potential views of the proposed facility, and whether those potential views would diminish the characteristics that make the trail-related resource eligible for the NRHP. (Ranzetta Rebuttal Test. at 40; *see also* ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, pages 211-218 of 783.)

72. As ASC Exhibit S, Attachment S-9, Idaho Power submitted a draft Historic Properties Management Plan (EFSC HPMP), prepared specifically for the Department to demonstrate compliance with the Council's siting standards and certification process.³⁵ The

³⁵ The Introduction to the EFSC HPMP explains:

Although the PA can support the EFSC process, the PA does not supersede the EFSC site certificate process and cannot be fully relied upon to determine compliance with EFSC's standards. Therefore, this HPMP was prepared specifically for ODOE and to comply with the EFSC certification process. It may be modified as necessary following completion of the BLM's HPMP or incorporated as appropriate into the BLM's HPMP through BLM's consultation with ODOE as a party to the PA.

(Proposed Order, Attachment S-9, page 1; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9597 of 10016.)

ESFC HPMP describes the methods for determining NRHP eligibility and effects and provides a general overview of the measures Idaho Power will implement to avoid, minimize and mitigate adverse effects to cultural resources that may result from the project. The cultural resources addressed in the EFSC HPMP include properties listed on, or likely to be listed on, the NRHP (NRHP-eligible and including sites determined significant in writing by a Native American tribe), archaeological sites on public or private land, and archaeological objects on private land within the project site boundary. (ODOE - B2HAPPDoc3-36 ASC 19_ Exhibit S_Cultural_ASC_Public 2018-09-28, pages 699-747 of 783; *see also* ODOE - B2HAPPDoc3-54 ASC Exhibit S_Att. S-9_HPMP Errata Info 2019-03-06, pages 1-8.)³⁶

73. The EFSC HPMP includes an avoidance and mitigation plan, describing the measures that Idaho Power has taken or will take to avoid, minimize, and/or otherwise resolve impacts to cultural resources under the Council's standards. The EFSC HPMP also includes a monitoring plan to document the effectiveness of the avoidance and mitigation measures and the circumstances under which cultural resource monitors will be present. In addition, the EFSC HPMP includes an inadvertent discovery plan that specifies the procedures to follow if Idaho Power discovers a cultural resource during construction, reclamation, and operation and maintenance that was not detected during surveys conducted prior to ground-disturbing activities. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 9597-98 of 10016; Ranzetta Rebuttal Test. at 17.)

74. As set out in the ESFC HPMP, Idaho Power's fieldwork during the RLS phase of the visual assessment identified 764 built environment resources in the Visual Assessment Analysis Area, including multiple crossings of historic trails and pre-contact resources, such as quarries and cairns. The ILS (Phase 2) of the Visual Assessment addressed 231 of these resources, including: NRHP-listed resources, resources that were recommended for additional study or NRHP evaluation, or unevaluated resources; archaeological sites with aboveground features; or newly identified resources following an updated literature search and data gap analysis to cover portions of the project that were not previously identified. Of the 231 resources addressed in the ILS study, 130 were evaluated for project effects and 101 were eliminated. (ODOE - B2HAPPDoc3-36 ASC 19_ Exhibit S_Cultural_ASC_Public 2018-09-28, page 778 of 783). As a result of the project effects analysis, Idaho Power anticipated potential adverse effects for 39 resources. (Ranzetta Rebuttal Test. at 45-46; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9615 of 10016.)

75. The ESFC HPMP further states:

Fourteen of the 39 resources require further consultation and research before making a recommendation on Project effect avoidance, minimization, and/or mitigation strategies. The Project will cross three historic properties with the potential for direct adverse effects. A list of sites with potential adverse effects is

³⁶ The February 2019 Errata Sheet provides requested additional information and documents associated changes to the HPMP. (ODOE - B2HAPPDoc3-54 ASC Exhibit S_Att. S-9_HPMP Errata Info 2019-03-06, page 1 of 8.)

provided in Table 4-1. The majority of potential adverse effects could occur to stacked rock features/cairns. Due to the difficulty in dating and attributing cultural origin, additional consultation with ODOE, SHPO, and tribes will be conducted as an interim step towards determining if mitigation would be appropriate. Resource-specific management and/or treatment plans will be developed as needed as a result of consultations.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9615 of 10016.)

76. In addition to considering the potential for site-specific impacts, Idaho Power performed an analysis that considered the potential cumulative impacts of the proposed facility on Oregon Trail resources. In Idaho Power's cumulative impacts analysis, the Company considered several variables that would bear on the magnitude of the cumulative impacts to the Oregon Trail, including distance, intervening topography, vegetation, atmospheric conditions, and the built environment. In many instances, previous introduction of roads, interstate highways, pipeline rights-of-way, electrical distribution and transmission lines, fence lines, and other forms of development already diminished the physical setting and/or landscape surrounding the Oregon Trail. Idaho Power also considered the trail segment's historical integrity, as over time, development has either diminished or stripped parts of the Oregon Trail of attributes contributing to the segments' historical importance, creating a disconnected historic district with contributing and non-contributing sections and sites. (Ranzetta Rebuttal Test. at 48-51; ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 98 of 783.)

77. As a result of the cumulative impacts analysis, Idaho Power found that 43.89 miles of the Oregon NHT would have a potential view that is within 0.5 mile of the project's site boundary. For "Contributing Trail Segments" or segments of the Oregon Trail that have been previously identified by surveys or listed on the NRHP, Idaho Power reported that approximately 89.35 miles of these segments fall within the Visual Assessment Analysis Area and about 27.43 of those miles would have a potential view of the facility. As noted in the EFSC HPMP, although the cumulative effect data provides a general indication of the magnitude for indirect impacts, the resource-specific analysis performed during the ILS is more precise in its assessment of impacts to contributing resources associated with the Oregon Trail and informs Project planning in an effort to avoid, reduce, or mitigate impacts. (Ranzetta Rebuttal Test. at 51-52; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9618 of 10016.)

78. In the Proposed Order, the Department noted that it is a concurring party to the executed PA and that the provisions of the PA may be used to assist the Council in its review of the HCA Standard. In describing the interplay between the PA, the BLM HPMP, and the EFSC HPMP, the Department explained:

[W]hile the PA is not a binding document upon the Department and EFSC, as is described in this section, the Department is recommending use of the PA process, including the HPMP, to align to the maximum extent feasible, the EFSC review

with the federal government review as directed, by ORS 469.370(13). The PA allows for the final determinations of the potential impacts from the proposed facility to historic and cultural properties (including NRHP-listed, -eligible, and unevaluated resources) and the mitigation of adverse impacts that will be outlined in a Historic Properties Management Plan (HPMP). A HPMP required by the PA will be submitted to the BLM and will be reviewed by all PA parties, it is anticipated to be specific to compliance with Section 106 of the National Historic Preservation Act.

In order to address resources that are also protected under the EFSC standard (archaeological resources and objects on private lands, regardless of NRHP-eligibility status), an EFSC-specific HPMP for private and state lands is included as Attachment S-9 to Exhibit S and this order. The EFSC-specific HPMP is intended to maintain compliance with the EFSC standard as well as align with the evaluation, determinations, and mitigation that would be included in the HPMP required by the PA. The HPMP includes an Inadvertent Discovery Plan (IDP), which specifies steps to be taken if a previously unidentified cultural resource is discovered during construction, including stopping construction in the resource vicinity, agency and Tribal government notification and consultation, and data recovery or other mitigation and protection measures.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 440-41 of 10016.)

79. The Department further explained:

The applicant provides an impact assessment to satisfy OAR 345-022-0090(1)(a) which considers the likely NRHP-eligible Oregon Trail/NHT resources as a linear resource, consistent with [the SHPO's] Linear Resources Guidelines, and by individual trail segment, as summarized in Table HCA-3, NRHP-Eligible Oregon Trail/NHT Inventory in Analysis Area with Potential Indirect Impacts. The BLM, in consultation with SHPO, would determine appropriate mitigation for impacts based on a cumulative impact analysis from treating trail segments as a linear resource. Because BLM and SHPO review, during the Section 106 process, would evaluate cumulative impacts to the Oregon Trail/NHT as a linear resource and not necessarily the impacts of the proposed facility to individual trail segments within the affected area (i.e. location or county), Council must evaluate potential impacts and appropriate mitigation in this order, consistent with OAR 345-001-0010(33), based on potential impacts to listed or likely NRHP-eligible individual trail segments within the affected area.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 448 of 10016.)

80. With regard to appropriate mitigation for potential adverse impacts to Oregon Trail resources, the Department recommended as follows:

Based on the extent of potential adverse visual impacts to the NRHP-eligible Oregon Trail/NHT resources and within the 5-mile viewshed of the resource identified in Table HCA-3, presented in ASC Exhibit S Attachment S-10, the Department recommends Council require that mitigation include at least one minimization measure (design modification) and one measure resulting in restoration; preservation and maintenance; or compensation (OAR 345-001-0010(33)(b) and (c), (d) or (e)) directly benefiting the affected area – which the Department recommends be defined as the county within which the impacted resource is located. The Department notes that mitigation established through the federal Section 106 compliance review may be used to satisfy the EFSC mitigation requirement for listed or likely NRHP-eligible Oregon Trail/NHT trail segments if applicant can demonstrate that it addresses both the design modifications and the restoration; preservation and maintenance; or compensation mitigation within affected area (county), as included in the below Table HCA-4b (included in the HPMP). If not duplicated through the federal Section 106 process, the applicant shall establish the scope and scale of Table HCA-4b mitigation, prior to construction, subject to Department review and approval, in consultation with SHPO, its consultants, or other entities with expertise with historic trails.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 471 of 10016.)

81. In Table HCA-5b, the Department recommended that the EFSC HPMP establish the following mitigation for each impacted NHRP-Eligible Oregon Trail/NHT Segment: Design modification and at least one of the following, in order of priority:

- Purchase of conservation easement or other land protection where trail traces exist;
- Historic trails restoration within and outside the facility area;
- Land acquisition;
- Public signage, publication/print/media, and/or interpretive plans;
- Trail segment management plans;
- Additional literature or archival review (e.g. historic maps, local papers);
- Remote sensing;
- National Register nomination; Recording—
including HABS/HAER/HALS; [or]
- Funding for public interpretation, archeological resource, or other program benefiting Oregon Trail resources.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 471 of 10016.)

82. In the Proposed Order, the Department noted that some resources, including resources evaluated under the HCA standard, require field studies either during the preparation

of the ASC, or prior to construction of the facility that incorporates the final design and placement of facility components. The Department recommended that the certificate holder submit additional survey information as preconstruction conditions of approval included in the site certificate based upon the extensive and long-term, multi-year, comprehensive field-surveys, database reviews, and technical evaluations Idaho Power completed to inform certain ASC exhibits, including Exhibit S. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 53 of 10016.) The Department also noted that this approach for submitting additional survey information “provides an alternative to the recommendations outlined in the Department’s Energy Facility Siting Council Decisions for Linear Facilities with Restricted Access within a Site Boundary: Boardman to Hemingway Transmission Line memo (April 2018).” (*Id.* at page 54 of 10016, n. 54.)

83. In the Proposed Order, the Department found that the proposed facility would not result in a direct physical disturbance to any listed or likely NRHP-eligible Oregon Trail segments, but would “indirectly (crossing/visibility) impact some Oregon Trail segments.”³⁷ (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 449 of 10016.) The Department agreed with Idaho Power’s visual impact assessment, including visual impacts directly above the resource (crossing) and within a five-mile viewshed. The Department also found that, without mitigation, the proposed facility would result in adverse indirect impacts to nine NRHP-listed or eligible Oregon Trail/National Historic Trail segments (identified in the Proposed Order at Table HCA-3). (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 460-69 of 10016.)

84. In the Proposed Order, the Department included Recommended HCA Condition 1 requiring Idaho Power to “design and locate facility components to avoid direct impacts to Oregon Trail/National Historic Trail resources” consistent with the EFSC HPMP. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 474 of 10016.)

85. The Department also included Recommended HCA Condition 2, which requires Idaho Power to submit to the Department, SHPO, and applicable tribal governments for review to the Department for approval a final EFSC HPMP, based on new survey data from previously unsurveyed areas and the final design of the facility. Recommended HCA Condition 2 also requires that Idaho Power conduct all construction activities in compliance with the final Department-approved EFSC HPMP. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 514 of 10016.)

86. Proposed Order Table HCA-7 lists all the resources inventoried in the site boundary/Direct Analysis area and within the Visual Assessment Analysis Area that may experience a direct or indirect impact, including resources that may potentially be protected

³⁷ The Department explained that a direct impact is ground disturbing construction activity or permanent infrastructure placement, whereas indirect impacts include being able to see the proposed transmission line, towers, or a proposed access road from a resource or trail location. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 449 of 10016.)

under OAR 345-022-0090(1)(a) and OAR 345-022-0090(1)(b) of the ESFC standard.³⁸ Based on information provided by limited party John Williams, the Department added "Site 6B2H-MC-10," located on property owned by Mr. Williams in Union County, to Table HCA-7 as a potentially impacted historic property or archaeological site on private land. Site 6B2H-MC-10 is described as a hunting blind, an unevaluated resource within the Visual Assessment Analysis Area (5.14 meters south of the Direct Analysis area southern boundary) on the Morgan Lake Alternative Route. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 499 of 10016.)

87. Based on the findings in the Proposed Order, and subject to compliance with the recommended conditions of approval, the Department concluded that, taking into account mitigation, the construction and operation of the proposed facility, including proposed and alternative routes, is not likely to result in significant adverse impacts to any historic, cultural, or archaeological resources, in compliance with the Council's Historic, Cultural, and Archaeological Resources standard. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 515 of 10016.)

88. On June 28, 2021, based on a nomination by the Oregon State Advisory Committee on Historic Preservation and the Oregon SHPO, the La Grande to Hilgard Segment of the Oregon Trail (linear district) was officially listed in the National Register of Historic Places. (Williams Direct Test., Ex. 13.)

Findings related to the Land Use standard

89. In the Second Amended Project Order, the Department stated, in pertinent part, as follows with regard to ASC Exhibit K, Land Use:

Although local comprehensive plans and land use ordinances may have been amended since local comments were provided, ORS 469.504(1)(b)(A) and OAR 345-021-0050(6)(b)(A) require that the applicable local land use criteria are those in effect on the date the preliminary application for site certificate was submitted, February 27, 2013, for the local jurisdictions identified in the preliminary application. This includes Morrow, Union, Umatilla, Baker, and Malheur counties, and the City of North Powder.

* * * * *

Exhibit K shall include information necessary to demonstrate compliance with the applicable substantive criteria from each county and city code and comprehensive plan that are applicable to issuance of the required permits and approvals.

Exhibit K shall also provide evidence that the proposed facility would comply with the applicable statutory requirements related to the proposed facility, including ORS 215.283, and 215.275 and specifically including all requirements

³⁸ See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 481-92 of 10016.

regarding the location of the proposed facility within EFU zones.

(ODOE - B2HAPDoc15 ApASC Second Amended Project Order 2018-07-26, pages 15-16 of 29.)

90. The proposed transmission line crosses forest-related land use zones in Umatilla and Union Counties. In Union County, the proposed facility crosses land in the Timber-Grazing Zone, a hybrid farm-forest zone that includes farmland, rangeland, and forestland. (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, pages 42, 238 of 614.)

91. The Union County Zoning, Partition and Subdivision Ordinance (UCZPSO) requires land in the Timber-Grazing Zone to be evaluated based on its “predominant use” to determine whether it is Goal 3 farmland or Goal 4 forestland.³⁹ Idaho Power worked with Union County planning staff to determine the predominant use of each of the 61 Union County parcels within the project site boundary located in the Timber-Grazing Zone. (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 238 of 614.)

92. To determine the predominant use on each Union County hybrid-zoned parcel, Idaho Power used data from the National Resources Conservation Service Soil Survey Geographic Database (SSURGO), Union County tax lot data, and GIS mapping software. Based on a table provided by Union County planning staff listing each SSURGO soil type and the corresponding predominant use value for each soil type, Idaho Power assigned each parcel an initial predominant use value. Idaho Power then had Union County review each parcel’s initial predominant use value against 2011 aerial photography and tax lot records to adjust the predominant use to reflect current land use. (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 239 of 614.)

93. Union County’s review of Idaho Power’s predominant use analysis did not result in any adjustments to the predominant use value Idaho Power initially assigned to parcels in the Timber-Grazing Zone. For 18 of the 61 parcels in the Timber-Grazing Zone located near the National Forest, there was no SSURGO data available. Therefore, for these 18 parcels, in the

³⁹ In this context, Union County defines “predominant use” as “the most common use of a parcel when differentiating between farmland and forest land.” UCZPSO 1.08. The Union County Zoning Ordinance further states:

In determining predominant use NRCS Soil Conservation Service soil maps will be used to determine soil designations and capabilities. The results of this process will be the most important method in determining the predominant use of the parcel. Other factors which may contribute to determining predominant use include parcel characteristics such as a commercial stand of timber, and the current use of the property. Removing a commercial stand of timber from a property will not result in a conversion of predominant use unless the property is disqualified as forest land by the Oregon Department of Forestry.

(UCZPSO 1.08.)

absence of soil data, Idaho Power conservatively determined that the land had a predominant use of forestland. (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 239 at 614.)

94. Idaho Power's predominant use analysis for the 61 parcels crossed by the proposed project in Union County's Timber-Grazing Zone showed that the predominant uses within the site boundary are split between forest and range land, with a negligible amount of high value crop land. (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 239 of 614.) Idaho Power determined that, for the Proposed Route in Union County, approximately 53 percent of Timber-Grazing zoned land has a predominant use of rangeland and about 47 percent had a predominant use of forestland. For the hybrid-zoned land along the Morgan Lake Alternative Route, Idaho Power determined that about 60 percent had a predominant use of rangeland and about 40 percent was forestland. (*Id.*)

95. In ASC Exhibit K, Attachment K-2, the Right-of-Way Clearing Assessment, Idaho Power addressed existing forestry practices adjacent to the project and impacts to those practices that may occur as a result of the construction and operation of the project. Idaho Power described the county costs of the project within the forested lands analysis area. Idaho Power explained that Union County has 899,000 acres (69%) of forestland out of a total land area of 1,303,000 acres.⁴⁰ Idaho Power explained that the "economic impact to forest sector jobs in Union County is approximately \$97,000, which will be partially offset by agriculture or range land uses after the conversion." (ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 613 of 614.)

96. In ASC Exhibit K, Attachment K-2, Idaho Power also represented as follows:

The Forested Lands Analysis Area includes approximately 1,249 acres of forest and range lands; however, the forested acreage subject to permanent impact by conversion is substantially less (approximately 776 acres). Based on the results of the forested lands survey and analysis of the potential impacts and efforts to minimize and mitigate for project impacts, the Project will not cause (1) a substantial change in accepted forest or farm practices; or (2) a significant increase in the cost of accepted forest or farm practices on either lands to be directly impacted by the Project or on surrounding lands devoted to farm use.

(ODOE - B2HAPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, pages 613-14 of 614.)

⁴⁰ As addressed in the *Ruling on Issues LU-2, LU-3, LU-5 and LU-6*, in ASC Exhibit K, Attachment 2, Idaho Power erred in calculating the percentage loss to the forestland base in Umatilla and Union Counties. However, the math errors were not material to Idaho Power's Goal 4 analysis and/or the proposed facility's compliance with the Land Use Standard. As pertinent here, in Union County, the percentage of land that would be converted from forestland to agricultural or range use is actually .059 percent (and not .00059 percent, as erroneously stated in ASC Exhibit K). See *Ruling on Issues LU-2, LU-3, LU-5 and LU-6* at 6, 15-16.

97. In ASC Exhibit K, Attachment K-1 (the Agricultural Lands Assessment), Idaho Power analyzed in detail the accepted farm practices in the area surrounding the project and the project's potential impacts on such practices. Idaho Power explained that the agricultural practices within the Agricultural Assessment Area in Union County included rangeland, rangeland/timber, and pasture and that potential impacts of the project include temporary (construction) and permanent (operational) disturbances, as well as the indirect impacts associated with these disturbances and the type of agricultural use disturbed.⁴¹ Idaho Power noted that indirect impacts may include growth-inducing effects caused by the project but occur later in time or farther removed in distance. Indirect impacts may also include changes in the pattern of land use, population density or growth rate, and the related effects of those changes on agriculture. Idaho Power reported that it will take minimization and mitigation actions to address potential impacts to agriculture, including but not limited to the following: restoring land to its former condition; compensating landowners for damages and/or impacts to agricultural operations caused as a result of project construction; micro-siting the towers to avoid agricultural areas, instituting weed control measures; preventing soil erosion; and other measures.⁴² (ODOE - B2HAPPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, pages 389-443 of 614.)

98. In ASC Exhibit K, Attachment K-1, Idaho Power also included an Agricultural Mitigation Plan identifying the measures that Idaho Power will take to avoid, mitigate, repair, and or provide compensation for impacts that may result from the construction or operation of the Project on privately owned agricultural land. Idaho Power committed to working with impacted landowners regarding mitigation measures and compensation for impacts on privately owned agricultural land. Idaho Power explained that the project, taking into account measures to minimize or mitigate impacts, will not force a significant change in, or significantly increase the cost of, accepted farming practices in the areas surrounding the project in Union County. (ODOE - B2HAPPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, pages 247, 389-443 of 614.)

99. In the Proposed Order, the Department reviewed ASC Exhibit K, Attachment K-1, Idaho Power's analysis of the proposed facility's impacts on Goal 3 agricultural lands. The

⁴¹ In his rebuttal testimony, Kurtis Funke summarized these impacts as follows:

[T]emporary impacts to field crops from the transmission line construction; permanent impacts to field crops from transmission line construction; impacts to use of aircraft for farming activities; impacts to field burning; impacts to crop production and irrigation; impacts to livestock operations; impacts to pasture/rangeland; impacts to fencing; impacts to organic farming; impacts to agricultural works; impacts from helicopter operations related to transmission line construction; and impacts to future development, crops, and practices.

(Funke Rebuttal Test. at 14.)

⁴² Of the 1,461 transmission towers along the proposed route, only 26 are proposed to be located within an irrigated portion of an agricultural field, and Idaho Power may be able to further reduce this total number through micrositing. (Funke Rebuttal Test. at 18; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8907 of 10016.)

Department noted that ORS 215.275(5) requires that the reviewing body impose clear and objective conditions of approval on the application to mitigate the impacts of the proposed facility on surrounding lands devoted to farm use to prevent a significant change in accepted farm practices or a significant increase in the cost of farm practices on surrounding farmlands. The Department then reviewed and analyzed Idaho Power's draft Agriculture Assessment and the Agricultural Mitigation Plan (ASC Exhibit K, Attachment K-1).⁴³ To ensure compliance with the Agricultural Lands Assessment, the Department recommended that the Council impose Recommended Land Use Condition 14, as follows:

Recommended Land Use Condition 14: The certificate holder shall:

- a. Prior to construction of any phase or segment of the facility, the certificate holder in accordance with the OAR 345-025-0016 agency consultation process outlined in the draft Agriculture Assessment and Mitigation Plan (Attachment K-1 of the Final Order on the ASC), submit to the Department a final Agricultural Assessment and Mitigation Plan.
- b. During construction and operation of any phase or segment of the facility, implement the Agricultural Mitigation Plan as finalized per sub (a) of this condition.
- c. During operation, implement a post-construction monitoring plan to identify any remaining soil and agricultural impacts associated with construction that require additional restoration or mitigation, in accordance with Section 7.0 of the Agricultural Mitigation Plan, Attachment K-1 of the Final Order on the ASC.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 232 of 10016.)

100. With regard to ASC Exhibit K, Attachment K-2, the Department expressly approved of Idaho Power's methods for assessing potential impacts to forest practices.⁴⁴ The

⁴³ The Department also added provisions to the Agricultural Mitigation Plan, requiring Idaho Power to provide notification to the record owner of any agricultural lands containing high-value farmland, as defined in ORS 195.300(10), of the opportunity to consult with IPC for the purpose of locating and constructing the transmission line in a manner that minimizes impacts to high-value farmland farming operations. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8917 of 10016.)

⁴⁴ The Department noted:

Based on the above-described approach, and record of consultation with Union and Umatilla Planning Departments to accurately identify and account for forest-zoned lands within the analysis area, the Department recommends Council find that the methods are valid for assessing potential impacts to forest practices.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 237 of 10016.)

Department found, in pertinent part, as follows:

Based on the removal of approximately 776 acres of land from timber harvest production, the applicant quantifies the estimated harvest value to then assess potential economic impacts from the proposed facility. Potential impacts to the cost of accepted forest practices is then based on the economic impact of the proposed facility.

* * * * *

[P]otential impacts to the cost of accepted forest practices from the proposed facility include an annual economic revenue loss of \$212,530 and \$94,710 in Union and Umatilla counties, respectively; and, based on the 100 year (or more) estimated useful life of the proposed facility, a long-term loss of \$21.3 million and \$9.5 million in Union and Umatilla counties, respectively. The applicant notes that the actual value of a particular landowner's timber would be valued based on a timber appraisal completed at the time of land acquisition. As further described below, in addition to the land acquisition process, which would provide compensation for the economic loss of timber harvest area, the applicant proposes mitigation measures to minimize potential impacts to, and the cost of, accepted forest practices. To evaluate the significance of the removal of land from timber harvest potential, the applicant assesses the quantity of forest land lost compared to total forest land available (in acres), per county, resulting in approximately 0.07 and 0.4 percent loss in Union and Umatilla counties, respectively.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 238-40 of 10016.)

101. The Department also noted:

In addition, the applicant would compensate underlying landowners for the loss of land and timber production opportunity, for the life of the facility, based on a certified appraisal of the land value. Compensation would be implemented via private easement agreement or through negotiated settlement. Because this would occur during landowner negotiation or condemnation proceedings under the Oregon Public Utilities Commission, it is not specifically imposed as a site certificate condition or mitigation plan requirement. The Department recommends, however, that Council consider these processes, which would be outside of EFSC jurisdiction, to also provide mitigation consistent with OAR 345-010-0010(33) and would reduce potential impacts to accepted forest practices.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 242 of 10016.)

102. The Department addressed the proposed mitigation for potential impacts to

accepted forest practices. The Department recommended that the Council impose Recommended Land Use Condition 16, requiring implementation of the draft Right-of-Way Clearing Assessment:

Recommended Land Use Condition 16: The certificate holder shall:

- a. Prior to construction, in accordance with the OAR 345-025-0016 agency consultation process outlined in the draft Right-of-Way Clearing Assessment (Attachment K-2 of the Final Order on the ASC), submit to the Department for its approval, a final Right-of-Way Clearing Assessment. The protective measures described in the draft Right-of-Way Clearing Assessment in Attachment K-2 of the Final Order on ASC shall be included and implemented as part of the final Right-of-Way Clearing Assessment, unless otherwise approved by the Department.
- b. During construction, the certificate holder shall conduct all work in compliance with the final Right-of-Way Clearing Assessment.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 242 of 10016.)

103. The Department further found:

In addition, the applicant would compensate underlying landowners for the loss of land and timber production opportunity, for the life of the facility, based on a certified appraisal of the land value. Compensation would be implemented via private easement agreement or through negotiated settlement. Because this would occur during landowner negotiation or condemnation proceedings under the Oregon Public Utilities Commission, it is not specifically imposed as a site certificate condition or mitigation plan requirement. The Department recommends, however, that Council consider these processes, which would be outside of EFSC jurisdiction, to also provide mitigation consistent with OAR 345-010-0010(33) and would reduce potential impacts to accepted forest practices.

Based on the evaluation presented in ASC Exhibit K and reasoning and analysis presented in this order, and compliance with recommended Land Use Condition 16, the Department recommends Council find that the proposed facility would not result in significant adverse impacts to accepted forest practices nor result in a significant increase in the cost of accepted forest practices within the surrounding area and therefore would satisfy the requirements of OAR 660-006-0025(5)(a).

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 242 of 10016.)

104. With regard to the project's compliance with Statewide Planning Goal 3, Agricultural Lands, the Department found:

Goal 3 is implemented through applicable provisions of ORS Chapter 215 and each county's comprehensive plan and land use ordinances. As demonstrated above the proposed transmission line is allowed as a 'utility necessary for public service' on EFU-zoned lands under ORS 215.283(1)(c)(A) and ORS 215.275. As discussed above, and in compliance with ORS 215.275, the applicant's Agricultural Lands Assessment (ASC Exhibit K, Attachment K-1) demonstrates that the certificate holder would minimize impacts to accepted farming practices, and mitigate temporary and permanent impacts where necessary, in order to preserve and maintain agricultural lands consistent with the statutory framework developed to comply with Goal 3.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 246-47 of 10016.)

105. With regard to the project's compliance with Statewide Planning Goal 4, Forest Lands, the Department found:

[M]ost of the forest lands impacted by the proposed transmission line are in Umatilla and Union counties, where it would be conditionally permitted as a "new electric transmission line." As discussed above, the department recommends that the Council accept the applicant's interpretation that the term "new electric transmission line" includes all related and supporting facilities, including access roads. Based on that interpretation, the proposed transmission line and each of its related and supporting facilities are conditionally permitted in Goal 4 forest lands under OAR 660-006-0025(4)(q).

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 247 of 10016.)

106. With regard to the economic consequences of the proposed facility on Land Use concerns, the Department found:

Under the Council's Land Use standard, in order for the Council to grant a Goal 4 exception, the Council must find that the applicant has demonstrated that economic consequences of the proposed facility have been identified and mitigated in accordance with Council standards. The applicant indicates that construction and operation of the transmission line would result in the conversion of approximately 245.6 acre of forestland in Umatilla County and approximately 530.1 acres of forestland in Union County. These losses correspond to approximately [0.034] percent and [0.059] percent of total forestland within the counties, respectively. Additionally, the applicant estimates that the conversion of the above-described forestland would result in an "economic impact to forest sector jobs" in the amount of \$120,000 in Umatilla County and \$97,000 in Union County. The Department interprets "economic impacts" as "opportunity costs" to forestry industry due to land loss; the ASC does not appear to provide a specific

dollar estimate of the value of the land itself. The applicant also indicates that the project would provide economic benefits to the greater Pacific Northwest region, and would create direct economic benefits to the local communities through job creation, increased ad valorem taxes, and local spending stimulus.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 257-58 of 10016.)

107. With regard to Statewide Planning Goal 8 (Recreation Needs), the Department noted that while the proposed facility is not intended to satisfy recreational needs, compliance with the Council's Recreation standard ensures that the proposed facility will not adversely impact the state's recreational needs. As pertaining specifically to Morgan Lake Park (an important recreational opportunity in the project's analysis area under the Recreation standard), the Department referenced Idaho Power's Memorandum of Agreement (MOA) with the City of La Grande to distribute \$100,000 for recreational improvements to the park if Idaho Power selects the Morgan Lake Alternative route. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 250 of 10016.) The MOA contemplates that the funds would be used for upgrades to the park access road, a new entry gate, new toilets, day use area improvements, and signage. (*Id.*) The Proposed Order further states as follows:

Because the applicant's commitments described MOA, if executed, with the City of La Grande is part of the evidence Council could rely on to determine that the proposed facility would be consistent with Goal 8, the Department recommends Council impose the following condition:

Recommended Land Use Condition 17: Within 90-days of construction within Union County, if the Morgan Lake alternative route segment is selected at final facility design, the certificate holder shall provide the Department a copy of the Memorandum of Agreement, if executed, between the City of La Grande and certificate holder for improvements at Morgan Lake Park.

(*Id.* page 251 of 10016.)

108. With regard to compliance with the Land Use standard, the Department concluded:

Based on the foregoing findings and the evidence in the record, and subject to compliance with the recommended conditions, the Department recommends the Council find that the proposed facility, including the proposed and alternative routes, complies with the identified applicable substantive criteria and the directly applicable state statutes and rules and, therefore, complies with the Council's Land Use standard.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 260 of 10016.)

109. Limited party Gilbert raised concerns that Idaho Power did not provide sufficient

objective information on impacts the proposed facility may have on accepted farm practices, such as impacts from permanent project components, potential interference with pivotal irrigation systems, potential impacts from induced current, limiting the ability to use aircraft for farming activities, and impacts to soil and soil erosion. However, Idaho Power addressed these concerns and potential impacts in the Agricultural Lands Assessment and explained the actions the Company will take to avoid, minimize, mitigate, or compensate for these impacts. (Funke Rebuttal Test. at .52-66; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 8897-8925 of 10016.)

110. Limited party Sam Myers is a farmer with a lifetime lease on dryland farm ground in Morrow County, Oregon. The proposed facility crosses Mr. Myers' farmland. Mr. Myers raised concerns about the risks of project-related fires and the impacts a wildfire would have on his cropland. Mr. Myers also raised concerns about the project's impacts on his ability to use aerial chemical applications. (Myers Direct Test. at 1-5.) Idaho Power has addressed the risks of project-related wildfire through its Fire Prevention and Suppression Plan, Wildfire Mitigation Plan, its Public Safety Power Shutoff Plan, and Recommended Public Services Conditions 6 and 7. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 590 of 10016; Dockter Test., Cross-Exam. Hearing Day 3 (Tr. Day 3) at 21-23.) Idaho Power also addressed impacts to a landowner's ability to use aerial applications and the proposed mitigation for those impacts in its Agricultural Lands Assessment, Section 7.0. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8916 of 10016.)

111. If a fire occurred near Mr. Myers' agricultural operations, the fuel source would be mostly herbaceous, grass and grain vegetation. The timing of the fire will determine the fire conditions. The most likely time of year for a fire to move through this property is later in the growing season, when fuel sources are quite dry. This may result in a high intensity fire, but the fire would likely move quickly through the fields due to the presence of higher winds in that area. A fast-moving fire would not cause significant damage to soils. Moreover, a fast-moving fire may have other benefits to the burned area including reduction of viable weed seeds and reduction of disease and insect and rodent incidence. Burning also releases nitrogen, potassium, phosphorus and other nutrients from undecomposed organic matter to the soil. (Madison Rebuttal Test. at 91-92; Madison Rebuttal Exs. M and N.)

Findings related to the Noise Control Rules

112. The DEQ's Noise Control rules were first promulgated in 1974 to implement the provisions of ORS Chapter 467. The DEQ's rules, OAR Chapter 340, Division 35, established standards, provided for exceptions and variances to those standards, and provided for enforcement of the standards. In July 1991, upon legislative approval, the DEQ terminated the Noise Control Program as an agency cost savings measure due to reductions in General Fund support. (Rowe Decl., Attachment 1.) Although the DEQ terminated its Noise Control Program, the statutes and administrative rules remain in force. Now, enforcement of the noise standards falls under the responsibility of local governments and, in some cases, other agencies. The Department and Council must ensure that proposed energy facilities meet the DEQ's noise control regulations. (*Id.*)

113. No Council standard specifically addresses facility-related noise, although as noted above, the Council must ensure that the proposed facility meets the DEQ's rules. Accordingly, OAR 345-021-0010(1)(x) requires that, in the ASC, the applicant provide information about noise generated by facility construction and operation and evidence to support a finding by the Council that the facility complies with the noise control standards in OAR 340-035-0035.

114. In the Second Amended Project Order, the Department modified the requirements of OAR 345-021-0010(1)(x)(E) to accommodate the linear nature of the proposed facility. The Department ordered as follows: "Instead of one mile, to comply with paragraph E, the applicant must develop a list of all owners of noise sensitive property, as defined in OAR 340-035-0015, within one-half mile of the proposed site boundary." (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 23 of 29.) The Department directed Idaho Power to provide a noise analysis and information to support a finding that the proposed facility "will comply with the requirements of OAR 340-035-0035, or that an exception or variance may be issued by Council." (*Id.*)

115. In ASC Exhibit X, Idaho Power set out its analysis of the potential noise impacts from the B2II Project. ASC Exhibit X identified the noise sensitive receptors (NSRs)⁴⁵ within one-half mile of the project's site boundary from noise-generating features such as the transmission line and provided information to demonstrate that the relevant proposed facility noise sources will not exceed the DEQ's maximum permissible sound levels.⁴⁶ Idaho Power also provided information to show that, for the majority of NSRs within the analysis area, the project will not exceed the DEQ's ambient antidegradation standard.⁴⁷ Idaho Power noted that infrequently, during foul weather conditions, the transmission line might exceed the ambient antidegradation standard. Consequently, in ASC Exhibit X, Idaho Power requested that the Council authorize an exception to the proposed facility's compliance with the ambient antidegradation standard because such exceedances would be infrequent events.⁴⁸ (ODOE - B2HAPPDoc3-41 ASC 24_ Exhibit X_Noise_ASC 2018-09-28, pages 5-65 of 371.)

⁴⁵ A NSR is the same thing as a "Noise Sensitive Property." (Bastach Rebuttal Test. at 7.) The DEQ rules define "Noise Sensitive Property" as "real property normally used for sleeping, or normally used as schools, churches, hospitals or public libraries. Property used in industrial or agricultural activities is not Noise Sensitive Property unless it meets the above criteria in more than an incidental manner." OAR 340-045-0015(38).

⁴⁶ The maximum level for new industry and commerce sources located on a previously unused site is L₅₀ – 50 dBA. OAR 340-035-0035, Table 8.

⁴⁷ The ambient antidegradation standard is set out in OAR 340-035-0035(1)(b)(B)(i). The standard limits the amount by which a new facility can increase sound levels from a baseline ambient level by more than 10 dBA in any one hour.

⁴⁸ OAR 340-035-0035 (Noise Control Regulations for Industry and Commerce) states in part:

(6) Exceptions: Upon written request from the owner or controller of an industrial or commercial noise source, the Department may authorize exceptions to section (1) of this rule, pursuant to rule 340-035-0010, for:

116. In ASC Exhibit X, Idaho Power also described its multi-step methodology for conducting its acoustic analysis of the project. Idaho Power used the methodology to measure the operational noise from the proposed facility, the ambient baseline sound levels at the NSRs, and the frequency of foul weather conditions likely to cause noise exceedances at the NSRs:

In Step 1, Idaho Power identified the NSRs within the analysis area.

In Step 2, Idaho Power determined sound source characteristics for noise modeling of the transmission line during foul weather conditions.

In Step 3, Idaho Power calculated initial screening-level modeling results based on the foul weather conditions, and assessed the likely maximum received sound at the NSRs within the modeling analysis area.

In Step 4, for those NSRs that showed a potential exceedance condition of the 30dBA threshold, Idaho Power conducted baseline sound measurements at or near those locations.

In Step 5, from these baseline measurements, Idaho Power calculated the representative existing L_{50} sound levels and defined new compliance thresholds to assess conformance with the ambient antidegradation standard. Idaho Power calculated the representative existing L_{50} sound levels (baseline ambient noise levels) by taking the average of the measured L_{50} sound levels for the late night time period (12:00 a.m. to 5:00 a.m.).

In Step 6, Idaho Power assigned the L_{50} sound level for each NSR based on measurements performed in Step 5 for monitoring positions in a similar acoustic environment. Then, Idaho Power assessed the ambient antidegradation standard for each NSR. Idaho Power compared the assigned ambient baseline sound level to the modeled future level to assess compliance with the ambient degradation standard.

(ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, pages 9-10 of 371; *see also* Bastasch Rebuttal Test. at 16-18.)

117. As set out in ASC Exhibit X, to determine the frequency of foul weather conditions that may cause corona noise⁴⁹ exceedances at the NSRs, Idaho Power relied on historic weather data to predict the frequency of foul weather events at the NSR location. Idaho Power considered the variability of meteorological conditions on an hourly basis throughout the entire

(a) Unusual and/or infrequent events[.]

⁴⁹ Corona sound is usually heard as a hissing or crackling sound accompanied by a low hum and is a function of transmission line voltage, altitude, conductor and weather. (Bastasch Rebuttal Test. at 13.)

year.⁵⁰ (ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 12 of 371.) Based on this meteorological data, Idaho Power determined that foul weather conditions expected to cause noise exceedances would occur approximately 1.3 percent of the time throughout the year.⁵¹ (*Id.* at page 28 of 371.) In the ASC, Idaho Power asserted that because the potential exceedances are anticipated to occur only approximately 1 percent of the time, the exceedances should be considered infrequent events for purposes of the exception to the standard. (*Id.* at page 31 of 371.).

118. For Step 4 of the acoustical analysis, Idaho Power designed and implemented its own sound monitoring program instead of using what it considered to be the outdated measurement procedures set out in DEQ Manual.⁵² Idaho Power adopted a methodology that is more sophisticated and more conservative than the DEQ Manual in terms of establishing the project's sound impact. The Company developed its sound monitoring protocol in consultation with the Department. Both the Department and its consultants vetted and approved of the protocol. (Bastash Rebuttal Test. at 20-21.) In the ASC, Idaho Power's sound analysis relies on data from 17 monitoring positions. When multiple monitoring positions were in proximity to NSRs, the Company selected the monitoring position with the lower ambient sound level to provide more conservative representative ambient sound levels. The Company also selected monitoring positions that were generally located further from existing ambient sound sources

⁵⁰ ASC Exhibit X, Section 3.2.4, Evaluating Frequency of Foul Weather Conditions, states in pertinent part:

To determine the frequency of foul weather conditions in the analysis area, an analysis of the historical meteorological data (2008-12) was conducted at four discrete data collection stations found in proximity to the Project: Flagstaff Hill, La Grande, Owyhee Ridge, and Umatilla National Wildlife Refuge (NWR). Verified meteorological data were obtained for these stations from the Western Regional Climate Center (WRCC). The WRCC is one of six regional climate centers in the United States and provides meteorological monitoring data for the Pacific Northwest region. * * * .

The hourly meteorological data included parameters such as precipitation, wind speed (mph), wind direction (degree), average air temperature (degrees Fahrenheit), relative humidity (percent), and solar radiation (watts per square meter). The data were analyzed to effectively determine the frequency of relevant foul weather conditions in the vicinity of potentially impacted NSRs.

(ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 12 of 371.)

⁵¹ ASC Exhibit X, Table X-6 shows meteorological data analyses in terms of frequency. Table X-7 lists the seasonal and diurnal (day, night, and late night) variability in foul weather for the project area. Table X-8 shows the daily and hourly frequency of foul weather and Table X-9 shows the late night frequency of foul weather. (ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, pages 28-31 of 371.)

⁵² OAR 340-035-0035(3)(a) requires that sound measurement procedures conform to "the procedures which are adopted in the Sound Measurement Procedures Manual (NPCS-1), or to such other procedures as are approved in writing by the Department."

than the NSRs, further contributing to the conservative nature of the baseline ambient sound measurements. (*Id.* at 22.)

119. Idaho Power collected sound measurements at each monitoring position continuously over a two to four-week duration. The initial measurement period began on March 6, 2012 and ended on May 10, 2012. A supplemental measurement period began on March 11, 2013 and ended on June 12, 2013. Idaho Power extended the duration of the measurement period to obtain a statistically significant dataset and to obtain data during a range of meteorological conditions. (Bastasch Rebuttal Test. at 24.)

120. The results of Idaho Power's noise analysis demonstrated that the project complies with the noise rules' upper limits on sound levels ($L_{50} - 50$ dBA), but that in some instances, the corona sound caused by foul weather will result in an exceedance of the ambient antidegradation standard set out in OAR 340-035-0035 (more than 10 dBA in any one hour). (OAR 340-035-0035(1)(b)(B)(i); Bastasch Rebuttal Test. at 4.)

121. In the Proposed Order, Section IV.Q.1, Noise Control Regulation, the Department found that the project would be a new industrial noise source and therefore the requirements established in OAR 340-035-0035(1)(b)(B)(i) are applicable. The Department addressed construction noise and predicted noise levels from general construction activities and operational noise, including the potential corona noise generated from the proposed transmission line and operations and maintenance activities. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 626 of 10016.)

122. The Department expressly approved Idaho Power's sound measurement procedure, stating in part as follows:

Sound measurements at each monitoring position were collected continuously over a 2- to 4- week duration. The initial measurement period commenced March 6, 2012, and ended on May 10, 2012, and the supplemental measurement period commenced March 11, 2013 and ended on June 12, 2013.

The Department relied upon its third-party consultant, Golder Associates, to review the protocol. Based on review, Golder Associates confirmed that the sound measurement procedures and baseline noise measurements were technically accurate. Based on the Department's third-party consultant recommendations and review, and review of facts represented in ASC Exhibit X, the Department recommends Council approve the applicant's sound monitoring points and measurement procedures, as allowed under OAR 340-035-9 0035(3)(a) and (b).

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 634-635 of 10016.)

123. In the Proposed Order, the Department also addressed Idaho Power's request for an exception to the ambient antidegradation standard based on the expected infrequency of potential

exceedances.⁵³ (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 649-52 of 10016.) In doing so, the Department reviewed Idaho Power's methodology for predicting the frequency of foul weather conditions and the analysis of foul weather frequency. The Department noted:

To predict the frequency of foul weather conditions in the analysis area, the applicant evaluated hourly meteorological data, from 2008-2012, including precipitation, wind speed, wind direction, average air temperature, relative humidity, and solar radiation from the following four Western Regional Climate Center (WRCC) meteorological stations - Flagstaff Hill, La Grande, Owyhee Ridge, and Umatilla Northwest Wildlife Refuge. In ASC Exhibit X, the applicant utilized the meteorological datasets for each WRCC station to ascertain diurnal and seasonal variations in weather conditions. Additionally, the applicant identified periods of rainfall events over the course of consecutive days and consecutive hours to inform their definition of infrequent. The applicant averaged the data from the meteorological stations and found that foul weather (i.e. weather conditions comprised of a rain rate of 0.8 to five millimeters per hour [mm/hr]) occurred for at least one hour during 13 percent of the days (or approximately 48 days per year).

The applicant conducted a sensitivity analysis during the late night time period and provided the results in ASC Exhibit X, Table X-9. Based on historic average rainfall conditions measured at the 4 WRCC meteorological stations, the frequency of foul weather conditions lasting one hour or more ranges from 22 to 80 days per year, with foul weather occurring in the late night hours (for a period of one hour or more), between two and seven percent of the time.

The Department utilized a third-party consultant, Golder Associates, to support technical review of the exception request, specifically the accuracy of weather data relied upon and applicant's evaluation of foul weather frequency. The Department's consultant utilized a trained meteorologist for the evaluation and determined the meteorological data to be complete and accurate, and the assumed rain rate of 0.8 to 55 mm/hr used in the acoustic modeling, based on the meteorological data, to be conservative for a predominately arid region. Based on its review, the consultant recommended the Department consider that, because the

⁵³ OAR 340-035-0010, titled "Exceptions" states as follows:

(1) Upon written request from the owner or controller of a noise source, the Department may authorize exceptions as specifically listed in these rules.

(2) In establishing exceptions, the Department shall consider the protection of health, safety, and welfare of Oregon citizens as well as the feasibility and cost of noise abatement; the past, present, and future patterns of land use; the relative timing of land use changes; and other legal constraints. For those exceptions which it authorizes the Department shall specify the times during which the noise rules can be exceeded and the quantity and quality of the noise generated, and when appropriate shall specify the increments of progress of the noise source toward meeting the noise rules.

applicant applied a higher than average rain rate, the likelihood of ambient antidegradation standard exceedance could reasonably be limited to infrequent or unusual events.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 651 of 10016.)

124. Next, the Department addressed the meaning of the phrase “infrequent or unusual” for purposes of the Noise Control rules:

The phrase “infrequent or unusual” is not defined in DEQ’s statutes (ORS 467.030) or noise rules. Therefore, to resolve ambiguity, the Department considers it necessary to interpret the phrase based on the regulatory interpretation methodology described in *PGE v. Bureau of Labor 28 and Industries*, 317 Or 606, 610-12 (1993) and modified in *State v. Gaines*, 346 Or 160 (2009) (“*Gaines*”). Consistent with the methodology, the Department considers the text and context of the phrase within the rule, and applies the general maxims of regulatory language construction to support its interpretation. The relevant dictionary definition of “infrequent” and “unusual” is: “occurring at wide intervals in time,” and “uncommon” or “rare.” The definition includes the concept that the circumstances are not constant, not continuous, and not representative of normal operating conditions.

Having considered the text of the rule, the Department considers the contextual rule provisions under OAR 340-035-0005 which states that the underlying policy of the noise rules is to protect the health, safety and welfare of Oregon citizens from the hazards and deterioration of the quality of life imposed by excessive noise emissions. Given that the -0005 policy is to protect citizens from excessive noise emissions which, under typical meteorological conditions for the region, is not expected from the proposed facility, it appears contrary not to consider foul weather events – the contributing factors of excessive noise emissions – unusual or infrequent under OAR 340-035-0035(6)(a). Therefore, based on the Department’s review, technical review and recommendations of its third-party consultant, Golder Associates, and the analysis presented above, the Department recommends Council find that exceedances of the ambient antidegradation standard during foul weather events would be infrequent or unusual under OAR 340-035-0035(6)(a) and that Council grant an exception to the proposed facility.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 651-52 of 10016.)

125. As further evidence to support the conclusion that corona sound caused by foul weather would be an infrequent occurrence along the proposed facility, Idaho Power presented an internal Bonneville Power Administration (BPA) memorandum dated May 26, 1982 that discusses sound level limits for BPA facilities. The BPA memorandum (Proposed Order Attachment 5) notes that BPA consulted with the Oregon DEQ and the Washington State

Department of Ecology regarding state and local noise control regulations. The memorandum explains that, based on BPA's meteorological assessment of weather east of the Cascades, corona sound caused by foul weather conditions east of the Cascades would be, by definition, "infrequent" and therefore the transmission line would be eligible for an exception to the states' noise rules.⁵⁴ (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7879 of 10016.)

126. Idaho Power also presented evidence of BPA's transmission line noise studies for other transmission line projects where BPA focused on the infrequent occurrence of foul weather in the project vicinity. BPA's meteorological analysis showed that foul weather would occur between one and seven percent of the year, depending on the project location. (Bastasch Rebuttal Test. at 33-34; *see also* ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7904-05 of 10016.)

127. Idaho Power's approach to estimating potential exceedances of the ambient antidegradation standard is intentionally conservative and, for that reason, likely overestimates the frequency of actual exceedances. For example, Idaho Power estimated the level of corona sound modeling that would be produced if the facility were operating at the maximum operational voltage of 500 kV. However, during typical operations the line will be operating at a substantially lower voltage. Moreover, the Company's modeling assumed that exceedances would occur during any foul weather event, day or night, but the actual exceedances are anticipated to occur only during periods where ambient sound levels are lowest, typically during the late night hours. Additionally, Idaho Power's modeling did not consider the masking phenomenon, *i.e.*, the sound of heavy rain hitting foliage, which tends to increase the actual ambient sound levels during foul weather. Finally, Idaho Power's modeling removed from the calculation any hour in which wind was greater than 10 mph. Because wind can increase ambient sound levels, removing the hours in which the wind was more than 10 mph also tends to result in a lower assumed ambient sound level than actual conditions. (Bastasch Rebuttal Test. at 29-36.)

128. In essence, exceedances of the ambient antidegradation standard due to facility-related noise would be infrequent because three conditions need to coincide to result in an exceedance: (1) a low ambient noise environment (generally late night or early morning hours and low wind); (2) foul weather (rain or high humidity); and (3) the transmission line operating at or near maximum voltage. (Miller Cross-Exam. Test, Tr. Day 1 at 30-31; *see also* Bastasch Rebuttal Test. at 31.)

⁵⁴ The memorandum explains:

It is BPA's interpretation that a frequency of occurrence of less than 1 percent will qualify as an exception to the regulations. For [alternating current] transmission lines located in areas where a rain rate from 0.8 to 5mm/hr will occur less than one percent of the time during the year, audible noise from the line will be an infrequent event and thus be considered as an exception from noise regulations. Based on a meteorological analysis of the frequency of these rain rates (0.8 to 5mm/hr) [alternating current] transmission lines east of the Cascades will meet this criteria.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7879 of 10016.)

129. At Idaho Power's request, the Department also considered whether granting an exception to the DEQ's ambient antidegradation standard would allow for the protection of health, safety, and welfare of Oregon citizens pursuant to OAR 340-035-0010(2). The Department found that potential exceedances of the ambient antidegradation standard along the proposed transmission line and at 41 NSR locations "would be infrequent, estimated under worse-case conditions anticipated to occur two to seven percent of the time." (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 652 of 10016.) The Department added:

[A]ctual noise-related impacts are anticipated to be minimal as residents are assumed to be indoors at the time of the exceedance during late night and very early mornings (12:00 a.m. to 5:00 a.m.) and during foul weather (*i.e.* when it is raining). Therefore, it is expected that NSRs would experience noise levels inside their houses 10 dBA (with windows open) to 20 dBA (with windows closed) lower than modeled in ASC Exhibit X due to noise attenuation and absorption by residential structures.

As represented in ASC Exhibit X, the applicant also commits to working with impacted NSRs to attempt to resolve concerns, avoid, monitor, and mitigate noise at NSRs caused by audible corona noise and potential exceedances. The mitigation plan may include micrositing the relevant portions of the proposed transmission line within the site boundary; however, the applicant reiterates that the micrositing may not affect other landowners, unless agreed-to in writing by those other landowners. Other mitigation measures include, but are not limited to the installation of, or cash equivalent of, certain window treatments shown to be effective in reducing indoor sound pressure levels. Further, the applicant represents that it would establish a system to receive and respond to complaints associated with potential operational corona noise from landowners not identified in Attachment X-5 of this order. The complaint response plan includes a process for complaint filing, receipt, review and response for NSR exceedances evaluated in the ASC and NSRs that are not identified in the ASC.

(*Id.* at pages 652-53 of 10016.)

130. The Department recommended that the Council impose conditions related to Idaho Power's proposed noise exceedance mitigation plans and complaint response plan. The conditions are designed to ensure that granting an exception to the proposed facility would not preclude the protection of public health, safety, and welfare otherwise afforded through compliance with DEQ's noise control rules. Recommended Noise Control Condition 1 in the Proposed Order requires Idaho Power to work with the 41 NSR property owners identified in Attachment X-5 to develop mutually agreed upon Noise Exceedance Mitigation Plans, specific to each NSR location. The site-specific Noise Exceedance Mitigation Plans will include agreed upon measures to be implemented at the NSR location to minimize or mitigate the ambient antidegradation standard noise exceedance. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 653-54 of 10016.)

131. Recommended Noise Control Condition 2 in the Proposed Order requires Idaho Power to develop and implement a complaint response plan to address noise complaints and requires that the plan include certain provisions, including the process for complaint filing, receipt, review and response. The recommended condition also requires Idaho Power to notify the Department within three working days of receipt of a project-related noise complaint, describes the process for determining if corona noise exceeds the ambient antidegradation standard, and describes the process for developing a plan to minimize or mitigate project-related exceedances of the ambient antidegradation standard. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 655 of 10016.)

132. At Idaho Power's request, the Department also considered whether granting an exception to DEQ's ambient antidegradation standard is appropriate in light of the feasibility and cost of noise abatement.⁵⁵ The Department noted that typical noise abatement technologies, such as insulators, silencers, and shields, are not reasonable technologies for transmission lines due to the line's length as well as safety and operational limitations. To ensure that Idaho Power constructs the proposed transmission line using materials to reduce corona noise, the Department recommended that the Council impose Recommended Noise Control Condition 3, requiring Idaho Power to implement design measures and construction techniques to minimize potential corona noise during facility operation. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 656 of 10016.)

133. In its discussion of granting an exception to the noise rules, the Department explained that because foul weather conditions may occur at any point during the day or night, at any point along the proposed transmission line, and because the proposed transmission line would operate 24 hours a day, year-round, placing time limitations on the exception would not be appropriate. The Department recommended that the Council establish that the ambient antidegradation standard may be exceeded at any time during infrequent or unusual foul weather events, as authorized through the OAR 340-035-0035(6)(a) exception. The Department also recommended imposing the following condition, describing the exception:

Recommended Noise Control Condition 4: During operation:

- a. An exception to compliance with the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) (i.e. an increase of 10 dBA above ambient sound pressure levels) is granted for infrequent or unusual foul weather events during facility operation, pursuant to OAR 340-035-0035(6)(a).
- b. The ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) may be exceeded by the transmission line any time of day or night during infrequent or unusual foul weather events. [OAR 340-035-0010(2)]
- c. The quantity and quality of noise generated in exceedance of the ambient

⁵⁵ As noted above, OAR 340-035-0010(2) identifies "the feasibility and cost of noise abatement; the past, present, and future patterns of land use; the relative timing of land use changes; and other legal constraints" as other factors to consider in establishing exceptions to the noise rules.

antidegradation standard (ambient plus 10 dBA) at OAR 340-035-0035(1)(b)(B), during infrequent or unusual foul weather events, shall not be more than 10 dBA (or ambient plus 20 dBA), as measured at any NSR location, and from corona noise consisting of a low hum and hissing, frying or crackling sound, respectively. [OAR 340-035-0010(2)]

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 662 of 10016.)

134. In the Proposed Order, the Department also addressed Idaho Power's request for a variance under OAR 340-035-0100.⁵⁶ The Department recommended that the Council evaluate the variance request for the entirety of the transmission line alignment based on its interpretation that the ambient antidegradation standard under OAR 340-035-0035(1)(b)(B)(i) applies to the transmission line. Based on its evaluation of the variance criteria, the Department recommended that the Council impose Recommended Noise Control Condition 5, granting a variance to compliance with the ambient antidegradation standard pursuant to OAR 340-035-0100(1) for the transmission line and allowing the project to exceed the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) at any time of day or night. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 666 of 10016.)

135. In the Proposed Order, the Department found as follows with regard to the proposed facility's compliance with the Noise Control Rules:

Based on the foregoing findings and conclusions of law, and subject to compliance with the recommended site certificate conditions, the Department recommends that the Council find that an OAR 340-035-0035(6)(a) exception (unusual or infrequent events) and variance to compliance with the ambient antidegradation standard (OAR 340-035-0035(1)(b)(B)(i)) be granted for the proposed facility and that the proposed facility, including the proposed and alternative routes, would otherwise comply with the Noise Control Regulations in OAR 340-035-0035(1)(b)(B).

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 666-67 of

⁵⁶ OAR 340-035-0100(1) states:

Conditions for Granting. The Commission may grant specific variances from the particular requirements of any rule, regulation, or order to such specific persons or class of persons or such specific noise source upon such conditions as it may deem necessary to protect the public health and welfare, if it finds that strict compliance with such rule, regulation, or order is inappropriate because of conditions beyond the control of the persons granted such variance or because of special circumstances which would render strict compliance unreasonable, or *impractical due to special physical conditions or cause*, or because strict compliance would result in substantial curtailment or closing down of a business, plant, or operation, or because no other alternative facility or method of handling is yet available. Such variances may be limited in time.

(Emphasis added.)

10016.)

136. In addition to minimizing corona sound through the construction design required by Recommended Noise Control Site Condition 1, Idaho Power proposes to mitigate exceedances in other ways. First, Idaho Power will microsite the project components within the site boundary to increase the distance between the NSR and the transmission line where feasible and agreed-to with the landowner. Second, the Company plans to offer to retrofit those residences where the exceedances are expected with new windows designed to improve the sound insulation. The Company commits to working with a qualified acoustical consultant and the affected NSR owner to implement acoustical upgrades. (Bastasch Rebuttal Test. at 52-53.)

137. In ASC Exhibit X, Idaho Power used monitoring position (MP) 11 as representative of the NSRs along the proposed route in Union County. MP 11 was located at a cabin approximately 5 miles south of Meacham, Oregon, along Segment 3 (Union County). MP 11 was approximately 1.1 miles from Interstate 84, and approximately 207 feet from the Union Pacific Railroad line. The nearest existing transmission line is approximately one half mile, and is owned by BPA. In the ASC, Idaho Power provided the following description of conditions at MP 11:

Daytime field observations noted 8 to 10 heavy trucks (some with snowplows) that passed the meter within one hour. Snowplows passing by the meter were measured at approximately 80 dBA. Freight train traffic was present on the Union Pacific Railroad situated immediately adjacent to the property. Nighttime field observations noted generally quiet conditions with no traffic, sounds of water running in a creek, light snow/rain showers, and light winds.

(ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 160 of 371.) Idaho Power's measurement of existing sound levels at MP 11 (for the period of March 7, 2012 to April 6, 2012) at late night and low wind conditions disclosed a baseline ambient noise level of 32 dBA (L₅₀ one hour). (*Id.* at 22 of 371.) Idaho Power used the 32 dBA baseline value to assess the potential for exceedances at identified NSRs near Morgan Lake in Union County. (*Id.*)

138. Limited parties raised concerns with Idaho Power's choice to use MP 11 to set the baseline ambient sound level for all NSRs along the Morgan Lake Alternative. In support of their challenge, limited parties presented evidence from acoustical engineer Kerrie Standlee who, over the course of several hours on the morning of September 12, 2021, measured the ambient noise level from a residence on Morgan Lake Road owned by limited party Greg Larkin. Mr. Standlee measured the hourly L₅₀ noise level between 12:25 a.m. and 4:00 a.m., in calm wind conditions, 48 to 50 degree temperature, and 73 percent relative humidity. On that date, during that three and a half hour period, the ambient sound measurements ranged from a high of 29 dBA (between 12:25 a.m. and 1:00 a.m.) to a low of 20 dBA (between 3:00 a.m. and 4:00 a.m.). Based on this sample, Mr. Standlee opined that: (1) the ambient noise at residences in the vicinity of Morgan Lake is likely 10 to 12 dB lower than the level used in Idaho Power's noise analysis; and (2) the ambient noise level measured at MP 11 (32 dBA) is not representative of the ambient noise levels at residences in the vicinity of Morgan Lake. (STOP B2H Ex. 5 at 4.)

139. In response to limited parties' concerns that Idaho Power did not adequately assess baseline noise levels at NSRs in the area of Morgan Lake, the Company's consultant performed supplemental sound monitoring at four additional locations near the NSRs (MPs 100, 101, 102 and 103) over 21 days, from October 10 to November 1, 2021. MP 100 was located on private property immediately adjacent to Morgan Lake Park; MP 101 was located off Wood Road, downslope from the residences; MP 102 was located along Morgan Lake Road, on a bluff overlooking La Grande; and MP 103 was established to represent the NSRs in the La Grande valley closer to I-84. (Bastasch Rebuttal Test. at 63-65.)

140. Measured when winds gusts were less than 10 miles per hour, with no rain and relative humidity less than 90 percent, the average L_{50} during the period of midnight to 5:00 a.m. at these four monitoring positions were as follows:⁵⁷

MP 100 – 31 dBA
MP 101 – 36 dBA
MP 102 – 32 dBA
MP 103 – 43 dBA

(Bastasch Sur-surrebuttal Test Ex. I; Bastasch Cross-Exam. Test., Tr. Day 1 at 58-60.)

141. Overall, the results of Idaho Power's supplemental monitoring confirmed that the Company's decision to use 32 dBA as the ambient baseline level for MP 11 (representing the ambient noise level at NSRs in the Morgan Lake area) was appropriate. (Bastasch Cross-Exam. Test., Tr. Day 1 at 64-65.) The one decibel difference (between the 31 dBA baseline level recorded at MP 100 and the 32 dBA at MP 11) is not perceivable to the human ear. (*Id.* at 65.)

Findings related to the Public Services standard – Traffic Safety

142. Pursuant to OAR 345-021-0010(1)(u), ASC Exhibit U must include information regarding potential adverse impacts on public services, including traffic safety, and evidence to support a finding by Council that the project complies with the Public Services Standard. In the Second Amended Project Order, the Department directed Idaho Power to provide estimated facility-related traffic during construction and operation and the potential impact on traffic safety. The Department also directed Idaho Power to describe the "proposed transportation routes for the transport of heavy equipment and shipments of facility components during construction, including proposed ground and air transportation routes within the analysis area."⁵⁸ (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 22 of 29.)

⁵⁷ These are the corrected L_{50} values set out in Bastasch Sur-surrebuttal Exhibit I and not the erroneous calculations provided in Mr. Bastasch's November 12, 2021 Rebuttal Testimony. In his Sur-surrebuttal and Cross-Examination testimony, Mr. Bastasch acknowledged that he had erred in his initial calculations when classifying the weather. (Bastasch Cross-Exam. Test., Tr. Day 1, at 58-59.)

⁵⁸ In the context of the Public Services Standard, the "analysis area" means the area within the site boundary and 10 miles from the site boundary. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, pages 24-25 of 29; *See also* Grebe Rebuttal Test. at 6-7.)

143. As part of ASC Exhibit B,⁵⁹ Idaho Power included a “Road Classification Guide and Access Control Plan” to provide information about the access roads for the proposed facility. The purpose of the Road Classification Guide and Access Control Plan is “to define which Project roads are included within the Site Boundary” and “to classify each access road by the type and amount of disturbance” from the construction and operation of the proposed facility.⁶⁰ (ODOE - B2HAPPDoc3-3.2 ASC 02c_ Exhibit B_Attachment B-5_ASC_PART 1 2018-09-28, page 5 of 114.)

144. In the ASC, Idaho Power defined the term “Access Road” as “[a] linear travel route designated to support construction, operation, and maintenance of the transmission line.” (ODOE - B2HAPPDoc3-3.2 ASC 02c_ Exhibit B_Attachment B-5_ASC_PART 1 2018-09-28, page 8 of 114.) Idaho Power considered access roads to be “related or supporting facilities.”⁶¹ Idaho Power explained as follows:

Construction of the Project will require vehicle, truck, and crane access to all construction areas. Existing roads will be used as the main access road network. IPC assumes that existing paved roads and bridges were designed to meet Oregon Department of Transportation and Idaho Transportation Department and other applicable standards and will therefore not require improvements prior to Project construction. *Access to construction sites will require improvements to existing unpaved roads and construction of new access roads. Construction of new access roads will be required only as necessary to access structure sites lacking direct access from existing roads,* or where topographic conditions such as steep terrain, rocky outcrops, and drainages prohibit safe overland access to the Project. Most construction areas will be accessed using low-standard roads including those owned by private parties, counties, and state and federal agencies.

(*Id.*; emphasis added.)

145. Much of the heavy construction equipment necessary to construct the facility, such as large excavators, cranes, feller bunchers, and tracked equipment, generally will operate on the project right of way or private access roads, except when heavy equipment is moved from one isolated section of the line to another on public roads. (Grebe Rebuttal Test. at 9.)

⁵⁹ Pursuant to OAR 345-021-0010(1)(b), Exhibit B must include “information about the proposed facility, construction schedule and temporary disturbances of the site.”

⁶⁰ The Road Classification Guide and Access Control Plan is also included as Attachment B-5 to the Proposed Order. (See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8448 or 10016.)

⁶¹ The term “related or supporting facility” is defined in ORS 469.300(24) as “any structure, proposed by the applicant, to be constructed or substantially modified in connection with the construction of an energy facility * * *.”

146. Idaho Power used traffic consulting and engineering firms (Tetra Tech and HDR, Inc.) to develop and design the methodology and assumptions used to assess traffic safety impacts and determine mitigation measures. In ASC Exhibit U, Idaho Power included a traffic impact analysis and a Transportation and Traffic Plan that discusses proposed measures to mitigate construction impacts on traffic safety. (Grebe Rebuttal Test. at 11-12; ODOE - B2HAPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, pages 89-132 of 143.)

147. In ASC Exhibit U, Idaho Power also addressed whether existing roads would require improvements. Idaho Power also identified the minimum access-road requirements for the proposed transmission line and station construction and operation. Using the requirements for the passage of the largest piece of construction equipment (an aerial lift crane) as a baseline, Idaho Power's consultants determined that a 14-foot wide roadway and a 16 to 20-foot wide surface for turns are the minimum requirements for an access road. (ODOE - B2HAPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 116 of 143; ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 556 of 10016.)

148. In determining which existing roads would require improvements for the proposed facility's construction and operation, Idaho Power's consultants also considered the generally accepted industry standards for minimum access road requirements in terms of road grade and turns (horizontal curve radii). (Grebe Rebuttal Test., Exs. D and E; ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 557 of 10016.) The consulting firms conducted desktop reviews of existing roads based on aerial photos and, where practicable, field reconnaissance, to assess the width, grade, and condition of existing roads within the analysis area. (ODOE - B2HAPDoc3-3.2 ASC 02c_Exhibit B_Attachment B-5_ASC_PART 1 2018-09-28, page 14 of 114; Grebe Rebuttal Test. at 2-3.)

149. As noted previously, in the ASC Idaho Power proposed a primary route and alternative routes. In Union County, Idaho Power proposed the Mill Creek Route and the Morgan Lake Alternative. The Proposed Route enters Union County at MP 88.3, and traverses the county for 39.9 miles. At MP 105.8, the Proposed Route/Mill Creek Route runs approximately 0.4 miles west of the La Grande city limits.⁶² The 18.5 mile Morgan Lake Alternative Route runs to the west of the Proposed Route. It leaves the Mill Creek Route at MP 98.8, approximately 1 mile west of Hilgard Junction State Park. The Morgan Lake Alternative Route proceeds south and then southeast, crossing the Grande Ronde River at MP 0.8. It then turns east and southeast. At MP 6.3, the alternative route passes about 0.2 mile southwest of Morgan Lake. (ODOE - B2HAPDoc3-4 ASC 03_Exhibit C_Project_Location_ASC 2018-09-28, pages 15-16 and 24-25 of 193.)

⁶² ODOE - B2HAPDoc3-4 ASC 03_Exhibit C_Project_Location_ASC 2018-09-28, pages 15-16 of 193 (describing the Proposed Route in Union County). See ASC Exhibit C, Attachment C-2, Map 51, which shows the La Grande city limit boundary line, the site boundary line, and the unimproved portion of Hawthorne Road within the site boundary as potentially needing substantial modification. (ODOE - B2HAPDoc3-4 ASC 03_Exhibit C_Project_Location_ASC 2018-09-28, page 94 of 193.) See also ASC Exhibit B, Attachment B-5 (Road Classification Guide and Access Control Plan), Map 54, showing the same. (ODOE - B2HAPDoc3-3.3 ASC 02d_Exhibit B_Attachment B-5_ASC_PART 2 2018-09-28, Page 1 of 85.)

150. In the Proposed Order, Section IV.M.6, Public Services/Traffic Safety, the Department stated as follows:

The applicant classified road segments for existing roads to determine the extent of improvements needed and whether or not the road would then be included in the site boundary as a related or supporting facility. Existing roads that would be used for construction and operation of the proposed facility but would not require substantial modification are not “related or supporting facilities” and, therefore, are not included in the site boundary.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 557 of 10016.)

151. With regard to traffic safety concerns under the Public Services Standard, the Department included Recommended Public Services Condition 2, requiring Idaho Power to, among other things, submit to the Department a final county-specific Transportation and Traffic Plan at least 90 days prior to construction of a facility phase or segment. To address concerns about potential impacts from construction on roads managed by public service providers, the Department recommended that Idaho Power provide a list of permits and agreements from local jurisdictions as part of its final county-specific Transportation and Traffic Plan. The Department also recommended that Idaho Power update its Road Classification Guide and Access Control Plan and provide it as part of the final Transportation and Traffic Plan. The final county-specific Transportation and Traffic Plan must be approved by the Department, in consultation with each county or jurisdiction, prior to construction. (ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 568-71 of 10016.)

152. In the Proposed Order, at footnote 562, the Department explained:

Commenters, including Union County and the City of La Grande, expressed concerns about impacts from traffic and to roads including but not limited to Morgan Lake Road, Glass Hill Road, Old Oregon Trail Road, Olsen Road, Modelaire-Hawthorne Loop, and Sunset Drive. The Department notes that the applicant identifies these existing public roads as potential connecting access roads assumed to be maintained to meet road maintenance standards of the owner (County, ODOT, etc.). *The applicant is not representing to substantially modify these roads; therefore, they are not included in the site boundary proposed by the applicant in the ASC, under EFSC review.* See Recommended Public Services Condition 2 which requires a county-specific Transportation and Traffic Plan that identifies final haul routes, documentation of existing road conditions, and the requirement that if the applicant must substantially modify roads not currently within the site boundary, it must submit an Amendment Determination Request or submit a Request for Amendment of the Site Certificate receive Council approval via an amendment, if necessary. *[The unpaved portion of Hawthorne Drive]⁶³ is included in the site boundary, requiring substantial modification, 21-70%*

⁶³ The Proposed Order erroneously identifies this road as “Hawthorne Lane.” (ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 557 of 10016.)

improvements which may include reconstruction of portions of the road to improve road function. Possible road prism widening, profile adjustments, horizontal curve adjustments, or material placement. Final road improvements would be reviewed and approved by the Department, in consultation with each County as part of the county-specific Transportation and Traffic Plan.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 557 of 10016; emphasis added.)

153. In the Proposed Order, the Department concluded:

Based on the analysis presented here, and in compliance with recommended conditions, the Department recommends that the Council find that the construction and operation of the proposed facility is not likely to result in significant adverse impacts to the ability of public and private traffic safety providers within the analysis area. Additionally, the construction and operation of the proposed facility is not likely to result in significant adverse impacts to traffic volumes and congestion on proposed commuting and hauling routes proposed to be used by the applicant during construction.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 571 of 10016.)

154. On May 19, 2021, Idaho Power's traffic safety consultants traveled to La Grande to conduct a follow up site visit and field review of access roads for the proposed construction of the facility. The trip focused on reviewing access roads in the area between La Grande and Morgan Lake to determine whether the roads were adequate for construction and vehicle use or whether the roads may require modifications prior to use for construction vehicles. The site visit team also considered whether there were any safety measures that may be appropriate in connection with use of these roads in light of concerns raised by members of the public. (Grebe Rebuttal Test. at 13; Grebe Rebuttal Ex. B.)

155. On their May 19, 2021 field review, the site visit team drove Modelaire Drive and the paved portion of Hawthorne Drive (streets comprising the Hawthorne Loop) to survey the existing conditions. The site visit team analyzed the grade and curves of the roads in the Hawthorne Loop and again determined that construction vehicles should be able to ascend/descend the grades and navigate the curves without issue. (Grebe Rebuttal Test.; Grebe Rebuttal Ex. B at 6-7.) The consultants noted potential visibility concerns along the Hawthorne Loop. To address these concerns, Idaho Power proposes using traffic control measures such as pilot vehicles, traffic control flaggers, warning signs, lights, and barriers during construction to ensure safety, minimize localized traffic congestion, and avoid accidents due to limited visibility. These safety measures will be fully vetted by the Department, in consultation with Union County and the City of La Grande where applicable, in the Final Traffic Plan(s) for such road segments prior to construction. (Grebe Rebuttal Test. at 38.)

156. Because Idaho Power did not have an approved right of entry to the privately owned, gravel road portion of Hawthorne Drive, the site visit team was unable to perform site reconnaissance on that portion of the roadway.⁶⁴ (Grebe Rebuttal Test. at 26; Grebe Rebuttal Ex. B at 7.) However, based on observations from the paved portion of the Hawthorne Loop and Google Earth Imagery, Idaho Power's consultants determined that the unpaved portion of Hawthorne Drive is typically 15-23 feet wide with dirt/gravel surfacing and the existing width should be adequate to support construction vehicles while allowing them to pass oncoming traffic.⁶⁵ Horizontal curves appear to range from a 60 to 75 feet radius, and grades are approximately 15-17 percent when measured on Google Earth. Based on these observations, the measurements of the unpaved portion of Hawthorne Drive are within the minimum access road requirements stated in Idaho Power's application. (Grebe Rebuttal Test. at 40.)

157. Idaho Power's traffic safety consultants also determined that the unpaved, private access portion of Hawthorne Drive should be adequate to support construction traffic for the construction of the transmission line:

Construction vehicles used for rural transmission line construction are often all-wheel drive high clearance vehicles designed to traverse narrow and steep roads in rougher terrain. Interactions between construction vehicles and the traveling public should be minimal and limited to material/equipment delivery or morning and evening trips as crews access the work area. Construction traffic may need to use caution and reduced speeds, as well as implement additional traffic control measures, such as flashing beacons or brightly colored equipment, if there are reduced visibility situations. Barricades, fencing, or traffic delineators could also be set up to separate vehicles from pedestrians if a particular location of concern is noted.

(Grebe Rebuttal Ex. B at 8; *see also* Grebe Rebuttal Test. at 28.)

158. Based on the consultants' access road field reviews, Idaho Power determined that substantial modifications are unlikely, but may possibly be required for the unpaved, private access portion of Hawthorne Drive. To avoid tight turning conditions and possible traffic congestion issues on the gravel road, Idaho Power could and likely would air-lift materials and equipment by helicopter, coordinate with nearby property owners to implement one-way traffic for short periods of times (approximately half an hour), or use flaggers and pilot spotter vehicles. (Grebe Rebuttal Test. at 26-27.)

⁶⁴ A portion of this unpaved, privately owned road is located within the city limits (Tax Lot 4700) and the remainder is located within Union County. The road primarily serves as an access (the only ingress and egress) for property owners, residents and/or emergency and service vehicles. (Mammen Direct Test; Horst Direct Test.)

⁶⁵ According to Mr. Horst's measurements, the widest part of the road is 20 feet, with sections at 14 feet wide. (Horst Direct Test.)

159. Because Idaho Power has not yet been granted access to the unpaved, private access portion of Hawthorne Drive to perform a detailed reconnaissance review, the Company conservatively assumed that its construction contractor might need to make substantial modifications to the roadway by widening certain parts of the gravel roadway to mitigate tight turning conditions. Additionally, Idaho Power determined that this portion of roadway would likely need non-substantial maintenance activities such as blading⁶⁶ and watering for dust mitigation. (Grebe Rebuttal Test. at 27.)

160. The unpaved, private access portion of Hawthorne Drive is located in a geologic hazard zone that encompasses a large area of the west hills of La Grande. (Mammen Direct Test. at 5; Mammen Ex. 6.) Therefore, if it is later determined that the roadway needs substantial modification in connection with the proposed facility construction or operation, Idaho Power will, prior to construction or road modification, complete appropriate engineering due diligence and consult with a licensed civil engineer to assess the proposed construction or road design in relation to potential geologic hazards. (Grebe Rebuttal Test. at 42-43.)

161. Limited parties Horst and Cavinato reside in a home on the privately owned, unpaved portion of Hawthorne Drive that is within the city limits of La Grande. The La Grande to Hilgard segment of the Oregon Trail passes through Mr. Horst's property. This segment is listed on the National Registry. (Horst Direct Test.; Horst Ex. I.) There are visible ruts where the trail leaves the main road. (Horst Direct. Test.) There is also a deep water well on the property, located approximately 10 feet from the gravel road. (*Id.*; Horst Ex. H.)

162. Mr. Horst raised safety concerns about construction vehicle use of the Hawthorne Loop because there are no sidewalks in the neighborhood. Mr. Horst also raised concerns about construction vehicle use of the Hawthorne Loop and use of the unpaved, privately owned portion of Hawthorne Drive due to blind corners, narrow roads, and the "steep terrain." (Horst Direct Test. at 3-5.) In addition, Mr. Horst expressed concern that passing heavy construction equipment could cause damage to the well on his property. (*Id.* at 6.)

163. In the opinion of Idaho Power's geotechnical engineering expert, Mr. Horst's concern that vibrations from passing construction vehicles, including large construction haul trucks, excavators, cranes, or tracked equipment, are minimal and are unlikely to have a permanent impact on nearby structures unless there is significant cumulative fatigue. The proposed construction-related traffic on Hawthorne Drive adjacent to Mr. Horst's property, three or four daily one-way trips of large construction vehicles, is not enough to result in a cumulative fatigue effect or cause permanent damage. The vehicles will be traveling at a reduced speed as a mitigation measure and any turbidity in the well water that caused by the passing of construction vehicles will be temporary. (Cummings Rebuttal at. 46.)

⁶⁶ Blading entails the redistribution of surface material over the road surface using a mechanical grader. Bladed road features typically include cuts and/or fills to construct a smooth travel surface and manage surface water drainage and include the manipulation or creation of a road prism and profile. Bladed roads are used where side slope is over 8 percent or over rough and uneven terrain. (Grebe Rebuttal Test. at 33.)

164. Dale and Virginia Mammen reside in a home on Balsa Street, off of Modelaire Drive in the Hawthorne Loop. The Mammens also raised traffic safety concerns about construction vehicle use of the Hawthorne Loop and the unpaved, privately owned portion of Hawthorne Drive⁶⁷ due to blind corners, narrow roads, steepness, and slope instability. (Mammen Direct Testimony at 4-7.)

Findings related to the Public Services standard – Fire Protection

165. In the Second Amended Project Order, with regard to fire protection, the Department directed that the ASC include “an analysis of potential facility-related impacts to fire protection services, including fire protection on forestland and rangeland.” (ODOE - B2HAPPD0c15 ApASC Second Amended Project Order 2018-07-26, page 22 of 29.)

166. In ASC Exhibit U, Idaho Power explained that most of the land within the site boundary, approximately 72 percent, is privately owned. The BLM manages about 25 percent of the land in the Site Boundary, with the remaining 3 percent managed by other federal (USFS and U.S. Bureau of Reclamation) or State agencies. Idaho Power also explained that, for private lands within the analysis area, fire protection and response falls to fire departments, rural fire protection districts, and rangeland fire protection associations. (ODOE - B2HAPPD0c3-38 ASC 21_ Exhibit U_PublicServices_ASC 2018-09-28, pages 18-21 of 143.)

167. In preparing ASC Exhibit U, Idaho Power contacted federal, state, and local fire response organizations within the analysis area. Each organization provided information regarding the number of paid and volunteer firefighters in the organization, the firefighting equipment, and the estimated response times to reach the project site. (ODOE - B2HAPPD0c3-38 ASC 21_ Exhibit U_PublicServices_ASC 2018-09-28, pages 20-21, 58 of 143.) Idaho Power incorporated the information received into ASC Exhibit U, Table U-10, which summarizes staffing levels, equipment, and response times that responded to the requests for information.⁶⁸ (*Id.* at pages 20-21 of 143.) Idaho Power also explained as follows:

Not all lands in the analysis area fall within a designated fire district. In those cases, the closest or best situated fire district responds to fires. Mutual aid agreements have been established between local fire districts and adjacent counties to pool resources, ensure cooperation between these entities, and prevent fires on a county and state level instead of isolating efforts to local districts (Martin 2016; Hessel 2016; Morgan 2016; Weitz 2016). As a result of these mutual aid agreements, the fire district that responds to a fire may not be the district that the fire occurs in, or even the closest district; instead, response is based on the district that is best situated and suited to respond. In addition, fire

⁶⁷ The Mammens refer to this portion of Hawthorne Drive as a “private easement access (PEA)” because it is privately owned, and not a county road or city street. (Mammen Direct Test. at 3.)

⁶⁸ At the time the La Grande Rural Fire Protection District provided information to Idaho Power (in 2017), the Morgan Lake area was not under the district’s protection. (Deposition of Kretschmer at 6-8. Cooper Direct Ex. 6.) In 2019, the district annexed 21 or 22 properties in the general vicinity of Morgan Lake to its protection area, but not Morgan Lake Park. (*Id.* at 40, 45, 50.) Morgan Lake Park is dual protected by the Oregon Department of Forestry and the City of La Grande. (*Id.* at 8.)

protection agencies in Idaho may be the best positioned to respond to a fire along portions of the Project in Malheur County, Oregon.

Response times to fires in the analysis area vary depending on the time of day, the priority of the emergency/call and the location of the emergency and the type of available access. Most of the fire districts within the analysis area comprise volunteers, and in some cases, it takes considerable time to collect and mobilize an entire fire crew. In addition, much of the analysis area includes open remote lands where access is limited. A fire in one of these areas may not be immediately identified. However, once a fire has been identified, the fire districts responding to requests for information have indicated that average response times range from about 8 to 40 minutes, depending on the location[.]

(*Id.* page 20 of 143.)

168. Idaho Power also addressed the project-related impacts on fire protection services, and stated that considering the Company's Fire Prevention and Suppression Plan (Attachment U-3), the project was not expected to have significant adverse impacts. Idaho Power explained that it developed the draft Fire Prevention and Suppression (FPS) Plan to ensure that fire prevention and suppression measures are carried out in accordance with federal, state, and local regulations. Idaho Power added that:

By implementing these measures, the Project will not increase fire ignitions, and therefore will not impact sagebrush steppe and native grasslands. The final plan will incorporate input from the construction contractor to ensure coordination with local fire fighters and emergency responders for effective emergency response.

(ODOE - B2HAPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 28 of 143.)

169. In ASC Exhibit U, Idaho Power further explained the following:

Wildfires are a concern in the general Site Boundary area. IPC believes that during facility construction and operation the abilities of the rural fire districts and the BLM and USFS to provide fire protection services within the Site Boundary will be enhanced for the following reasons:

- Establishment of Project roads that will reduce response time, serve as potential fuelbreaks and point of attack for firefighting personnel;
- Presence of earthmoving equipment within the Site Boundary during construction; and
- Presence of water trucks within the Site Boundary during construction.

The concerns of these local fire protection agencies include traffic, access, and safety issues, and mitigation for each are included in Attachment U-2, Section 4.2.1.

(ODOE - B2HAPPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 29 of 143.)

170. ASC Exhibit U, Attachment U-3, the FPS Plan describes the fire prevention measures to be taken during construction, operation and maintenance of the facility. Idaho Power explained that prior to and during construction, measures would be taken to minimize the risk of fire including: training personnel, prohibiting smoking, using spark arresters, clearing parking areas, vehicles and storage areas of flammable material, providing fire extinguishing equipment, prohibiting burning, and maintaining communications with fire control agencies. Idaho Power acknowledged its responsibilities for fire suppression on lands protected by the Oregon Department of Forestry, and agreed to restrict or cease construction operations in specified locations during periods of high fire danger at the direction of the land-management agency's closure order. (ODOE - B2HAPPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, pages 137-143 of 143.)

171. In the draft FPS Plan, Idaho Power explained Oregon's wildfire protection system, fire suppression responsibilities and coordination between agencies and organizations. The draft FPS Plan states:

The prevention and suppression of wildfires in eastern Oregon is carried out by the BLM, USFS, Oregon Department of Forestry (ODF) in conjunction with the Rangeland Fire Protection Associations (RFPA) and Rural Fire Protection Districts (RFPD), and local fire districts and agencies (Table 1). The agencies' activities are closely coordinated, primarily through the Pacific Northwest Wildfire Coordinating Group. Coordination of firefighting resources also occurs under Oregon's Emergency Conflagration Act that allows the state fire marshal to mobilize and dispatch structural firefighting personnel and equipment when a significant number of structures are threatened by fire and local structural fire-suppression capability is exhausted.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9777 of 10016.)

172. With regard to facility operation, the draft FPS Plan states:

During transmission line operation, the risk of fire danger is minimal. The primary causes of fire on the ROW result from unauthorized entry by individuals for recreational purposes and from fires started outside the ROW. In the latter case, authorities can use the ROW as a potential firebreak or point of attack. During transmission line operation, access to the ROW will be restricted in accordance with jurisdictional agency or landowner requirements to minimize recreational use of the ROW.

(ODOE - B2HAPPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 142 of 143.)

173. In the Proposed Order, the Department addressed the provisions of the draft FPS Plan. In discussing the fire protection districts service territory and the proposed facility, the Department noted that the vast majority of the proposed facility would be located either within the boundaries of a local fire response organization or on federal land where fire response is managed by BLM or the Forest Service. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 581 of 10016.) The Department also found as follows:

During construction, in those areas covered by a fire response organization or located on federal land, the certificate holder would attempt to negotiate an agreement with the relevant fire response organization or federal agencies as presented in Table PS-10 above, outlining communication and response procedures for potential fires within their boundaries. In those areas not covered by a fire response organization and not located on federal land, the certificate holder would attempt to negotiate an agreement with nearby fire response organizations or the federal agencies to provide fire response. If no such agreements can be reached, the certificate holder would propose alternatives such as contracting with a private fire response company or providing additional firefighting equipment at those sites. These commitments are represented in Section 1.4 Fire Response Agreements of the draft Fire Prevention and Suppression Plan (see Attachment U-3 of this order), referenced in recommended Public Services Condition 6 below.

In accordance with OAR 345-025-0016, the Department incorporated an agency review process, inclusive of a dispute resolution component, into the draft Fire Prevention and Suppression Plan, to allow appropriate federal, state and local agencies an opportunity to review and comment on the plan, including identification of appropriate fire district contacts and agreement components.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 583-84 of 10016.)

174. The Department proposed amending the draft FPS Plan to include the following:

1.4 Fire Response Agreements

In areas not covered by a fire response organization or located on federal land, the certificate holder will attempt to negotiate an agreement with the relevant fire response organization or federal agencies as presented in Table 2 above, outlining communication and response procedures for potential fires within their boundaries during facility construction and operation. In those areas not covered by a fire response organization and not located on federal land, the certificate holder will attempt to negotiate an agreement with nearby fire response organizations or the federal agencies to provide fire response. If no such agreements can be reached, the certificate holder will propose alternatives such as contracting with a private fire response company or providing additional

firefighting equipment at those sites. The certificate shall provide documentation to the Oregon Department of Energy, demonstrating the final agreements or alternative contract agreements for fire response.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9780 of 10016.)

175. To ensure Idaho Power's compliance with the FPS Plan and reduce potential impacts to fire protection providers during construction, the Department recommended the Council impose the following:

Recommended Public Services Condition 6: Prior to construction of a facility phase or segment, in accordance with the OAR 345-025-0016 agency consultation process outlined in the plan (Attachment U-3 of the Final Order on the ASC), the certificate holder shall submit final Fire Prevention and Suppression Plan(s) to the Department. The final Fire Prevention and Suppression Plan shall include the following, unless otherwise approved by the Department:

- a) The protective measures as described in the draft Fire Prevention and Suppression Plan as provided in Attachment U-3 of the Final Order on the ASC. The final plan shall establish that wildfire training for onsite workers and facility personnel be conducted by individuals that are National Wildfire Coordination Group and Federal Emergency Management Agency certified.
- b) A description of the fire districts and rural fire protection districts that will provide emergency response services during construction and copies of any agreements between the certificate holder and the districts related to that coverage.
- c) All work must be conducted in compliance with the approved plan during construction of the facility.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 587 of 10016.)

176. In the Proposed Order, the Department also addressed operational fire protection management. The Department noted that in the ASC, Idaho Power "describes and provides practices, protocols and management plans to manage wildfire risk, all of which would apply to the proposed facility."⁶⁹ (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 588 of 10016.) The Department further found as follows:

The applicant describes its intent to develop and implement a Wildfire Mitigation

⁶⁹ Idaho Power included measures to reduce the risk of fire in its draft FPS Plan, the Right of Way Clearing Assessment and the Vegetation Management Plan. (Lautenberger Direct Test. at 55.) In addition, the Company's Wildfire Mitigation Plan includes actions that will address the risk of wildfires during operation of the project. (*Id.*; see also Lautenberger Rebuttal Test. at 55.)

Plan that identifies strategies to further mitigate fire-related risks associated with its transmission operations and how the company prevents and responds to fire events. The Wildfire Mitigation Plan would utilize a risk-based approach that focuses on assessing wildfire risk and then taking actions to prevent wildfires and damage to infrastructure from wildfires. Operations and maintenance practices, programs, and activities would have specific targeted actions in those high wildfire threat areas. The Wildfire Mitigation Plan would also identify performance metrics and monitoring to ensure actual actions are consistent with those set forth in the plan.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02. Page 590 of 10016.)

177. The Department recommended the Council impose Recommended Public Services Condition 7, as follows:

Recommended Public Services Condition 7: The certificate holder shall:

a. Prior to operation, provide a copy of its Wildfire Mitigation Plan to the Department and each affected county which provides a wildfire risk assessment and establishes action and preventative measures based on the assessed operational risk from and of wildfire in each county affected by the facility. The plan shall address facility and emergency contacts, agency coordination and responsibilities, necessary fire-fighting equipment, and long-term agreements with service providers, as needed.

b. During operation, the certificate holder shall update the Wildfire Mitigation Plan on an annual basis, or frequency determined acceptable by the Department in consultation with the Oregon Public Utilities Commission.

c. During operation, for the service territories the facility would be located within, the certificate holder shall provide to each of the fire districts and rural fire protection a contact phone number to call in the event a district needs to request an outage as part of a fire response.

d. Any Wildfire Mitigation Plan required by the Oregon Public Utilities Commission shall be considered by EFSC as meeting the requirements of this condition.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 590 of 10016.)

178. The Department concluded that based on the analysis presented in the Proposed Order, and in compliance with recommended conditions:

[T]he Department recommends that the Council find that the construction and operation of the proposed facility is not likely to result in significant adverse

impacts to the ability of public and private fire protection providers to provide fire response services within the analysis area.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 590 of 10016.)

179. The risk of project-related wildfires is assessed by considering both the probability of fire and the potential consequence of the fire. (Lautenberger Rebuttal Test. at 61.)

180. In 2020, Idaho Power prepared its 2021 Wildfire Mitigation Plan and submitted the plan to the Oregon PUC (OPUC) and the Idaho PUC (IPUC) for approval. The primary objectives of the Wildfire Mitigation Plan are to identify and implement strategies that reduce wildfire risk associated with Idaho Power's transmission and distribution facilities and improve Idaho Power's transmission and distribution system's resiliency to any wildfire event, independent of the fire's ignition source. (Dockter Direct Test. at 3-4; Dockter Direct Ex. A at 11.) In December 2021, Idaho Power issued its 2022 Wildfire Mitigation Plan, which it submitted to the OPUC on December 30, 2021 in preparation for the 2022 fire season. (Dockter Cross-Exam. Test., Tr. Day 3 at 22; Dockter Sur-surrebuttal Ex. B.) Aside from the inclusion of a Public Safety Power Shutoff Plan (PSPS Plan) in the 2022 version, the differences in the two Wildfire Mitigation Plans are minor. (Dockter Cross-Exam. Test, Day 3, Tr. 3 at 22.)

181. The 2022 Wildfire Mitigation Plan includes measures to address weather-related wildfire risks. The Wildfire Mitigation Plan includes a specific fire potential index (FPI) tool that incorporates fire weather into the decision-making tool to reduce fire threats and risks. The FPI reflects key variables, such as the state of native vegetation across the service territory (also known as a "green-up"), fuels (ratio of dead fuel moisture component to live fuel moisture component), and weather (sustained wind speed and dew point depression). (Docker Rebuttal, Exhibit A, at 18; Lautenberger Rebuttal Test. at 44.) Each variable is assigned a numeric value, and those individual numeric values are summed to generate an FPI score from zero to 16, which expresses the degree of fire threat expected for each of the 7 days included in the forecast. The Company then characterizes the risk as Green, Yellow, or Red based on the FPI score. A Green FPI score indicates low potential for a large fire to develop and spread, a Yellow score indicates an elevated potential, and a Red score indicates a higher potential for fire based on below normal vegetation and fuel moisture content, combined with strong winds and low relative humidity. (*Id.*; Lautenberger Rebuttal Test. at 45.)

182. In the 2022 Wildfire Mitigation Plan, Idaho Power specifically considered the route of the proposed facility. Idaho Power identified two locations along the route as having an increased wildfire risk (Yellow risk zone) and no areas of higher risk (Red risk zone). Although the proposed facility has not yet been built, Idaho Power stated its intention to apply its annually-reviewed Wildfire Mitigation Plan to the construction and operation of the facility. (Dockter Sur-surrebuttal Test., Ex. B, at 19.)

183. The PSPS Plan included in the 2022 Wildfire Mitigation Plan addresses Idaho Power's ability to proactively de-energize its electrical facilities in identified areas of extreme wildfire risk to reduce the potential of those electrical facilities becoming a wildfire ignition

source or contributing to the spread of wildfires. (Docket Sur-surrebuttal Test., Ex. B at 65-95.) As set out in the PSPS Plan, Idaho Power will initiate a power shutoff plan if the Company determines a combination of critical conditions indicate the transmission and distribution system at certain locations is at an extreme risk of being an ignition source and wildfire conditions are severe enough for the rapid growth and spread of wildfire. Idaho Power will evaluate as a whole (not relying on one single factor but a combination of all factors), without limitation, the criteria set forth in the plan. (*Id.* at 75.)

184. The 2022 Wildfire Mitigation Plan specifically addresses Red Flag Warnings as a consideration in implementing the PSPS Plan. The Plan states:

A Red Flag Warning (RFW) is a forecast warning issued by the National Weather Service (NWS) to inform the public, firefighters and land management agencies that conditions are ideal for wildland fire combustion and rapid spread. RFWs are often preceded by a Fire Weather Watch (FWW), which indicates weather conditions that could occur in the next 12–72 hours. The NWS has developed different zones across the nation for providing weather alerts (such as RFWs) to more discrete areas. These zones are shown on this NWS webpage: [] RFWs for Idaho Power's service territory include Idaho Zones (IDZ) 401, 402, 403, 413, 420 and 422; and Oregon Zones (OR) 636, 637, 642, 634, 644, 645 and 646; and are monitored and are factored into Idaho Power's determination of whether to initiate a PSPS. Boise and Pocatello NWS offices will not issue RFWs if fuels are moist and fire risk is low. The following thresholds are used by most NWS offices:

- Daytime:
 - Relative humidity of 25% or less
 - Sustained winds greater than or equal to 10 miles per hour (mph) with gusts greater than or equal to 20 mph over a four-hour time period
- Nighttime:
 - Relative humidity of 35% or less
 - Sustained winds greater than or equal to 15 mph with gusts greater than or equal to 25 mph over a three-hour time period
- Lightning:
 - The NWS rarely issues RFWs for lightning in the western United States. For this to occur, the Lightning Activity Level—a measure of lightning potential specifically as it relates to wildfire risk—needs to be at 3 or higher.

(Docket Sur-surrebuttal Test., Ex. B, at 76; *see also* Lautenberger Rebuttal Test. at 38.)

185. High voltage transmission lines are less likely to ignite fires than lower voltage lines because, as the voltage increases: (1) taller and more resilient support structures (poles/towers) are used to keep conductors at greater distances from ground level; (2) the requirements for right-of-way clearance become stricter as line voltage increases and create a

broader right-of-way; and (3) vegetation is less likely to contact energized lines because conductors are more likely to be sited above tree canopy and vegetation management practices become more aggressive. (Lautenberger Direct Test. at 41.)

186. Distribution and transmission lines are classified by voltage. Generally speaking, distribution lines carry less than 34 kV; subtransmission lines carry 34, 46, and 69 kV; high voltage transmission lines carry between 115 kV and 230 kV; extra high voltage lines (EHV) carry 345, 500 and 765 kV; and ultra-high voltage lines carry more than 765 kV. (Lautenberger Direct Test. at 42.) EHV and ultra-high voltage lines have stricter requirements on minimum tower height, right-of-way width, and vegetation encroachment than high voltage transmission lines. (*Id.* at 46.)

187. 500 kV towers have construction requirements that are much more robust than those for lower voltages. Tower heights are increased and rights-of-way, usually between 150 feet and 250 feet, are wider relative even to high voltage transmission lines. These requirements reduce the potential for tree line contact or conductor clashing to cause fires, because aluminum particles are likely to burn to completion before contacting the ground. Furthermore, 500 kV lines are typically mounted on steel lattice towers that are stronger than the single-pole steel or wooden poles used for lower voltages. The stricter engineering requirements, higher tower heights, and wider rights-of-way make extra high voltage transmission lines, including 500 kV lines such as the proposed facility, less likely to cause fires than high voltage transmission lines. (Lautenberger Direct Test. at 46-47.)

188. Idaho Power's fire protection expert, Dr. Christopher Lautenberger, conducted an analysis of fire ignitions associated, or allegedly associated, with electrical transmission lines. He analyzed the most current data from the California Public Utilities Commission (as no analogous data exist for Oregon or Idaho) and found that of nearly 3,200 total ignitions, only two were associated with 500 kV transmission lines. (Lautenberger Direct Test. at 52.) Based on his research, Dr. Lautenberger concluded, "only an extremely small percentage of fire ignitions have been caused by high voltage transmission lines, with an even smaller percentage of fires associated with extra high voltage transmission lines such as B2H." (*Id.* at 54.) Dr. Lautenberger further noted that the proposed route for the project parallels or closely follows the Quartz to La Grande 230 kV transmission line for approximately 43 miles. That transmission line has been in operation nearly 70 years and Idaho Power has found no evidence of the line causing a fire. (*Id.* at 55; *see also* Dockter Direct Test. at 5.)

189. Dr. Lautenberger also analyzed data from the Fire Occurrence Database to determine historical fire ignitions within 50 miles of the project site. He found that approximately 16,000 fires had ignited within 50 miles of the project site between 1992 and 2018. The vast majority of these fires were small and quickly contained. Since 2000, eight fires exceeding 10,000 acres have burned within one mile of the project site. These large fires were caused by lightning, and not power lines. Dr. Lautenberger concluded that given the frequency of ignitions in the area, the fire ignition rates potentially associated with the project route are insignificant in comparison to the background ignition rates from natural and human-caused fires. He also considered the frequency of ignitions juxtaposed with the historic perimeters of fires and determined that fires that ignite in the area are often contained while they are still small.

(Lautenberger Rebuttal Test. at 25-27.)

190. In Dr. Lautenberger's opinion, the occurrence of severe fire weather near the proposed facility site is less frequent than in places like Northern California, where the largest wildfires have occurred. Offshore winds that have driven many of the large-loss fires in California are not a concern in Idaho or Eastern Oregon. Historically, wildfires near the project site have been relatively small and quickly contained. (Lautenberger Rebuttal Test. at 53.) Moreover, although Red Flag Warnings occur in Eastern Oregon, it is still unlikely that the project would start a fire in Red Flag Warning weather conditions because fires caused by 500 kV transmission lines are exceedingly rare. (Lautenberger Rebuttal Test. at 54.)

191. Limited parties raised the concern that transmission lines can exacerbate existing fires through arcing or flashovers. Arcing or flashovers can occur when there is a fire burning adjacent to or underneath transmission lines. According to Dr. Lautenberger, research literature on fire-induced flashovers of transmission lines has found that "it is the flame that has a high ion and electron concentration, making it conductive, which causes flashover when extended from the ground into the proximity of the conductor." (Lautenberger Rebuttal Test. at 59.) Because the proposed facility will have a minimum ground clearance of 34.5 feet and because flame heights of approximately 35 feet are not likely to occur in the right-of-way, it is unlikely that a fire would cause a flashover on the proposed facility. (*Id.*) In addition, the risk of flashovers does not result in a significant adverse impact to fire response providers' ability to provide fire protection in the area because the line would be de-energized in the event of fire. (*Id.* at 60.)

192. Limited parties also raised the concern that, in ASC Exhibit U, Table U-10, Idaho Power understated the response times of local fire protection organizations to respond to a fire in the project site area, and in particular, understated the time in which the La Grande Rural Fire Protection District (LGRFPD) could respond to a fire in the area of Morgan Lake.⁷⁰ (Cooper Direct Test. at 7, 12-13; Cooper Surrebuttal Test.) However, the LGRFPD is not the primary agency responsible for responding to a fire in the vicinity of Morgan Lake. There are two other fire response agencies, the La Grande Fire Department and the Oregon Department of Forestry (ODF), that share primary responsibility for fire protection in the Morgan Lake area.⁷¹ Both agencies are located closer to Morgan Lake than the LGRFPD and are therefore likely able to respond more rapidly to a fire at or near Morgan Lake. (Docket Cross-Exam. Test., Tr. Day 3 at 17; Docket Sur-surrebuttal Ex. C.) Furthermore, if there was a wildland fire in that area, the ODF would likely take the lead on the fire. (Docket Cross-Exam. Test., Tr. Day 3 at 17.) In addition, in the event of such a fire, the Blue Mountain Interagency Dispatch Center would be able to deploy aerial resources from the La Grande Airport, which is located approximately four

⁷⁰ Table U-10 sets out the LGRFPD's response time to the analysis area generally (4 to 8 minutes), and not specifically to the Morgan Lake Area. (ODOE - B2HAPPDoc3-38 ASC 21 Exhibit U Public Services ASC 2018-09-28, page 21 of 143.) However, for a fire near Morgan Lake Park, it would take the LGRFPD several minutes longer (between 12 to 16 minutes) to respond to the top of Morgan Lake Road in a brush tender. (Deposition of Craig Kretschmer, May 13, 2021, at 9-11, Cooper Direct Ex. 6; see also Cooper Direct. Test. at 13.)

⁷¹ (Deposition of Craig Kretschmer, May 13, 2021, at 8, 12-1; Cooper Direct Ex. 6.)

miles from La Grande and about six miles from Morgan Lake. (*Id.* at 17-18.)

193. The risk of fire in the area in proximity to Mr. Myers' agricultural operations in Morrow County is also low, given the irrigation, fallow fields, and discontinuous fuels. In addition, the slopes adjacent to the property are predominantly less than 15 degrees. The lack of fires occurring in the area historically indicates the area is of lower fire risk than areas that have burned previously.⁷² (Lautenberger Rebuttal Test. at 54; Lautenberger Cross-Exam. Test, Day 3, Tr. 3 at 43-44.) Consequently, considering the distance between phases on the project's structures, the height of the structures, and the soil type along the site boundary, the probability that a whirlwind or dust devil would ignite a fire along the transmission line is very small. (Lautenberger Rebuttal Test. at 55.)

Findings related to the visual impact assessment under the Scenic Resources, Protected Areas, and Recreation standards.

Visual impact assessment methodology

194. In the Second Amended Project order, the Department ordered as follows with regard to Idaho Power's methodology for assessing the visual impacts of the proposed facility on scenic resources:

A visual impact assessment is required as part of Exhibit R; while no specific methodology is required by EFSC rule, the applicant must demonstrate why the proposed facility is [in] compliance with the Scenic Resources standard. Visual simulations or other visual representations are not required, but can provide important evidence for use by the Department and Council in understanding the potential visual impact of the proposed facility to Scenic Resources.

It is recommended the application include visual depictions (photo-simulations) of the project's impact on scenic resources within the analysis area and that the visual simulations include depictions from select viewpoints in protected areas identified in Exhibit L that may be affected by the proposed facility. It is also recommended that any photo-simulations and visual impacts assessments of permanent structures include all facility components, as applicable. For the purposes of Exhibit R, "local" land use plans include state, county, and city planning documents or inventories. The applicant shall also describe the measures it will take to minimize significant adverse impacts to important scenic resources.

(ODOE - B2HAPPD0c15 ApASC Second Amended Project Order 2018-07-26, page 20 of 29.)

⁷² In his cross-examination testimony, Dr. Lautenberger explained that Idaho Power has no record of dust devils causing outages or fires anywhere in its service territory. He also testified that he analyzed Morrow County data from the Homeland Infrastructure Foundation Level Dataset, which showed there are 400 miles of transmission lines in Morrow County, including about 90 miles of 500 kV lines. He cross-referenced that data with ignition locations from the fire-occurrence database and determined that "if dust devils do occur in Morrow County in the vicinity of transmission lines, they have not led to any fire ignitions." (Lautenberger Cross-Exam. Test., Tr. Day 3 at 44.)

195. The Second Amended Project Order provided similar direction with regard to Exhibit T and the Recreation standard:

A visual impact assessment is required as part of Exhibit T; while no specific methodology is required by EFSC rule, the applicant must demonstrate why the proposed facility is [in] compliance with the Recreation standard. Visual simulations or other visual representations are not required, but can provide important evidence for use by the Department and Council in understanding the potential visual impact of the proposed facility to important Recreation sites.

(ODOE - B2HAPPD0c15 ApASC Second Amended Project Order 2018-07-26, page 22 of 29.)

196. The Second Amended Project Order also provided the same direction with regard to Exhibit L and the Protected Area standard: “A visual impact assessment is required as part of Exhibit L; while no specific methodology are required by EFSC rule, the applicant must demonstrate why the proposed facility is [in] compliance with the Protected Areas standard.” (ODOE - B2HAPPD0c15 ApASC Second Amended Project Order 2018-07-26, page 16 of 29.)

197. As required by the Second Amended Project Order, Idaho Power included visual impact assessments as part of ASC Exhibits L, R, and T. In Exhibit L Attachment L-3, Exhibit R Attachment R-1, and Exhibit T Attachment T-4, Idaho Power described its methodology for assessing the proposed facility’s impact to visual resources. ASC Exhibit R Attachment R-1, states as follows:

The methodology described in Attachment R-1 of this document was applied to the impact assessment and significance determination presented in Exhibits L, R, and T. This methodology, though rooted in impact assessment procedures established by the Bureau of Land Management (BLM) and United States Department of Agriculture Forest Service (USFS), addresses feedback from the Oregon Department of Energy (ODOE) received via Request for Additional Information (RAI) R-24, asking that the definition of “significance” provided in the Energy Facility Siting Council’s (EFSC or Council) rules at OAR 345-001-0010(52) be considered in the analysis.

(ODOE - B2HAPPD0c3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 140 of 570.)

198. As the Company explained in ASC Exhibit R, Attachment R-1 Idaho Power performed a three-part analysis for each identified resource: (1) establish baseline conditions; (2) assess potential impacts of the project; and (3) determine potential significance of project impacts. Consistent with OAR 345-001-0010(52), the Company based its determination of whether an impact may be significant by considering the “context of the action or impact, its intensity and the degree to which the possible impacts are caused by the proposed action.” (ODOE - B2HAPPD0c3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 157 of 570.)

199. Idaho Power's methodology for assessing impact to visual resources incorporated the BLM visual "sensitivity level" criterion and the USFS visual "concern" criterion, both of which measure the degree to which viewers subjectively value a visual resource. Scenic resources that viewers value highly are considered "highly sensitive" (under the BLM Visual Resource Management (VRM) or of "high concern" (under the USFS Scenery Management System (SMS)). (See ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 147 of 570.)

200. In the ASC, Idaho Power explained its visual impact assessment methodology for establishing baseline conditions as follows:

Baseline conditions were established by assessing indicators of *scenic quality/attractiveness* and *landscape character* for each resource. The assessment was completed using a combination of general observations made during field visits, baseline data collected at representative KOPs [key observation points], and review of landscape features relative to Project components using Google Earth. These data were used to identify baseline landscape character and scenic quality for each scenic resource. Viewer groups were also identified as part of establishing baseline conditions. KOPs were identified through review of applicable land use and resource plans, consultation with agencies and organizations, and viewshed analysis. The KOPs used in the analysis are indicated on the maps included as Attachment R-2.

The analysis area includes scenic resources administered by the BLM and USFS. Both agencies have established baseline scenic resources inventory procedures:

- The BLM manages visual resources through the Visual Resource Management System (BLM 1986). Visual values are established through the visual resource inventory (VRI) process, which classifies scenery based on the assessment of three components: scenic quality, visual sensitivity, and distance.
- The USFS manages scenic resources through the Visual Management System established in *The National Forest Management, Volume 2, Agricultural Handbook 462* (1974) to inventory, classify, and manage lands for visual resource values. In 1995, the USFS visual resource management guidelines and monitoring techniques evolved into the Scenery Management System (SMS) as described in *Landscape Aesthetics: A Handbook for Scenic Management, Agricultural Handbook* (USFS 1995). The USFS describes baseline condition in a similar manner; however baseline components include measures of scenic attractiveness and integrity, landscape visibility (i.e., distance zones), and concern level (i.e., sensitivity).

Because analogous concepts to scenic quality are found in the USFS SMS as scenic attractiveness and in the BLM Visual Resource Management system as scenic quality, the approach and terminology used by these land management

agencies was used to assess baseline conditions on lands administered by these agencies. In other words, the BLM system was used on BLM lands and USFS system was used on USFS lands. To address scenic resources on non-BLM or non-USFS lands, the method that most closely matched the prevailing geographic location and physiography of the resource were used according to the following conventions:

- BLM methods were applied to scenic resources in non-forested areas.
- USFS methods were applied to scenic resources in forested areas.

(ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 147 of 570.)

201. In its visual assessment analyses, Idaho Power conservatively assumed the highest possible degree of sensitivity and subjective value for each resource evaluated. In ASC Exhibit R Attachment R-1, Idaho Power explained:

Viewer groups associated with each resource were evaluated to understand certain characteristics that inform the extent to which potential changes in landscape character and quality would be perceived (perception of change). *This assessment assumes a high sensitivity exists among all viewer groups based on the identification of the resource as important in a planning document. Therefore, this assessment instead focuses on understanding characteristics that describe the relationship of the observer to the potential impact, and the landscape context of that relationship.* Viewer characteristics assessed included viewer location (distance), viewer geometry (superior, inferior, or at grade), and viewer duration or exposure (BLM 1986). The landscape context included consideration of landscape type – i.e., focal or panoramic.

(ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 150 of 570; emphasis added.)

202. In the Proposed Order, the Department outlined Idaho Power's three-part process for implementing its visual impact methodology and assessing impacts to resources as follows:

(1) Evaluation of baseline conditions, which involved collecting information related to:

- a. Scenic Quality and Attractiveness. The characteristic is assigned a score or ranking, based on the BLM and USFS methods.
- b. Landscape Character. This is a USFS system. The BLM does not use a "landscape character" classification, so this information was assessed for all protected areas based on the USFS system.

c. Viewer groups and characteristics.

(2) Impact likelihood and assessment, which involved the following assessment criteria:

- a. Likelihood of impact;⁷³
- b. Magnitude of impact – duration;
- c. Magnitude of impact – visual contrast and scale domination;⁷⁴ and
- d. Magnitude of impact – resource change and viewer perception.⁷⁵

(3) Consideration of intensity, causation, and context (based upon Council's definition of "significant" OAR 345-001-0010(52)).

- a. Impact intensity⁷⁶
- b. Degree to which the possible impacts are caused by the proposed action
- c. Context⁷⁷

⁷³ The Council's definition of "significant" requires that the applicant consider both the magnitude and likelihood of a potential impact. For purposes of its analysis, Idaho Power assumed that any identified potential impact was likely to occur. (Kling Rebuttal Test. at 38.)

⁷⁴ Visual contrast is the extent to which an object appears different from the surrounding environment. Idaho Power measured visual contrast objectively by considering form, line, color, and texture. (Kling Rebuttal Test. at 40.) Scale dominance is the scale of an object relative to elements of the landscape that form its setting. Idaho Power assessed scale dominance based on whether the project feature was dominant, co-dominant, or subordinate in relation to the landscape. (*Id.* at 41-42.)

⁷⁵ Idaho Power used the magnitude determination to evaluate the level of resource change. Idaho Power assessed viewer perception as low, medium or high based on the location of the viewer relative to the potential medium to high magnitude impact. (Kling Rebuttal Test. at 45.)

⁷⁶ Idaho Power relied on resource change and viewer perception to determine the intensity of the potential visual impact. (Kling Rebuttal Test. at 46.) If a potential impact would result in low resource change, then Idaho Power concluded the potential impact was low. Similarly, if the potential impact would result in a high degree of resource change, then Idaho Power determined the impact high intensity. However, if the potential impact would result in a medium resource change, but viewers' perception of that change would be high, then Idaho Power considered it to be a high-intensity potential impact. For other impacts causing medium resource change with either a low or medium degree of viewer perception, Idaho Power considered the impact as of medium intensity. (*Id.* at 47.)

⁷⁷ The context of an impact refers to the role of scenery as a valued attribute of the resource in question and the extent to which expected impacts are consistent with the standards and guidelines of relevant land management objectives. Idaho Power considered a potential medium or high-intensity impact significant

d. Potential significance. "Significance" was determined based on if the valued scenic attributes of the protected area could persist, or not, based on the proposed facility's potential impact.⁷⁸

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 279 of 10016.) Idaho Power found a high-intensity impact to be potentially significant for purposes of its visual impact analysis if the affected resource no longer provided the valued scenic attributes for which it was deemed important. In short, to be considered significant, a potential impact had to: (1) be high intensity; (2) preclude the impacted resource's ability to provide the scenic value for which the resource was designated or recognized in the applicable land management plan; and (3) last for a duration of at least 10 years. (Kling Rebuttal Test. at 49.)

203. In the Proposed Order, the Department concurred with Idaho Power's methodology for assessing visual impacts and recommended that Council, in its review, concur with the methodology. The Department identified the following reasons for its concurrence:

- The proposed facility would cross both BLM and USFS land, and on those lands, the applicant is required to utilize those agency's respective visual resource impact assessment methods;
- Both the BLM and USFS approved the proposed facility location in its ROD(s), indicating compliance with the respective visual impact methodologies and standards;
- The applicant adapted each of the methodologies to use evaluative criteria based upon the Council's definition of "significant" under OAR 345-001-0010(53);
- The BLM and USFS visual impact methodologies provide an objective system to evaluate visual impacts;
- Using the BLM and USFS methods to assess visual impacts to EFSC protected areas is consistent with the statutory direction at ORS 469.370(13) to conduct a site certificate review in a "manner that is consistent with and does not duplicate the federal agency review."

if scenic values were a valued aspect of the affected resource and the project's impacts would preclude the resource from continuing to provide those values. (Kling Rebuttal Test. at 47.)

⁷⁸ For its scenic resources analysis, Idaho Power considered all identified resources to include scenery as a valued asset. (Kling Rebuttal Test. at 49.) For resources analyzed under either the Protected Areas or Recreation Standards, Idaho Power reviewed whether scenery was included as a perceived amenity of those sites. For example, the Ladd Marsh Wildlife Area was determined not to include scenery as a valued attribute, because that resource was designated as a protected area to provide habitat benefits for various species and none of Ladd Marsh's management goals included protections for scenery. Because the potential visual impacts from the Project would not preclude Ladd Marsh from providing the wildlife-oriented benefits identified in its management plan, Idaho Power found those potential impacts to be less than significant. (*Id.* at 49.)

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 279-280 of 10016.)

Visual impacts in the vicinity of the NHOTIC

204. The National Historic Oregon Trail Interpretive Center (NHOTIC) is located on top of Flagstaff Hill and has extensive background views to the west across Baker Valley to the Blue Mountains and to the southeast across Virtue Flat. The NHOTIC facility includes a visitor center, a theater, and a gift shop. There are also outdoor exhibits. There is a trail network within the NHOTIC parcel that provides visitor access to areas within the Area of Critical Environmental Concern (ACEC). Panorama Point is a lookout established outside of the NHOTIC parcel but included as a recreational opportunity within the NHOTIC. This lookout directs view to the west, which would be towards the proposed facility. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 423 of 10016.)

205. The NHOTIC ACEC parcel is both a scenic resource as described in OAR 345-022-0080 and a protected area as described in OAR 345-022-0040. In the ASC, Idaho Power assessed the NHOTIC ACEC parcel under the Scenic Resources standard, the Protected Area standard, and the Recreation standard. In the Proposed Order, the Department noted that the NHOTIC ACEC parcel is 507 acres, managed by the BLM for the preservation of its unique historic resource and visual qualities, and characterized by high recreational use. The Proposed Order found as follows:

The proposed facility would be located within one mile of the NHOTIC main building and within 130 feet of the western boundary of the NHOTIC Parcel. Potential visual impacts of the proposed facility within the NHOTIC parcel would include visual impacts from intermittent views of transmission structures, typically from elevated vantage points. Taking into account the mitigation discussed below and in this order, the applicant states that the proposed facility would introduce low to medium magnitude impacts depending on tower and viewer location within the NHOTIC parcel. The highest magnitude impacts, evaluated as medium, would be experienced from the western portion of the parcel near Panorama Point and level 2 and 3 trails, as presented in ASC Exhibit L Attachment L-4, photo simulations 5-25C, and 5-25D. Views of the proposed facility would be experienced from an elevated vantage point and would be predominantly peripheral or intermittent such that viewer perception would be up to medium. *Impacts would slightly reduce the scenery adjacent to the NHOTIC parcel but would not alter the overall scenic quality of the NHOTIC parcel such that resource change would be medium.* As described above, based on descriptions in the ASC Exhibits S and L and based upon staff familiarity of the site, the Department concurs with the applicant's conclusion that the proposed facility would be one of several developments contributing to the overall landscape character and quality, therefore the existing landscape character would be retained within the boundary of the ACEC and resource change would be medium.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 283 of 10016; emphasis added.)

206. The Department further found as follows:

[T]he NHOTIC parcel was designated to preserve the unique historic resource and visual qualities. The Oregon Trail ACECs, including NHOTIC, were specifically designated to preserve the unique historic resource, the Oregon Trail, and visual qualities within this geographic area. Because no development is proposed within a half mile corridor centered on the Oregon Trail within the ACEC, the resource values for which the NHOTIC parcel was designated to protect would not be impacted by the proposed transmission line. Additionally, recommended Historic, Cultural, and Archaeological Resources Condition 1 would require that the proposed facility avoid direct impacts to Oregon Trail and National Historic Trail resources. The number of towers visible would also vary depending on viewer position within the ACEC. As discussed in detail in ASC Exhibit L, to mitigate for potential visual impacts, the applicant proposes to use a modified tower structure, consisting of H-frame structure type with a natina (brown-weathered coloring) for towers proposed to be located directly west of the NHOTIC. There is an existing H-frame 230 kV transmission line in this area, visible from NHOTIC, and the proposed modified tower structure in this location would reduce visual impacts of the proposed facility by mimicking the existing H-frame 230 kV transmission line, though the proposed facility would have larger structures and would be made of steel, not wood.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 284 of 10016.)

207. As to the proposed facility's visual impacts to the NHOTIC, the Department concluded as follows:

[T]he Department notes that in its Record of Decision (ROD), the BLM has authorized the proposed facility in this area, which is an important consideration because the BLM is the landowner and manager of NHOTIC. The EFSC Protected Areas standard adopts as protected areas those areas that are designated by other government agencies, including BLM ACECs. As such, by authorizing the route in ROD, the federal agency (BLM) that administers the Management Plan for NHOTIC is authorizing the placement of the proposed facility in this location, and above-ground as permissible within the scenic designations in the Management Plan. Considering that the agency that manages the NHOTIC land and has identified the NHOTIC as having significant or important scenic value has authorized the proposed facility in the location proposed in the ASC, the Department considers this relevant information with regard to the EFSC Protected Areas standard. Based on this analysis, and considering the recommended mitigation, the Department recommends that the Council find that visual impacts

to the protected area would be less than significant.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, age 287 of 10016.)

208. To reduce potential impacts to the Oregon Trail ACEC – NHOTIC Parcel, NHOTIC recreation site, and VRM II area, and to incorporate the proposed mitigation measures, the Department recommended that the Council include the following condition:

Recommended Scenic Resources Condition 3: At final facility design, the certificate holder shall select transmission structures, to be constructed in the vicinity of the National Historic Oregon Trail Interpretive Center between approximately Milepost 145.1 and Milepost 146.6, with the following design modifications:

- a. H-frames;
- b. Tower height no greater than 130 feet; and
- c. Weathered steel (or an equivalent coating).

Additionally, the certificate holder shall construct the facility using tower structures that meet the following criteria between approximately Milepost 146.6 and Milepost 146.7:

- a. H-frames;
- b. Tower height no greater than 154 feet; and
- c. Weathered steel (or an equivalent coating).

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 424 of 10016.)

209. In the ASC, Idaho Power assessed potential impacts from the viewpoint KOPs 5-25d at NHOTIC. Idaho Power also assessed potential impacts from KOP 5-25c, located outside the NHOTIC. Idaho Power identified an additional KOP, 5-25e, near the visitor center. Idaho Power assessed potential impacts of the Flagstaff Hill Alternatives from this KOP using a photo simulation in preparation for the ASC. In the ASC, Idaho Power assessed potential impacts from this KOP, but did not prepare a separate photo simulation of the potential impacts. In response to concerns raised by limited parties, Idaho Power also developed a video animation to better assess potential project visibility from level 3 trails located in the western portion of the ACEC. These animations confirmed Idaho Power's conclusions presented in the ASC that impacts would be greater in this portion of this ACEC, but also illustrated the limited visibility of the project from areas around the visitor center and level 1 and 2 trails. Idaho Power selected these KOPs to demonstrate how the visual impacts from the project will vary at different sites throughout the NHOTIC. Idaho Power selected KOPs near the main NHOTIC building, where visitor traffic is heavy, to represent recreational visitors to the NHOTIC. KOP 5-25c is located at the Panorama Point viewing platform near the westernmost boundary of the NHOTIC—which is the area closest to the project. (Kling Rebuttal Test at 55-56; Kling Rebuttal Exhibits J and J3.)

210. For the contested case record, Idaho Power's environmental research and planning

expert, Louise Kling, prepared a photo simulation depicting the visual impacts to NHOTIC based on Idaho Power's proposed mitigation via design changes. Kling Exhibit D shows the visual impacts resulting from lattice structures and H-frame structures with a comparison of the visual simulations of the transmission line with and without mitigation. (Kling Rebuttal Test. at 63-64; Kling Rebuttal Ex. D.)

211. Limited party Carbiener's land use and environmental planning expert, Isobel Lingenfelter, created a 3-dimension model of the NHOTIC and surrounding area and used photogrammetry software to create a representation of the proposed project in the area, using 129.37 feet-high H-frame towers at regular intervals 900 feet apart. (Lingenfelter Test., Exhibits 1-35.)

Visual impacts at Morgan Lake Park

212. Morgan Lake Park is a regional park provided by the City of La Grande Parks and Recreation Department. The park is approximately 204.5 acres and located outside the city limits, approximately three miles southwest of La Grande. The park includes two lakes, Morgan Lake and Little Morgan Lake (also known as Twin Lake). (Kling Rebuttal Test. at 76.) Park facilities include 12 campsites, 5 barbeque pits, 4 fishing piers, a restroom, a boat launch, and a floating dock. There is no fee for camping and no motors are allowed on the lake. (ODOE - B2HAPPDoc3-37 ASC 20_Exhibit T_Recreation_ASC 2018-09-28, page 18 of 291.) Recreational activities at the park include camping, fishing, hiking, wildlife study, bird watching, and stargazing. (McAllister Direct. Test. at 3-5.)

213. With regard to the Recreation standard, in the Second Amended Project Order, the Department ordered, in pertinent part, as follows:

The application shall analyze the importance of recreational opportunities in the analysis area using the factors listed in OAR 345-022-0100(1), discuss any significant potential adverse impacts to important recreational opportunities, and describe measures proposed to avoid, minimize or mitigate those impacts. Please list all recreational opportunities in the analysis area and the applicant's analysis of whether those recreational opportunities are considered "important" or not.
* * * A visual impact assessment is required as part of Exhibit T; while no specific methodology is required by EFSC rule, the applicant must demonstrate why the proposed facility is [in] compliance with the Recreation standard. Visual simulations or other visual representations are not required, but can provide important evidence for use by the Department and Council in understanding the potential visual impact of the proposed facility to important Recreation sites.

(ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 22 of 29.)

214. The proposed project will not cross any portion of Morgan Lake Park and therefore will not result in any permanent displacement of any recreational uses associated with the park. Both the Proposed Route and the Morgan Lake Alternative are near Morgan Lake Park. The Proposed Route is located 0.6 mile to the north of the park at its closest point. The Morgan Lake

Alternative passes approximately 0.2 miles from Morgan Lake Park at its closest point. (Kling Rebuttal Test. at 79.)

215. In ASC Exhibit T, as required by OAR 345-021-0010(1)(t),⁷⁹ Idaho Power evaluated potential impacts to Morgan Lake Park as an important recreational opportunity in the project area.⁸⁰ (ODOE - B2HAPPDoc3-37 ASC 20_Exhibit T_Recreation_ASC 2018-09-28, page 32 of 291.) In summarizing the visual impacts to Morgan Lake Park, Table T-1 notes: “Vegetation will block views of the towers from most locations in the park. The cleared right-of-way will not be visible. Viewers could experience weak contrast from the Project while engaging in transient or stationary activities.” (*Id.*)

216. In Exhibit T, Attachment T-4, Visual Impact Methodology and Analysis, Idaho Power stated as follows:

The Proposed Project will result in long-term visual impacts to Morgan Lake Park. Impacts will be medium intensity as measured by visual contrast and scale dominance, resource change, and viewer perception. Visual impacts will not preclude visitors from enjoying the day use and overnight facilities offered at the Morgan Lake Park. Therefore, visual impacts to Morgan Lake Park will be **less than significant**.

(ODOE - B2HAPPDoc3-37 ASC 20_Exhibit T_Recreation_ASC 2018-09-28, page 155 of 291; emphasis in original.)

217. On August 20, 2019, Idaho Power executed the MOA with the City of La Grande to provide further mitigation of potential impacts to Morgan Lake Park resulting from the proposed facility along the Morgan Lake Alternative. As found above, Idaho Power agreed to provide \$100,000 to the City of La Grande if the Company constructs the Morgan Lake Alternative. The City of La Grande and Idaho Power agreed that the funds are primarily intended for recreational improvements at Morgan Lake Park (*e.g.*, day use area improvements, toilet upgrades, a new entry gate).⁸¹ The funds are not specifically intended to mitigate for visual impacts. To mitigate for the visual impacts to Morgan Lake Park, the Proposed Order includes Recommended Recreation Condition 1, set out above. (Kling Rebuttal Test. at 82.)

⁷⁹ OAR 345-021-0010(1)(t) requires that the ASC include as Exhibit T, “[i]nformation about the impacts the proposed facility would have on important recreational opportunities in the analysis area, providing evidence to support a finding by the Council as required by OAR 345-022-0100[.]”

⁸⁰ Idaho Power did not assess Morgan Lake Park under the Scenic Resources standard or the Protected Areas standard because the Park is not identified as a significant or important scenic resource in any local land use plan as required by the Scenic Resources standard (OAR 345-022-0080) and does not fall within any of the categories listed in the Protected Areas standard (OAR 345-022-0040(1)). (Kling Rebuttal Test. at 77-78.)

⁸¹ (*See* ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 250-51 of 10016, discussing the MOA and Recommended Land Use Condition 17.)

218. In November 2019, in response to comments received on the Draft Proposed Order (DPO), Idaho Power performed a supplemental analysis of Morgan Lake Park under the Recreation standard, including an updated visual impacts analysis. In the supplemental analysis, Idaho Power addressed the following impacts: (1) Direct or indirect loss of a recreational opportunity as a result of facility construction or operation; (2) Noise resulting from facility construction or operation; (3) Increased traffic resulting from construction or operation; and (4) Visual impacts of facility structures. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7698 of 10016.)

219. With regard to loss of recreational opportunities, the supplemental analysis states:

The Project will not cross any portion of Morgan Lake Park and therefore will not result in any permanent displacement of any recreational uses associated with the park. During construction, there could be temporary, intermittent access delays when Morgan Lake Road or other access roads are controlled for safety purposes to accommodate construction vehicles and equipment. However, any delays getting to the park are expected to be only intermittent and short in duration (i.e., not lasting longer than 30 minutes), and access within the park will not be affected at all. Therefore, the project will result in any direct or indirect loss of recreational opportunity.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7698 of 10016.)

220. With regard to noise resulting from facility construction or operation, the supplemental analysis notes that the park would experience some level of short-term noise impacts during construction. During operation, potential sources of noise would be maintenance activities and corona noise. Idaho Power explained its methodology for estimating increase in sound levels and frequency of exceedances. The supplemental report notes that, “during typical operating conditions, corona noise is estimated at 27 dBA at the edge of the transmission line right of way, and this level of sound (or lower) would be representative of sound levels at the park during fair weather conditions. Twenty-seven dBA is a low level and would not cause a significant noise impact to any recreation opportunity.” (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7699 of 10016.) Idaho Power further concluded that “the low-level of corona noise, during infrequent weather conditions, is unlikely to cause a significant noise impact at Morgan Lake Park.” (*Id.* at 7701 of 10016.)

221. As for traffic impacts, Idaho Power concluded that any traffic impacts will be temporary in nature and not result in a significant adverse impact to recreation resources, including Morgan Lake Park. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7702 of 10016.)

222. In addressing visual impacts in the supplemental analysis, Idaho Power explained as follows:

Idaho Power first notes that Morgan Lake Park is considered in the EFSC process as *an important recreation opportunity and evaluated for compliance with the Council's Recreation Standard*, but is not separately evaluated as a Scenic Resource because the applicable management plan for Morgan Lake Park, the Morgan Lake Recreational Use and Development Plan, did not identify Morgan Lake Park as an important scenic resource. Accordingly, while Idaho Power did evaluate potential visual impacts associated with the project, it is important to also note that, per the Morgan Lake Recreational Use and Development Plan, there are no specific scenic views or values associated with the Morgan Lake Park that are regarded as particularly important for purposes of compliance with the Recreation Standard. Idaho Power's analysis of visual impacts focused on the elements of Morgan Lake Park that are most important for the recreation activities at the park, which include camping, picnicking, fishing, and boating.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7702 of 10016; emphasis added.)

223. Idaho Power further explained:

Views of the Project will be experienced from a neutral position and will be peripheral and head-on, intermittent and continuous depending on viewer position and activity. As mentioned above, vegetation will block views of the towers from most locations in the park (including Morgan Lake), so viewer perception would be intermittent and peripheral while viewers are moving through the park. However; popular park activities (picnicking, fishing, and camping) are stationary and views experienced during those activities would be continuous and/or head-on, depending on the location of the particular activity. The only recreational facility at Little Morgan Lake is a short foot trail between Morgan Lake and Little Morgan Lake, thereby limiting viewers to areas primarily located east of Little Morgan Lake near the foot trail. Therefore, viewer perception from Little Morgan Lake would be medium due to location of viewers. The cleared ROW of the Morgan Lake Alternative will not be visible from Morgan Lake Park. Visual contrast will vary from weak to strong throughout the park, depending on the level of vegetation screening provided at each location. Resource change would be high and viewer perception would be moderate. There will be no Project facilities within the boundary of Morgan Lake Park. Scenic attractiveness and landscape character would be reduced and scenic integrity will be reduced to moderate such that resource change would be high. Although high intensity visual impacts could occur to Morgan Lake Park, they would not occur in primary recreation areas concentrated around the shore of and on Morgan Lake.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7703 of 10016.) With regard to the proposed facility's long-term visual impacts to Morgan Lake Park, Idaho Power concluded:

Impacts will be high intensity in some areas of the park as measured by visual contrast and scale dominance, resource change, and viewer perception. Visual impacts will not preclude visitors from enjoying the day use and overnight facilities offered at the Morgan Lake Park as high intensity impacts will occur in areas of the park managed for wildlife habitat not recreation. Therefore, visual impacts to Morgan Lake Park will be less than significant.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 7710-11 of 10016.)

224. In section IV.L of the Proposed Order, the Department recognized Morgan Lake Park as an important recreation opportunity and evaluated Idaho Power's impact assessment of the park and 20 other identified important recreational opportunities. The Department noted that Idaho Power assessed visual impacts to important recreational opportunities using the methodology described in Exhibit L (Protected Areas) and Exhibit R (Scenic Resources). (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 520 of 10016.)

225. In its discussion of Morgan Lake Park as an important recreational opportunity, the Department stated as follows:

Both the applicant and the City of La Grande provided comments on the DPO identifying that, in light of the City's continued opposition to the proposed facility in Union County, the City and applicant executed a Memorandum of Agreement (MOA) outside the EFSC process. Part of the MOA addresses the City's concerns about potential impacts at Morgan Lake Park, if the Morgan Lake alternative is selected for construction. The City and applicant agreed that, if this route is selected, the applicant would provide the City with \$100,000 for recreational improvements at Morgan Lake Park. The improvements include upgrades to the access road to the Park as well as a new entry gate, the installation of new vault toilets at the campground, day use improvements, signage, and other improvements to the recreational opportunities within the Park.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 528 of 10016.)

226. In addressing the visual impacts of the proposed facility at Morgan Lake Park, the Department found as follows:

[B]ased on the applicant-modeled H-frame towers in specific locations and to reduce the overall potential visual impacts to the affected human population of user of the Morgan Lake Park recreational opportunity, the Department recommends that Council include the following condition as Recreation Condition 1:

Recommended Recreation Condition 1: If the Morgan Lake alternative facility route is selected, the certificate holder shall construct the facility using tower structures that meet the following criteria for the transmission line that would be visible from Morgan Lake Park, specifically between milepost (MP) 6.0 to MP 6.9 miles 5-7 of the Morgan Lake alternative, as shown on ASC Exhibit C, Attachment C-3, Map 8.

- a. H-frames;
- b. Tower height no greater than 130 feet; and
- c. Weathered steel (or an equivalent coating).

Based on the analysis presented here, the Department recommends that the Council find that the proposed Morgan Lake alternative facility with recommended mitigation would not cause a significant adverse impact to the recreational opportunities at Morgan Lake Park.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 531-32 of 10016.)

227. The Policy Statement in the Morgan Lake Plan provides, in pertinent part:

Morgan Lake Park shall be managed and improved in a manner consistent with the objective of providing a quality outdoor recreational experience harmonious with a natural forest and lake area (as opposed to typical city park activities). Example activities consistent with this objective include fishing, bird watching, nature study, boating, but do not include baseball, motor bike trails, hunting, shooting, or playground activities using swings, merry-go-rounds, slides, etc.

A goal of minimum development of Morgan Lake Park should be maintained to preserve the maximum of natural setting and to encourage solitude, isolation, and limited visibility of users while at the same time providing safe and sanitary condition for users.

(McAllister Ex. 4 at 6.)

228. For the contested case record, Idaho Power's expert Ms. Kling revisited Idaho Power's supplemental analysis of Morgan Lake Park to address the limited parties' concerns that Idaho Power did not assess undeveloped areas within the park that support recreation activities such as birdwatching and nature study. (Kling Rebuttal Ex. E.) The Revised Supplemental Analysis provides an assessment of both developed and undeveloped areas,⁸² with consideration

⁸² The Revised Supplemental Analysis states, in part:

The project will be visible from approximately 16 percent of the Park, and primarily from the access road and day-use parking areas located to the south of Morgan Lake, and undeveloped areas west and south of Little Morgan Lake. * * * .

of additional mitigation that expands the use of H-frames between milepost 5 and 8. Idaho Power applied this additional mitigation to provide more continuity in tower type with the viewshed of Morgan Lake Park, and to reduce tower heights such that they would not be visible from the majority of campsites and the boat launch. (Kling Rebuttal Test. at 83.) Ms. Kling also developed a video animation to evaluate further the project's potential impacts to undeveloped recreation opportunities at Morgan Lake Park. The animation allows the viewer to determine the extent to which project features would be visible from areas not previously included in the ASC (the prior analysis focused on developed recreation opportunities). (Kling Rebuttal Test. at 79-81; Kling Rebuttal Ex. F.)

229. The Revised Supplemental Analysis discussed the magnitude of the proposed facility's impact on Morgan Lake Park in terms of duration, virtual contrast and scale dominance, resource change and viewer perception. As pertinent here, the Revised Supplemental Analysis noted:

[Visual Contrast and Scale Dominance] Though much of the park will have no to low visibility, visual contrast will be moderate to high where the towers are not screened. High visual contrast will be limited to the southern portions of the Park, and areas located along the western edge of Little Morgan Lake. In these areas, towers will appear co-dominant to dominant within the landscape. Therefore, impact magnitude for the park as a whole will be medium-high.

[Resource Change] The landscape character and scenic attractiveness of the park will be maintained in the northern portion, where developed recreation opportunities will be located. The majority (84 percent) of Morgan Lake Park and

For the most part, areas located north of Morgan Lake would have limited views of transmission towers, with exposure either precluded by vegetation, or minimized as a result of the combined effects of vegetation screening or backdrop provided by topography []. The landscape in these areas would appear similar to existing conditions, with broad, unobstructed, panoramic views extending to the north, east, and west []. Views to the south would appear enclosed due to the presence of the conifer stands along the southern perimeter of the lake, as is experience under existing conditions [].

One tower would be fully visible from a short segment of trail connecting Morgan Lake and Little Morgan Lake, and dispersed areas to the north []. The tower would contrast against the existing landscape at a weak to moderate level as a result of the backdrop provided by the hillside, and the consistency in vertical line with surrounding trees. Along the north side of Morgan Lake, tops towers would be visible to the west on approach to the west side of the lake, though viewer exposure from within the park would be limited to the top of the towers and with partial screening from vegetation lake [].

From the northwestern side of Little Morgan Lake, multiple towers with the potential for skylining could be seen []. Visual contrast in these areas is anticipated as moderate due to the skylining []. * * * As disclosed in the ASC, high magnitude impacts are expected in areas south of Morgan Lake and Little Morgan Lake due to the proximity of the Project and the lack of screening.

(Kling Rebuttal Ex. B at 6-12, embedded photos and citations to Exhibit F1, F2 and F3 omitted.)

its recreational features (campsites, fishing piers, and floating dock) will be screened from views of the Project []. In areas of dispersed or undeveloped recreation in the southern portion of the park, scenic integrity will be reduced to a moderate level for the majority of areas; however, integrity would be reduced to low in the southern portion of the Park, particularly in day use areas along the Sheep Creek Trail. Therefore, resource change of Morgan Lake Park as a whole will be medium.

[Viewer Perception] Viewer perception will range from low to high throughout Morgan Lake Park. Views of the Project will be experienced from a neutral position and will be equally peripheral and head-on and range from intermittent to continuous. Therefore, viewer perception for the park as whole will be medium.

(Kling Rebuttal Ex. B at 14-15; emphasis in original.)

230. Like the prior analyses, the Revised Supplemental Analysis referenced the Morgan Lake Plan objectives, and considered scenery as a valued attribute of the recreation opportunity. (Kling Rebuttal Ex. B at 17.) The Revised Supplemental Analysis also noted that while the project will introduce moderate contrast to the landscape and high visual contrast in discrete areas in the southern portion of the park, it would not preclude visitors from enjoying the recreation opportunities offered at the park. The Revised Supplemental Analysis concluded:

The Proposed Project will result in long-term visual impacts to Morgan Lake Park, primarily in the southern periphery of the park. Impacts will be of varying intensity as measured by visual contrast and scale dominance, resource change, and viewer perception. Visual impacts will not preclude visitors from engaging in the recreational opportunities offered at Morgan Lake Park, including the undeveloped or developed (day use and overnight facilities) opportunities. Therefore, visual impacts to Morgan Lake Park will be less than significant.

(*Id.*)

231. In response the limited parties' concerns regarding potential visual impacts to undeveloped areas within Morgan Lake Park, Idaho Power proposes using H-frame towers on the Morgan Lake Alternative between milepost 5 and milepost 8 in the vicinity of the park. (Kling Rebuttal Test. at 80; Kling Rebuttal Ex. E.)

Findings related to the Retirement and Financial Assurance standard

232. In the Second Amended Project Order, Section III(m) the Department stated as follows with regard to Exhibit M of Idaho Power's application for site certificate (ASC):

To find that the proposed transmission line satisfies the Financial Assurance Standard (OAR 345-022-0050(2)), the Council must find that the applicant has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition.

The application shall include the type and amount of the applicant's proposed bond or letter of credit to satisfy the requirements of OAR 345-022-0050.

The applicant shall propose a bond or letter of credit in a form and amount adequate to restore the site to a useful, non-hazardous condition in the event construction of the transmission line is not completed or if the transmission line were to be retired. Recognizing that the permanence of the transmission line can be less certain as circumstances change and technology evolves over time, it is recommended that the applicant submit a proposal that recognizes the increased risks associated with changing circumstances and/or an aging facility, and proposes a bonding mechanism commensurate with that risk.

The application shall include a proposed mechanism by which the certificate holder can keep the Council apprised of the condition of the transmission line, evolving transmission technology, and the line's performance in the context of the larger northwest power grid; an age at which a bond would become warranted to provide adequate restoration assurance in the event the transmission line were to be retired or decommissioned; and the amount, or graduated amount, of that bond.

(ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 17 of 29.)

233. In accordance with the Second Project Order, Idaho Power, in ASC Exhibit M, set out its proposed approach for satisfying the Financial Assurances standard (proposed type and amount of bond or comparable security) and evidence of reasonable likelihood of obtaining security in the event the project would be retired. Idaho Power proposed that it obtain and maintain a bond or letter of credit during the construction phase of the project and after the project has been in service for 50 years. (ODOE - B2HAPPDoc3-21 ASC 13_ Exhibit M_Financial Capability_ASC 2018-09-28, pages 1-11 of 19.)

234. In ASC Exhibit M, Idaho Power provided evidence that it has the capability to finance the construction of the project and meet the requirements for retirement and restoration of the project site. Idaho Power explained that it is a vertically integrated, regulated utility that operates a large fleet of assets, including generation, transmission, and distribution facilities and that it has remained in business without interruption or default for nearly 100 years. Idaho Power noted, among other things, that it is a rate-regulated utility under the jurisdiction of the Idaho PUC and the Oregon PUC and the rates set by both state commissions include the costs associated with retiring facilities that are taken out of service. Idaho Power reported that it maintains credit ratings that have historically enabled it to access secured and unsecured debt at reasonable rates and under acceptable terms. Idaho Power also noted that it has in place a \$300 million credit facility with a syndicate of large financial institutions, with a termination date of October 2022, and that it may, when necessary, obtain capital contributions from IDACORP, Inc., Idaho Power's parent entity. (ODOE - B2HAPPDoc3-21 ASC 13_ Exhibit M_Financial Capability_ASC 2018-09-28, pages 11-12 of 19.)

235. In ASC Exhibit M, Attachment M-2, as evidence of its financial capability to obtain a letter of credit in the amount of the retirement, decommissioning and site restoration costs,

Idaho Power submitted a letter from Wells Fargo Bank. The Wells Fargo letter states the bank's willingness to furnish or arrange a letter of credit to cover the full costs of retiring the project and returning the site to a useful and non-hazardous condition:

Based upon Idaho Power's current credit ratings, profile and information we have as of the date hereof and subject to acceptable pricing, terms and requisite internal approvals, and assuring no market disruption, Wells Fargo confirms to you that it would be highly interested in arranging (as administrative agent or under the existing credit facility or otherwise) and believes it would be successful in arranging, a syndicated letter of credit in an amount up to \$141 million for a period not to exceed three years (the LC Facility) for the purpose of ensuring Idaho Power's obligation that the site of the Boardman-to-Hemingway transmission project be restored to a useful and non-hazardous condition.

(ODOE - B2HAPPD0c3-21 ASC 13_ Exhibit M_ Financial Capability_ ASC 2018-09-28, page 19 of 19.)

236. In ASC Exhibit W, Idaho Power provided information about site restoration following cessation of operation of the facility. Idaho Power estimated that the useful life of the proposed facility will be in excess of 100 years.⁸³ Idaho Power addressed site restoration activities, and asserted that such activities would be done in accordance with a Council-approved retirement plan. Idaho Power also addressed site restoration costs, and estimated that, should the facility be retired, the total cost of restoring the site to a useful, non-hazardous condition is \$140,902,000 in 4th quarter 2016 dollars. In addition, Idaho Power proposed site certificate conditions to ensure compliance with the relevant Council standards pertaining to retirement and financial assurance. Idaho Power submitted, as ASC Exhibit W, Attachment W-1, its cost estimate for removal and site restoration. (ODOE - B2HAPPD0c3-40 ASC 23_ Exhibit W_ Retirement_ ASC 2018-09-28, pages 1-28.)

237. In ASC Exhibit W, and as required by OAR 345-027-0020(9), Idaho Power set out its plan for restoring the site to a useful, non-hazardous condition in the event of cessation of construction or operation. In ASC Exhibit W, Attachment W-1, Idaho Power explained that site restoration would involve removal of the transmission line (including all support structures, conductors, overhead shield wires, and communication sites) and the following components at the switching station: interconnecting bus system, switches, breakers, and instrumentation for the control and protection of the equipment. Idaho Power noted that its retirement plan will provide for removal of the cement foundations for each support structure to a depth of one foot below grade (depending on ground slope), except that any foundations located in land zoned Exclusive Farm Use (EFU) will be removed to a depth of three feet below grade.⁸⁴ (ODOE -

⁸³ The risk that the proposed facility would need to be retired is extremely low. From a practical standpoint, a 500 kilovolt ("kV") transmission line is designed, constructed, and operated to be in-service in perpetuity. From an accounting perspective, the useful life of a transmission line is 100 years. (Ellsworth Rebuttal Test. at 4-6.)

⁸⁴ Idaho Power proposed removing footings to a depth of one foot below ground surface in areas outside EFU-zoned land because it is more environmentally impactful to completely remove the footings than to

B2HAPPDoc3-40 ASC 23_Exhibit W_Retirement_ASC 2018-09-28, page 7 of 28; *see also* ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 300 of 10016.)

238. In the Proposed Order, the Department found that a 100-year lifetime is a reasonable estimated useful life for the proposed facility.⁸⁵ The Department also recommended that, based on the evidence in the record, the Council find that Idaho Power has the ability to restore the site to a useful, non-hazardous condition following permanent cessation of construction or operation of the proposed facility, subject to compliance with the recommended conditions set out therein. (ODOE - B2HAPPDoc2-1 Proposed Order on ASC and Attachments 2019-07-02, pages 299-302 of 10016.)

239. The Department reviewed Idaho Power's cost estimate and confirmed that the site restoration tasks, unit costs, labor rates, and cost estimate assumptions constitute a reasonable site restoration cost for the facility. The Department recommended that the Council find that \$140,779,000 (3rd Quarter 2016 dollars) is a reasonable estimate of an amount satisfactory to restore the site to a useful, nonhazardous condition. (ODOE - B2HAPPDoc2-1 Proposed Order on ASC and Attachments 2019-07-02, page 304 of 10016.)

240. In accordance with the Council rules requiring mandatory site certificate conditions related to the RFA standard,⁸⁶ the Department recommended conditions requiring Idaho Power to prevent the development of any conditions on the site that would preclude restoration of the site to a useful, non-hazardous condition and to retire the facility in accordance with a retirement plan approved by the Council if the Company permanently ceases construction or operation of the facility. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02,

leave in place the portion of the footings below one foot in depth. To maintain a safe and stable excavation site, each additional foot of removal depth increases the width of the excavation by two feet in each direction. Therefore, a 10-foot diameter footing removed to a depth of one foot would require a 14-foot diameter hole, whereas the same footing removed to a depth of three feet would require a 22-foot diameter hole, assuming 2:1 side slopes to prevent soils from caving into the hole and mixing with concrete debris. Idaho Power proposed a removal depth of three feet for footings in the EFU zone because of the concern that a one foot depth would provide insufficient clearance for farming equipment and for installation of irrigation. On farmland, concrete footings left in place could interfere with and damage equipment. (Ellsworth Rebuttal Test. at 38-39.)

⁸⁵ The Department found as follows:

The applicant explains that while components of transmission facilities may be replaced over time with new materials and hardware, the applicant designs, constructs, and operates the components of its transmission system for indefinite service. Based on the applicant's explanation of operating its transmission system for over 100 years and maintains it to operate it in perpetuity, the Department concurs that 100 year lifetime is a reasonable estimated useful life for the proposed facility.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 299-300 of 10016.)

⁸⁶ *See* OAR 345-025-0006(7), (8) and (9)

page 301 of 10016.) The Department also included Recommended RFA Condition 4 requiring Idaho Power to, among other things, submit a bond or letter of credit naming the State of Oregon, acting by and through the Council, as beneficiary or payee in an amount that will be increased on a quarterly basis to correspond with the cost of the construction over four years, to account for the total decommissioning cost for the facility. (*Id.* at 307-308.)

241. To satisfy mandatory condition OAR 345-025-0006(8)⁸⁷ the Department included Recommended RFA Condition 5, requiring that, once the facility is placed in service, Idaho Power maintain a bond or letter of credit as follows:

a. From the In-Service Date until In-Service Year 51, the amount of bond or letter of credit shall be \$1.00.

b. On the 50th anniversary of the In-Service Date, the certificate holder shall begin maintaining a bond or letter of credit in an amount that will increase on an annual basis for the next 50 years. In year 51, the amount of the bond or letter of credit will be set at one-fiftieth (1/50) of the total estimated decommissioning costs, adjusted for inflation, as specified in section (d) of this condition. Each year, through the 100th year of service, the bond or letter of credit shall be increased by one-fiftieth (1/50) of the estimated decommissioning costs. Once the bond or letter of credit is in an amount equal to 100 percent of decommissioning costs, it will remain at that level for the life of the facility.

c. On the fifth anniversary of the In-Service Date, and on each subsequent quinquennial thereafter, the certificate holder shall notify the Department 60 days prior and report to the Council in writing or in-person on the following subjects: (i) the physical condition of the facility; (ii) any evolving transmission or electrical technologies that could impact the continued viability of the facility; (iii) the facility's performance in the context of the larger power grid; and (iv) the certificate holder's general financial condition, including the certificate holder's credit rating at that time. * * * Based on the information provided in the 5-year report, and the Department's review and recommendations of such reports, the Council will consider whether the certificate holder should be required to post a bond or letter of credit that varies from the financial assurance requirements set forth in sections (a) and (b) of this condition. The certificate holder shall be subject to the Council's determination. The Council's determination may include extending the date on which the certificate holder would be required to begin posting the financial assurances set forth in section (b) of this condition.

d. The estimated total decommissioning cost for the facility is \$140,779,000 (3rd Quarter 2016 dollars), to be adjusted to the date of issuance of the bond or letter of credit in In-Service Year 51, and on an annual basis thereafter. Subject to Department approval, the certificate holder may request an adjustment of the bond

⁸⁷ OAR 345-025-0006(8) states, in pertinent part, "The certificate holder must maintain a bond or letter of credit in effect at all times until the facility has been retired. The Council may specify different amounts for the bond or letter of credit during construction and during operation of the facility."

or letter of credit amount based on final design configuration of the facility by applying the unit costs presented in, Attachment W-1 of the Final Order on the ASC, Facilities Removal and Site Restoration Cost Estimate. Such adjustments may be made without amendment to the site certificate. The Council authorizes the Department to agree to these adjustments in accordance with this condition. *

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 310-11 of 10016.)

242. The Department concluded:

Subject to compliance with Retirement and Financial Assurance Conditions 1 through 3, the Department recommends the Council find that the proposed facility can be restored adequately to a useful, non-hazardous condition following permanent cessation of construction or operation of the proposed facility. Subject to compliance with Retirement and Financial Assurance Conditions 4 and 5, the Department recommends that the Council find that the certificate holder has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 311 of 10016.) The Department therefore recommended that the Council find that the proposed facility, including the proposed and alternative routes, complies with the Council's Retirement and Financial Assurance standard. (*Id.* at page 312.)

243. On October 12, 2021, Idaho Power obtained an updated letter of willingness from Wells Fargo Bank. The updated letter proposes up to a five-year letter of credit to cover the entire construction period. The letter of willingness can be updated annually until it is replaced by a letter of credit or bond when construction begins on the project. (Mills Rebuttal Test. at 4; Mills Rebuttal Ex. B.)

244. A financial institution cannot agree to a letter of credit for an indefinite amount of time. Financial conditions may change that require adjustments to factors such as carrying costs associated with the letter of credit. Therefore, letters are typically approved for a term length of no more than a five-year period. Letters of credits/bonds can be repeatedly renewed to continue coverage through the required term length. For the proposed facility, the letter of credit may have a five year term and then Idaho Power and its lenders will renegotiate the letter of credit/bond terms prior to the term's end, to extend coverage for an additional five years. It is standard industry practice to renew letters of credit/bonds to extend through the necessary length of coverage. (Mills Rebuttal Test. at 5.)

245. Idaho Power has discussed the phased-in aspect of the letter of credit/bond set out in the Proposed Order (Recommended RFA Condition 5) with Wells Fargo. The bank confirmed that the quarterly incremental increase in the letter of credit as construction on the project progresses is an arrangement to which it is willing to agree. Idaho Power also discussed the

quarterly incremental approach with its bond surety provider, and it confirmed quarterly incremental increases were reasonable and not out of the ordinary. (Mills Rebuttal Test. at 6.)

Findings related to the Soil Protection standard

246. In the Second Amended Project Order, the Department ordered Idaho Power to provide the following information with regard to the Soil Protection standard:

The applicant shall include information describing the impact of construction and operation of the proposed facility on soil conditions in the analysis area. Describe all measures proposed to maintain soil productivity during construction and operation. It is recommended that the applicant consult with local farmers, landowners, soil conservation districts, and federal land managers regarding mitigation of impacts to agricultural and forest lands. Specific discussion could include weed encroachment, interference with irrigation equipment, and the potential for restrictions to aerial applications caused by the proximity of transmission towers.

Exhibit I shall also include the required evidence related to the federally-delegated National Pollutant Discharge Elimination System (NPDES) 1200-C permit application. * * *

If the applicant intends to rely upon an erosion and sediment control plan to meet the Soil Protection standard, provide a draft of the plan for review.

(ODOE - B2HAPPD0c15 ApASC Second Amended Project Order 2018-07-26, page 14 of 29.)

247. As required by OAR 345-021-0010(1)(i)⁸⁸ and the Second Amended Project Order, in ASC Exhibit I, Idaho Power identified the major soil types in the analysis area,⁸⁹ identified the current land uses that require or depend on productive soils, and identified and assessed the significant potential adverse impacts to soils from the project. (ODOE - B2HAPPD0c3-16 ASC 09a_ Exhibit I_ Soil_ ASC_ Part 1 2018-09-28, pages 13-27 of 115.) Idaho Power also explained that impacts to soils are limited because not all of the site boundary will be disturbed. In ASC Exhibit I states that, for the total proposed route, construction activities will disturb 21 percent (4,347.6 acres) of the site boundary, and that operation will disturb 3.6 percent (756.9 acres) of the site boundary. (*Id.* at page 17 of 115.) Idaho Power focused its quantitative soil analyses the construction disturbance area (CDA) and the smaller operation disturbance area (ODA). (Madison Rebuttal Test. at 9.)

⁸⁸ OAR 345-021-0010(1)(i) requires that the applicant provide, as Exhibit I, “[i]nformation from reasonably available sources regarding soil conditions and uses in the analysis area, providing evidence to support findings by the Council as required by OAR 345-022-0022[.]” In ASC Exhibit I, Table I-1 identified the soil orders within the site boundary, by acres for each county. (ODOE - B2HAPPD0c3-16 ASC 09a_ Exhibit I_ Soil_ ASC_ Part 1 2018-09-28, page 14 of 115.)

⁸⁹ For purposes of the Soil Protection standard, the analysis area means the area within the site boundary. (ODOE - B2HAPPD0c2 Proposed Order on ASC and Attachments 2019-07-02, page 99 of 10016.)

248. In ASC Exhibit I, Idaho Power explained its methods for identifying soil properties and its use of the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) State Soil Geographic Database (STATSGO) to characterize soil erosion and soil reclamation properties. (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 7 of 115.) Idaho Power noted that “when the final route has been selected and prior to construction, additional site-specific soil properties will be surveyed during the site-specific geotechnical investigation.” (*Id.*)

249. Idaho Power identified current land uses in the analysis area that require or depend on productive soils through analysis of high value farmland soils data and land cover type data. Idaho Power used SSURGO soils data to identify soils within the analysis areas that have potential for agricultural use. To characterize land cover types within the site boundary, Idaho Power used Regional Gap Analysis Project data along with desktop interpretation of 2012 National Agriculture Imagery Program imagery. (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 13 of 115; Madison Rebuttal Test. at 10-11.) Idaho Power noted that additional information regarding agricultural land uses is presented in the Agricultural Lands Assessment, ASC Exhibit K, Attachment K-1, which identifies the types of agriculture and the specific crops grown in the analysis area. (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 13 of 115.)

250. Because the proposed facility does not include cooling towers and has no effluent discharges, Idaho Power did not evaluate the potential adverse impact to soils from chemical factors such as salt deposition and land application of liquid effluent. (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 16 of 115; Madison Rebuttal Test. at 12.)

251. Idaho Power assessed the potential adverse impacts to soils from the Project due to erosion, loss of soil reclamation potential, compaction, chemical spills, and herbicide use. Idaho Power evaluated soil erosion potential based on four factors, the soil K factor (susceptibility to displacement by rainfall), wind, slope assessment, and the T factor (tolerance to remain productive). (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 9-10 of 115; Madison Rebuttal Test. at 13.) As for loss of soil reclamation potential, Idaho Power considered several soil properties, including soil compaction, the amount of stony-rocky soil, droughty soil, depth to bedrock, and the presence of hydric soils. (ODOE - B2HAPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 11-12 of 115; Madison Rebuttal Test. 17-18.) As for soil compaction, Idaho Power explained that its review of the STATSGO database indicated there were no highly compaction-prone soils within the site boundary, and therefore it did not quantify the impacts to highly compaction-prone soils. Idaho Power nevertheless addressed mitigation of compacted soils due to construction activities in Exhibit I. (*Id.*)

252. In ASC Exhibit I, Idaho Power also described the proposed measures to be taken to avoid or mitigate adverse impacts to soils. Idaho Power explained that as part of the siting process, the Company communicated with local, state, and federal entities, landowners, and other stakeholders to obtain input to minimize project impacts to irrigated agricultural lands and

other sensitive resources. In response to stakeholder communications, Idaho Power shifted the Proposed Route and included an alternative route for consideration. Idaho Power explained that it will conduct additional soil analysis during the final geotechnical exploration program and will consider the potential sensitivity of soils in designing and siting the facility. (ODOE - B2HAPPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 28 of 115.) Idaho Power added that it will minimize soil impacts by using best management practices (BMPs) and restoration efforts to restore soil surfaces and vegetation following disturbances.⁹⁰ (*Id.*) Idaho Power explained that the draft Reclamation and Revegetation Plan (ASC Exhibit P1, Attachment P1-3), sets out the measures to be used to ensure reclamation success in disturbed areas.⁹¹ (*Id.* at page 29 of 115.)

253. To address potential impacts to productive soils (privately owned agricultural lands), Idaho Power prepared an Agricultural Impacts Mitigation Plan (AIMP), which it incorporated into the Agricultural Land Assessment. (ODOE - B2HAPPDoc3-19 ASC 11_ Exhibit K_Land Use_ASC 2018-09-28, pages 430-37 of 614; Madison Rebuttal Test. at 27.) The AIMP identifies the measures Idaho Power will take to avoid, mitigate, repair and/or provide compensation for impacts that may result from the construction or operation of the facility on privately owned agricultural land. (*Id.*; Madison Rebuttal Test. at 27-28.)

254. As required by Council rules, Idaho Power included a draft monitoring plan for soil impacts during construction and operation. (ODOE - B2HAPPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 36-37 of 115.) In addition, Idaho Power proposed site certificate conditions to ensure compliance with the Soil Protection standard, including conditions requiring the Company to finalize and submit for Department approval the following plans: An Oregon DEQ-approved construction related Spill Prevention, Control, and Countermeasures Plan (SPCC Plan), a final Blasting Plan, an Oregon DEQ-approved Erosion

⁹⁰ On this point, ASC Exhibit I states:

IPC will obtain an NPDES 1200-C Stormwater Construction Permit, and will implement an ESCP. IPC proposes a generic set of construction BMPs to be available for use on a majority of the Project where soils are not highly erosive, slopes are not steep, and construction is away from surface water. More specific BMP methods and BMP locations will be designated in areas with higher potential for soil erosion impacts. Where steep slopes cannot be avoided, site-specific BMPs tailored to encountered soil types in those areas will be applied to control and reduce erosion. The ESCP will present appropriate BMPs for minimizing impacts in areas with steep slopes. No construction will occur until the 1200-C stormwater permit has been obtained and the ESCP has been finalized and approved by ODEQ.

(ODOE - B2HAPPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 29 of 115.)

⁹¹ The Reclamation and Revegetation Plan was developed primarily to address potential impacts to fish and wildlife habitat, as opposed to rehabilitation of disturbed soils. However, it provides the framework for reclamation of areas impacted by project construction, operation, and maintenance. It also sets out the requirements for implementing and monitoring reclamation of disturbed vegetation and meeting the reclamation success standards. (Madison Rebuttal Test. at 28-29.)

and Sediment Control Plan (ESCP), a Reclamation and Revegetation Plan, and a Vegetation Management Plan. (*Id.*)

255. In ASC Exhibit I, Idaho Power also included Table I-12, identifying the information responsive to the requirements of OAR 345-021-0010(1)(i), OAR 345-022-0022, and Second Amended Project Order and its location within the ASC. (ODOE - B2HAPPDoc3-16 ASC 09a_ Exhibit I_Soil_ASC_Part 1 2018-09-28, page 39-40 of 115.)

256. In the Proposed Order, the Department included Recommended Soil Protection Condition 1 requiring that, prior to construction, Idaho Power submit to the Department a final copy of its NPDES 1200-C permit, including the final ESCP, and that the Company conduct all work in compliance with the NPDES 1200-C permit and ESCP.⁹² The Department also included Recommended Soil Protection Condition 2 requiring submission of a final SPCC Plan and compliance with that Plan during construction of the facility. In the event Idaho Power takes over operation of the Longhorn Station, the Department included Recommended Soil Protection Condition 3, requiring a DEQ-approved SPCC Plan for operation. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 104-06 of 10016.) In addition, the Department included recommended conditions requiring Idaho Power to finalize and submit for Department approval a final Blasting Plan and requiring the Company to monitor and inspect facility components for soil impacts. (*Id.* at pages 108-09 of 10016.) The Department further noted that Recommended Fish and Wildlife Habitation Condition 2 requires the certificate holder to submit to the Department for approval a final Vegetation Management Plan monitoring and to conduct all work in compliance with that plan. (*Id.*)

257. Based on its findings and conclusions in the Proposed Order, and subject to compliance with the recommended site certificate conditions, the Department recommended that the Council find the proposed facility in compliance with the Soil Protection standard. ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 109-10 of 10016.)

258. In ASC Exhibit I, Idaho Power presented the soils information at the order level by county for the entire site boundary on Table I-2-1. (ODOE-B2HAPPDoc3-17 ASC 09b_ Exhibit I_Soil_ASC_Part 2 2018-09-28, pages 70-72 of 88.) In response to requests from limited parties, Idaho Power prepared an updated Table I-2-1 presenting soils information by county with the soil order, soil ID, soil name, acreage, percent and acreage of disturbance area, and soil properties. (Madison Rebuttal Test. at 52-53; Madison Rebuttal Ex. D; Madison Cross-Exam. Test., Tr. Day 2 at 49-52.)

⁹² The Department noted that the draft ESCP requires salvaging and segregating topsoil to reduce impacts to farmland and forested areas. The Department explained that Idaho Power's Agricultural Lands Assessment (ASC Exhibit K, Attachment K-1) details how the Company would mitigate impacts to productive soils and the agricultural and forest operations that require or depend on those soils. The Department added that Recommended Land Use Condition 14 requires the Company to finalize and submit to the Department for approval an Agricultural Lands Assessment, and to conduct all work in accordance with that assessment. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 107 of 10016.)

Findings related to compliance with the Structural Standard

259. The Structural Standard requires that the Council evaluate whether the applicant has adequately characterized the seismic hazard risk of the site, the geological and soil hazards of the site, and whether the applicant can design, engineer, and construct the proposed facility to avoid dangers to human safety and the environment from these hazards. OAR 345-022-0020.

260. In the Second Amended Project Order, the Department acknowledged that for this proposed facility, it would not be practical for Idaho Power to obtain detailed site-specific geotechnical investigation for the entire site boundary in advance of completing the final facility design and obtaining full site access. Nevertheless, the Department required that, as part of ASC Exhibit H (Geologic Hazards and Soil Stability) Idaho Power provide evidence that it consulted with the Oregon Department of Geology and Mineral Industries (DOGAMI) regarding the level of geologic and geotechnical investigation determined to be practical for the application submittal. The Department also required that geotechnical reports included in Exhibit H meet Oregon State Board of Geologist Examiners guidelines, as determined based on Idaho Power's consultation with DOGAMI. (ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 14 of 29.)

261. In ASC Exhibit H, Idaho Power provided information regarding the geological and soil stability within the site boundary for the project. Idaho Power described the analysis area, the methods to be used to generate the detailed information required by Council's standards, the geological and soil stability studies conducted to date, and a summary of its consultation with DOGAMI. Idaho Power also described the site-specific geotechnical work to be performed before construction, to be included in the site certificate as conditions; the approximate locations of geotechnical work; an assessment of seismic hazards; an assessment of geology and soil related hazards (including landslides, flooding, and erosion); and measures to be taken to avoid or mitigate dangers to human safety and the environment resulting from geologic hazards. (ODOE - B2HAPPDoc3-14 ASC 08a_ Exhibit H_Geology_ASC_Part 1 2018-09-28, pages 7-35 of 243.)

262. Idaho Power's geotechnical and environmental consultant identified and assessed landslide hazard areas within the site boundary. The consulting firm reviewed historically recorded landslides from the SLIDO database and identified other unstable land conditions from geologic maps and aerial imagery. The consultant then supplemented the landside hazard area inventory by a limited reconnaissance-level survey, evaluating current land stability factors such as soil composition, slope, and revegetation. (Sorensen Rebuttal test. at 13-14; *see also* ODOE - B2HAPPDoc3-14 ASC 08a_ Exhibit H_Geology_ASC_Part 1 2018-09-28, page 8 of 243).

263. Prior to construction, once Idaho Power obtains access and permission to proposed field investigation sites, Idaho Power will commence the second phase of its geotechnical exploration related to slope stability and landslides. Idaho Power's consultant will conduct geotechnical exploration to investigate subsurface soil and geologic conditions with an emphasis on areas identified as potential geologic hazards in ASC Exhibit H, Attachment H-1, the Engineering Geology and Seismic Hazards Supplement. (Sorensen Rebuttal test. at 19-20; ODOE - B2HAPPDoc3-14 ASC 08a_ Exhibit H_Geology_ASC_Part 1 2018-09-28, page 41 of

243.)

264. Using the results of the geotechnical investigation, Idaho Power will prepare a final engineering geologic report, the Phase 2 Site-Specific Geotechnical Report, prior to final design and construction to assess site-specific hazards in conformance with DOGAMI's guidance and the Oregon State Board of Geologist Examiners' 2014 Guidelines for Preparing Engineering Geological Reports. (Sorensen Rebuttal Test. at 23; ODOE - B2HAPPDoc3-14 ASC 08a_Exhibit H_Geology_ASC_Part 1 2018-09-28, page 9 of 243.) In its Phase 2 Site-Specific Geotechnical Report, Idaho Power will include the requisite site-specific information for sites that will be impacted by construction and operation of the project. Idaho Power will attempt to locate structures, such as transmission tower foundations, to avoid potential slope instability hazards wherever possible. Idaho Power will locate structures with sufficient setback from slopes to mitigate for potential slope instability during construction and operation. Where appropriate and necessary, Idaho Power will employ appropriate slope instability mitigation techniques, including modification of slope geometry, hydrogeological mitigation, slope reinforcement methods, or revegetation. (Sorensen Rebuttal Test. at 24-25.)

265. Performing additional site-specific surveys prior to obtaining a site certificate is neither practical, because Idaho Power is unable to obtain right of entry for multiple sites, nor necessary for compliance with the Council's Structural Standard. Idaho Power has performed, to the extent practicable, a thorough analysis of landslide potential and slope stability in the project analysis area. (Sorensen Rebuttal Test. at 32.)

266. In its Phase 2 Site-Specific Geotechnical Report, to be completed after issuance of the site certificate and prior to construction, Idaho Power will include the requisite site-specific information for sites that will be impacted by construction and operation of the project. Further, where appropriate and necessary, Idaho Power will employ appropriate slope instability mitigation techniques. (Sorensen Rebuttal Test at 32.)

267. Although blasting is not specifically addressed in any Council standard, the Structural Standard addresses impacts that could potentially result from blasting activities, such as slope instability, landslides, and flooding. Because construction of the proposed facility may involve blasting, Idaho Power included, as part of ASC Exhibit G, Attachment G-5, a draft Framework Blasting Plan. As stated in the introduction of the Framework Blasting Plan:

The [Plan] outlines methods to mitigate risks and potential impacts associated with blasting procedures that may be required for construction of the [project]. Also included in this section is a preliminary outline for the Blasting Plan to be prepared by the Construction Contractor(s) and submitted to Idaho Power Company (IPC) if blasting is required. The Compliance Inspection Contractor (CIC) and the appropriate agencies will be notified in advance of any required blasting so the area can be cleared. If blasting is to occur on federal lands, IPC will submit the Blasting Plan to the federal land-management agencies for final review and approval.

* * * * *

The complete Blasting Plan will be developed by the Construction Contractor(s) in consultation with IPC as detailed engineering design of the Project is completed and will contain the detailed information necessary for site-specific guidance. This plan framework provides Project-specific guidance for development of the complete Blasting Plan by identifying treatments and measures required to avoid, minimize, and mitigate Project-related impacts; prevent unnecessary degradation of the environment; ensure blasting activities comply with federal, state, or other agency requirements; and meet any stipulations of the Site Certificate. The Construction Contractor(s) will be responsible for preparing and implementing the complete Blasting Plan.

(ODOE - B2HAPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, page 96 of 102.)

268. The Framework Blasting Plan includes design features for the project to be applied project-wide for environmental protection and to address concerns related to blasting. As pertinent here, Design Feature 32 states as follows:

Design Feature 32. Watering facilities (tanks, natural springs and/or developed springs, water lines, wells, etc.) will be repaired or replaced if they are damaged or destroyed by construction and/or maintenance activities to their predisturbed condition as required by the landowner or land-management agency. Should construction and/or maintenance activities prevent use of a watering facility while livestock are grazing in that area, then the Applicant will provide alternate sources of water and/or alternate sources of forage where water is available.

(ODOE - B2HAPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, page 102 of 102.)

269. Idaho Power submitted the Framework Blasting Plan in draft form in the ASC because the company did not have access to all land on which the transmission line is routed and therefore cannot determine with certainty precisely whether or where blasting will be required. Also, Idaho Power plans to make the final decisions regarding blasting locations in consultation with its Engineering, Procurement, and Construction contractor after the project design has been finalized, and the project design cannot be finalized until after the Council approves the site certificate. (Cummings Rebuttal Test. at 20.)

270. In the Proposed Order, the Department noted that, consistent with the Structural Standard, Idaho Power developed the draft Framework Blasting Plan “to ensure that the proposed facility design and construction avoids dangers to human safety and environment from risks such as subsidence, landslides, and slope instability which could be impacted by blasting activities.” (ODOE- B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 89 of 10016.) The Proposed Order discussed the plan’s safety procedures and notification process. The Department, based on consultation with DOGAMI and other agencies, recommended adding several requirements to the Risk Management section (Section 8) of the draft plan. The Department recommended, among other things, that the plan include the requirement to implement a seismic monitoring plan or application of scaled distance factors to

monitor and ensure ground vibration at the nearest structured do not exceed NFPA established limits during blasting activities. (*Id* at pages 90-91 of 10016.)

271. In addition, the Department recommended the Framework Blasting Plan include requirements for preparing and submitting post-monitoring and seismic report(s) and that the contractor demonstrate adequate insurance coverage for a minimum of \$1,000,000. The Department also recommended that the plan include an established agency review process applicable to finalization of the draft plan and any future plan amendments. The review process will allow adequate opportunities for appropriate state and local agencies, with subject matter expertise, to review, coordinate and ensure the plan complies with applicable requirements and minimizes environmental and health and safety risks during facility construction. (ODOE-B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 90-92 of 10016.)

272. The Department also recommended several conditions related to the Structural Standard, including measures to design the proposed facility to avoid seismic and non-seismic hazards. Recommended Structural Standard Condition 1, requires that prior to construction of a phase or segment of the facility, the certificate holder submit an investigation plan and a site-specific geological and geotechnical investigation report, prepared by an Oregon-licensed professional engineer or geologist, demonstrating that the facility site has been adequately characterized and that the facility and temporary construction activities, such as blasting, have been designed and located to avoid seismic, soil, and geologic standards. (ODOE-B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 88 of 10016.)

273. Recommended Structural Standard Condition 1 also sets out the minimum information required in the pre-construction investigation report, including specific methods for evaluating potential slope instability and landslide hazards, as follows:

Potential slope instability and landslide hazards based on boring locations spaced approximately 1 mile along the alignment: at dead-end structures; any corners or changes in alignment heading (angles); crossings of highways, major roads, rivers, railroads, and utilities as power transmission lines, natural gas pipelines, and canals; *locations where blasting may occur*; and, *locations necessary to verify lithologic changes and/or geologic hazards such as landslides, steep slopes, or soft soil area.*

(ODOE - B2HAPPDoc2-1 Proposed Order on ASC w Hyperlink Attachments 2019-07-02, page 89 of 10016; emphasis added.)

274. With regard to flooding risks from construction and operation of the proposed facility, the Proposed Order states as follows:

The applicant represents that it would set facility structures and towers back from areas of high flood risks during final design; or, where structures cannot be set back, the applicant would conduct a site-specific structural and erosion hazard assessment and would coordinate with local flood zone managers to determine mitigation requirements. Recommended Structural Standard Condition 1 would

require the pre-construction site-specific geological and geotechnical investigation report to, in part, identify facility components within the 100-year flood zone, any related potential risk to the facility, and measures to mitigate the identified hazards.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 94 of 10016.) The Department also found that the mitigation measures listed in ASC Exhibit H would reduce risks posed by flooding, soil erosion, landslides, and mass wasting events. (*Id.* at 99 of 10016.)

275. To address landowner concerns regarding construction-related blasting, Idaho Power agreed to incorporate the requirement of Design Feature 32 into a site condition, as part of Recommended Soil Protection Condition 4:

b. Prior to construction, the certificate holder will consult with landowners regarding right-of-way acquisition, and during these consultations, the certificate holder will discuss with the landowner any blasting that the certificate holder plans to conduct on the landowner's property. If the landowner identifies a natural spring or well on the property, the certificate holder will notify the landowner that at the landowner's request, the certificate holder shall conduct pre-blasting baseline flow and water quality measurements for turbidity. The certificate holder shall compensate the landowner for adequate repair or replacement if damages to the flow or quality of the natural spring or well occur solely as a result of blasting.

(Cummings Rebuttal Test. at 44-45.)

276. Given the size of the blasts required to place transmission tower foundations, the geotechnical testing, the site-specific reconnaissance that Idaho Power will undertake prior to blasting, and the safety measures required by the Draft Framework Blasting Plan, it is highly unlikely that private wells would be impacted by blasting conducted for the project. (Cummings Rebuttal Test. at 43-44.)

277. Any blasting required to place tower foundations for the project will not be of the size or strength that would likely cause damage to nearby structures or features, or exacerbate flooding risks. Blasting configurations for tower foundations, by their nature, involve relatively small diameter blast holes, small charge weights, shallow blast hole depths, and short durations of excitation. Such practices do not produce seismic excitation or ground displacement that approaches such a level of off-site severity that could damage structures or exacerbate flooding risks to nearby properties. Furthermore, where the blasting contractor is required to address potential blasting impacts, the blasting contractor can employ additional measures to mitigate these potential impacts in accordance with recommended site conditions and the Framework Blasting Plan guidelines. (Cummings Rebuttal test. at 13.)

278. Idaho Power will consult with landowners regarding any blasting that Idaho Power plans to conduct on the landowner's property. At the landowner's request, Idaho Power will conduct pre-blasting baseline flow and water-quality measurements, testing specifically for

turbidity. Because the blast holes are highly unlikely to intercept ground water that can migrate to wells or springs, it is not necessary to test well water for contaminants other than turbidity. (Cummings Rebuttal Test. at 44.)

279. Limited parties Horst and Cavinato also raised concerns under the Structural Standard that vibrations caused by passing construction vehicles may cause damage to a well located on their property, close to the unpaved portion of Hawthorne Drive. (Horst Direct Test. at 6.) As found above, there is a deep water well on Mr. Horst's property, located approximately 10 feet from the gravel road. (*Id.*; Horst Ex. H.) About half of the well depth has steel casing, the remainder is drilled through hard rock. Mr. Horst also raised concerns that the well could be damaged from blasting activities on or near his property. (Horst Direct Test. at 6)

280. Robert Cummings is a geological engineer with expertise in rock blasting, geotechnical and mineral exploration and applied mining and engineering geology. In Mr. Cummings' opinion, the limited parties' concerns are unfounded and there is no need to perform preconstruction well water testing based on increased construction traffic on Hawthorne Drive. The seismic vibrations from passing construction vehicles will be minimal, and the limited traffic will not result in a cumulative fatigue effect or cause permanent damage to the well. There is also no need for Idaho Power to build new roads to direct construction-related traffic away from the deep well on the Horst-Cavinato property. Idaho Power's proposed mitigation measures, including reduced vehicle speeds, will address the limited parties' concerns about the well. (Cummings Rebuttal test. at 3, 46).

281. Limited party Jonathan White lives on Modelaire Drive in La Grande. His home is about 500 feet from the project site boundary at Hawthorne Dr. Mr. White raised concerns that construction-related blasting may cause damage to his home, property, and neighborhood streets. (White test.)

Findings related to hazardous materials management and monitoring

282. As part of Exhibit G, the ASC must include a materials analysis with: (a) an inventory of the industrial materials flowing into and out of the proposed facility during construction and operation; (b) the applicant's plans to manage hazardous substances⁹³ during construction and operation, including measures to prevent and contain spills; and (c) the applicant's plans to manage non-hazardous waste materials during construction and operation. (OAR 345-021-0010(1)(g).)

⁹³ The Oregon DEQ defines the term "hazardous substance" in OAR 340-122-0115(30) as follows:

- (a) Hazardous waste as defined in ORS 466.005;
- (b) Any substance defined as a hazardous substance pursuant to section 101(14) of the federal Comprehensive Environmental Response, Compensation and Liability Act, P.L. 96-510, as amended, and P.L. 99-499;
- (c) Oil as defined in ORS 465.200(18); and
- (d) Methane generated at a historic solid waste landfill; and
- (e) Any substance designated by the commission under ORS 465.400.

283. In addition, as part of Exhibit W, the ASC must include information about site restoration. For facilities that might produce site contamination by hazardous materials,⁹⁴ the ASC must include a proposed monitoring plan or an explanation why a monitoring plan is unnecessary. (OAR 345-021-0010(1)(w)(E).)

284. In ASC Exhibit G, as required by OAR 345-021-0010(1)(g), Idaho Power described the hazardous and non-hazardous material to be used as part of the proposed project and the plan for managing these materials. In ASC Exhibit G, Section 3.3, Idaho Power described its plan to manage hazardous substances during construction and operation, including measures to prevent and contain spills:

Hazardous materials will be segregated when stored within the multi-use areas. Hazardous materials will be stored in approved containers and clearly labeled. The construction contractor will maintain an inventory of all hazardous materials used and corresponding material safety data sheets (MSDS). The construction contractor will maintain copies of the required MSDSs for each hazardous chemical, and will ensure they are readily accessible during each work shift, to all employees when they are in their work areas. MSDSs will also be kept in service and refueling vehicles. The MSDSs will provide basic emergency response information for small and large releases of each hazardous material. If bulk hazardous materials are used, the Emergency Response Guidebook, produced by the United States Department of Transportation, also will be used to prepare for emergencies.

(ODOE - B2HAPPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, page 14 of 102.)

⁹⁴ The Oregon DEQ defines “hazardous materials” differently than “hazardous substance.” Pursuant to OAR 340-142-0005(9):

“Hazardous material” means one of the following:

- (a) Hazardous waste as defined in ORS 466.005.
- (b) Radioactive waste as defined in ORS 469.300, radioactive material identified by the Energy Facility Siting Council under 469.605 and radioactive substances as defined in 453.005.
- (c) Communicable disease agents as regulated by the Health Division under ORS 431 and 433.010 to 433.045 and 433.106 to 433.990.
- (d) Hazardous substances designated by the United States Environmental Protection Agency under section 311 of the Federal Water Pollution Control Act, P.L. 92-500, as amended.
- (e) Substances listed by the United States Environmental Protection Agency in 40 Code of Federal Regulations Part 302 — Table 302.4 (List of Hazardous Substances and Reportable Quantities) and amendments.
- (f) Material regulated as a Chemical Agent under ORS 465.550.
- (g) Material used as a weapon of mass destruction, or biological weapon.
- (h) Pesticide residue.
- (i) Dry cleaning solvent as defined by ORS 465.200(9).

285. As Attachment G-4 to ASC Exhibit G, Idaho Power included its Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) to be implemented during construction of the project. The SPCC Plan outlines the preventive measures and practices that contractors will employ to reduce the likelihood of an accidental release of a hazardous or regulated liquid and, in the event of such a spill, to expedite the response and remediation. (ODOE - B2HAPPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, page 66 of 102.)

286. Section 2 of the SPCC Plan addresses spill prevention practices. Spill prevention practices include: avoiding environmentally sensitive areas when selecting sites for project staging; requiring each contractor to develop a detailed, site-specific Hazardous Materials Management Plan prior to construction; and requiring each contractor to store, handle, and transfer fluids used during construction in a careful manner to prevent spills of hazardous materials. The SPCC Plan also requires that the dispensing and transfer of hazardous materials and wastes occur in accordance with national standards, including bonding or grounding during transfer of flammable liquids. (ODOE - B2HAPPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, pages 68-72 of 102.)

287. Section 3 of the SPCC Plan addresses emergency preparedness and requires that each contractor develop an emergency response plan for environmental emergency preparedness and response, appropriate for the hazardous materials and wastes used and generated. Section 4 of the SPCC Plan addresses incident or emergency response and includes a process requiring immediate notification in the event of a release of one pound or more of any hazardous material or any amount of hazardous waste. (ODOE - B2HAPPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, pages 72-76 of 102.)

288. In ASC Exhibit W, as required by OAR 345-021-0010(1)(w)(E), Idaho Power addressed site restoration in the event of retirement of the project. Idaho Power explained that because high-voltage transmission lines are designed and maintained to remain in service in perpetuity, it is highly unlikely that the project would ever be retired. Nevertheless, in ASC Exhibit W Idaho Power described the actions that would be necessary to restore the project site in the unlikely event the project is retired. In Section 3.5 of ASC Exhibit W, Idaho Power explained that when operating, the project is not likely to produce site contamination by hazardous materials. Therefore, a monitoring plan for hazardous materials is unnecessary:

The Project is not likely to cause site contamination by hazardous materials because the hazardous materials to be employed during Project construction and operation are limited to oils in transformers at the station, propane tanks at communication sites, and small quantities of lubricants, vehicle fuels, and herbicides used during Project construction and maintenance. A Spill Prevention, Control, and Countermeasures Plan will be developed by the Engineering, Procurement, and Construction contractor and submitted to ODOE prior to commencing construction of the Project. The Spill Prevention, Control, and Countermeasures Plan is developed to prevent and address any leakage or spills of these materials that may occur during construction and operations of the Project. Additionally, IPC will fully comply with Oregon Department of Environmental

Quality requirements for storage of hazardous materials and cleanup and disposal of hazardous waste on all lands associated with the Project. Given the limited quantities of hazardous materials that will be used for the Project, site contamination is highly unlikely and therefore a monitoring plan is unnecessary.

(ODOE - B2HAPDoc3-40 ASC 23_Exhibit W_Retirement_ASC 2018-09-28. page 11 of 28.)

289. In the Proposed Order, the Department discussed Idaho Power's draft SPCC Plan in connection with compliance with the Soil Protection standard. The Department noted that, during construction of the project, Idaho Power will require construction contractors to abide by the SPCC Plan. The Proposed Order set out pertinent provisions of the Draft SPCC Plan and recommended conditions relating to the SPCC Plan:

Recommended Soil Protection Condition 2: The certificate holder shall:

a. Prior to construction of the facility, submit to the Department a final copy of a Construction Spill Prevention Control and Countermeasures Plan (SPCC Plan). The protective measures described in the draft Construction SPCC Plan, as provided in Attachment G-4 of the Final Order on the ASC, shall be included in the final SPCC Plan, unless otherwise approved by the Department.

b. During construction of the facility, the certificate holder shall conduct all work in compliance with the final SPCC Plan.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 106 of 10016.)

290. The Proposed Order further found that Idaho Power did not anticipate needing an SPCC Plan during operations unless it were to operate the Longhorn Station instead of BPA. However, if that were to happen, the Department recommended another Soil Protection Condition related to implementing an SPCC Plan during operation of the Longhorn Station, if necessary.

Recommended Soil Protection Condition 3: Prior to operation, if the certificate holder is required by DEQ statutes or rules to implement a SPCC Plan for operation of the facility, the certificate holder shall submit to the Department a copy of a DEQ-approved operation-related SPCC Plan. The certificate holder shall maintain compliance with the operation-related SPCC Plan during operations at the Longhorn Station.

(ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 106-07 of 10016.)

291. In the Proposed Order, with regard to measures to contain chemical spills, the Department found as follows:

Based upon applicant representations, and compliance with the recommended conditions, any spills are expected to be limited and contained, and would be unlikely to leave the site boundary.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 107 of 10016.) The Department further recommended that the Council find the proposed facility in compliance with the Soil Protection standard, subject to Idaho Power's compliance with the recommended site certificate conditions. (*Id.* at pages 109-110.)

292. With regard to the Retirement and Financial Assurance Standard and the requirement to restore the site to a useful, non-hazardous condition at the end of the facility's useful life, the Proposed Order acknowledged Idaho Power's intent to design and maintain the transmission line to remain in service in perpetuity. The Department agreed that 100-year lifetime is a reasonable estimated useful life for the facility. In the Proposed Order, the Department recommended Retirement and Financial Assurance Conditions to ensure adequate restoration of the site to a useful, non-hazardous condition following permanent cessation of construction or operation of the proposed facility. (ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 299-302 of 10016.)

293. The Department did not require Idaho Power to implement a long-term hazardous materials monitoring plan because no hazardous materials will be used or stored on site during operation of the facility. With regard to facility retirement and site restoration, the Department found, in pertinent part, as follows:

The mandatory condition at OAR 345-025-0006(7), which the Department recommends the Council adopt as Retirement and Financial Assurance Condition 1, requires the certificate holder to prevent the development of any conditions on the site that would preclude restoration of the site to a useful, non-hazardous condition to the extent that prevention of such site conditions is within the control of the certificate holder. Hazardous materials that would be used during facility construction and operation would be limited to oils in the shunt reactors at Longhorn station, propane tanks at communication sites, and small quantities of lubricants, vehicle fuels, and herbicides used during facility construction and maintenance. None of the oils in the reactors at the Longhorn Station would contain polychlorinated iphenyls (PCB). Recommended Soil Protection Condition 2 would require the applicant and its contractors to follow a Spill Prevention, Control, and Countermeasures Plan or similar type of spill prevention and management plan to minimize and address and leakage or spills of these materials during facility construction and operation.

In Section IV.B., Organizational Expertise of this order, the Department recommends that the Council find that the applicant has the organizational expertise to construct, operate, and retire the proposed facility in compliance with that Council standard. In addition, the Department recommends that the Council find that the applicant meets the Council's Soil Protection, Fish and Wildlife Habitat, and Waste Minimization standards (Sections IV.D., IV.H., and IV.N. of

this order, respectively). Each of those sections imposes conditions on the applicant that are designed so that the construction and operation of the proposed facility would minimize adverse impacts on the surrounding land.

Based upon the evidence in the record, the Department recommends that the Council find that the applicant has the ability to restore the site to a useful, non-hazardous condition following permanent cessation of construction or operation of the proposed facility, subject to compliance with the recommended conditions listed above.

(ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 302 of 10016.)

294. Petroleum-based products are considered hazardous substances, but not hazardous materials. (Stippel Rebuttal Testimony, Issue M-6, at 10.) Idaho Power will not be using or storing any hazardous materials, as defined by Oregon DEQ, during construction or operation of the proposed facility, except blasting agents and explosives, which will only be used during construction. (*Id.* at 7; ODOE - B2HAPPDoc3-13 ASC 07_ Exhibit G_Materials_ASC 2018-09-28, pages 15-18 of 102.)

295. During operations, Idaho Power will be using gasoline, diesel fuel, motor oil, antifreeze and transmission fluid inside vehicles that come and go from the project site, but it will not be storing these materials on site. In addition, Idaho Power will be using herbicide for on-site weed control, but herbicides are not a recognized or regulated hazardous material for purposes of the DEQ rules. Furthermore, herbicide will not be stored on site during operations. It will be delivered to the site when needed and hand applied under manufacturer directions. (Stippel Rebuttal Test. Issue M-6, at 9; ODOE - B2HAPPDoc3-13 ASC 07_ Exhibit G_Materials_ASC 2018-09-28, page 15 of 102.)

CONCLUSIONS OF LAW

Fish and Wildlife Habitat Standard

Issue FW-3: The draft Noxious Weed Plan complies with the Council's standards. Idaho Power is not required to demonstrate compliance with the Weed Control Laws to satisfy the Fish and Wildlife Habitat Standard. The Council is not the agency responsible for enforcing compliance with the Weed Control Laws.

Issue FW-5: The Fish and Wildlife Habitat standard does not require or establish setbacks. Ms. Gilbert has not established that Idaho Power must mitigate impacts to riparian areas from the setback location to the outer edges of the riparian area or that all riparian habitat areas should be ODFW Habitat Category 2 at a minimum.

Issue FW-6: The updated draft Noxious Weed Plan is adequate to serve its

intended purpose of establishing the measures the Company will take to control noxious weed species and prevent the introduction of these species during construction and operation of the project. Ms. Geer has not presented evidence or persuasive argument to show that the Noxious Weed Plan is invalid or that Idaho Power will be unable to implement and adhere to the plan when finalized.

Issue FW-7: Idaho Power's Fish Passage Plan complies with the Fish and Wildlife Habitat standard's Category 2 mitigation requirements. Idaho Power is not required to revisit its fish passage plans because threatened Steelhead redds (Snake River Basin Steelhead) have been identified in the upper Ladd Creek watershed.

Historic, Cultural and Archeological Resources Standard

Issue HCA-3: Recommended HCA Condition 2, requiring Idaho Power to submit a final EFSC HPMP for Department approval and to conduct all construction-related activities in compliance with the approved EFSC HPMP provides adequate mitigation for visual impacts to identified HCA resources. There is no requirement for Council to provide further public review and comment on the EFSC HPMP prior to finalization of the plan.

Issue HCA-4: National Historical Oregon Trail segments with ruts located on Mr. Horst's property can be adequately protected from adverse impacts from proposed facility based on HCA site certificate conditions. Any direct impacts would be avoided and indirect impacts would be minimized and mitigated.

Issue HCA-6: Limited party Webster has not established that, as part of Recommended HCA Condition 2, Idaho Power is required to have Oregon Trail expert added to the Cultural Resource Team and present during preconstruction surveys to identify emigrant trail locations.

Issue HCA-7: For purposes of Council review under the HCA standard, Idaho Power adequately evaluated historic and archaeological resource identified as "Site 6B2H-MC-10" on Mr. Williams' property, Parcel 03S37E01300.

Land Use Standard

Issue LU-4: The Fosses have not established that operation of the proposed transmission line would interfere with GPS-navigated irrigation systems.

Issue LU-7: In evaluating the proposed facility impacts to the cost of forest practices, Idaho Power accurately determined the total acres of lost production and indirect costs.

Issue LU-8: Idaho Power adequately evaluated the proposed facility's impacts on forest management practices. The proposed measures to mitigate impacts on

forested areas are adequate and appropriate.

Issue LU-9: Idaho Power adequately analyzed the risk of wildfires from operation of the proposed transmission lines, especially during “red flag” warning weather conditions and the impact the proposed transmission line may have on Mr. Myers’ ability to utilize aerial application on his farmland.

Issue LU-11: Idaho Power adequately evaluated the impacts from the proposed facility on accepted farm practices and the cost of accepted farm practices. The proposed measures to mitigate the facility’s impacts to surrounding farmlands are adequate and appropriate.

Noise Control Rules

Issue N-1: The Department lawfully modified the noise sensitive property owner identification requirement in ASC Exhibit X from one mile to one-half mile of the site boundary. OAR 345-021-0010(1)(x)(E) does not require notification to all owners of noise sensitive properties within one mile of the site boundary.

Issue N-2: The Department did not err in recommending that the Council grant a variance or exception from the Oregon DEQ’s Noise Rules. The Department’s recommendation is consistent with ORS 467.010.

Issue N-3: Idaho Power’s methodologies for evaluating compliance with OAR 340-035-0035 were appropriate. The Department did not err in approving the methodology.

Issue N-4: The proposed mitigation/Recommended Noise Control Conditions (as amended herein) adequately protect the public health, safety, and welfare.

Issue N-6: Idaho Power’s methodology for assessing baseline noise levels reflect reasonable baseline noise estimates for residents of the Morgan Lake area.

Public Services Standard

Issue PS-1: Ms. Badger-Jones has not established that Idaho Power was required to evaluate traffic safety impacts from construction-related use of Morgan Lake Road.

Issue PS-2: Further public review and comment on the Wildfire Mitigation Plan is unnecessary for purposes of approving the site certificate. Furthermore, there is no requirement under the Council’s rules that the Wildfire Mitigation Plan include specific fire protection or suppression tools, such as remote cameras, a shut off plan, and on-site firefighting equipment and personnel during construction.

Issue PS-3: The Council’s reliance on Public Services Condition 7 and the

OPUC-approved Wildfire Mitigation Plan is adequate to address wildfire response consistent with the Public Services standard.

Issue PS-4: Idaho Power adequately analyzed the risk of wildfire arising out of operation of the proposed facility and the ability of local firefighting service providers to respond to fires in the project area.

Issue PS-5: Ms. Gilbert presented no evidence or argument in support of this issue. A preponderance of the evidence establishes the sufficiency of the Wildfire Mitigation Plan as it relates to compliance with the Public Services standard.

Issue PS-6: Idaho Power has adequately evaluated the potential traffic impacts and modifications needed on the Hawthorne Loop, as well as the unpaved, private-access portion of Hawthorne Drive.

Issue PS-8: The Department's proposed revisions to Public Services Condition 7 are redundant with Attachment U-3 (the FPS Plan) and existing condition requirements.

Issue PS-9: A preponderance of the evidence supports Idaho Power's proposed revisions to draft FPS Plan and the Department's proposed revisions to Recommended Public Services Condition 6.

Issue PS-10: The draft FPS Plan (Attachment U-3) is adequate to establish compliance with the Public Services standard in terms of fire protection. The evidence also demonstrates that local service providers would be able to respond to a facility-related fire.

Recreation Standard

Issue R-1: Idaho Power adequately evaluated the potential adverse impact of the proposed facility on recreational opportunities at Morgan Lake Park.

Issue R-2: Idaho Power is not required to demonstrate compliance with the Morgan Lake Park Plan because there are no proposed project components located within the park boundary. Nevertheless, Idaho Power considered the objectives and values of the Morgan Lake Plan in determining that scenery is a valued attribute of Morgan Lake Park, and incorporated that determination in its analysis of potential project impacts to the park.

Issue R-3: The funds paid to the City of La Grande are not intended to mitigate for the proposed facility's visual impacts at Morgan Lake Park. Rather, the funds are intended for recreational improvements as mitigation for potential impacts to the park as a recreational resource. Recommended Recreation Condition 1 provides the mitigation for visual impacts.

Issue R-4: Idaho Power's supplemental analysis of Morgan Lake Park adequately evaluates the proposed project's visual impacts in the undeveloped areas of the park.

Retirement and Financial Assurance Standard

Issue RFA-1: The proposed \$1 bond amount for the first 50 years of operation, with a phased-in increase over the next 50 years of operation until the bond covers the full decommissioning cost, adequately protects the public from facility abandonment and provides a basis for the estimated useful life of the facility.

Issue RFA-2: In the event of retirement of the proposed transmission line, removal of concrete footings to a depth of one foot below the surface is sufficient to restore the site to a useful, nonhazardous condition.

Scenic Resources and Protected Areas Standards

Issue SR-2: Idaho Power satisfied the Scenic Resources and Protected Area standards at Flagstaff Hill/NHOTIC. Idaho Power was not required to analyze the feasibility of undergrounding the transmission line as mitigation for potential visual impacts.

Issue SR-3: Idaho Power accurately assessed the visual impact of the proposed project in the vicinity of the NHOTIC and properly determined that the impact would be less than significant as defined by Council rule.

Issue SR-7: The methodology Idaho Power used to determine the extent of adverse impact of the proposed facility on scenic resources, protected areas, and recreation along the Oregon Trail was reasonable and appropriate. Limited parties have not shown that the methodology was flawed, that Idaho Power erred in applying numeric values to the adverse impact, and/or that the Company used unsatisfactory measurement locations/observation points in its visual impact assessment.

Soil Protection Standard

Issue SP-1: Neither the Soil Protection Standard nor the General Standard of Review require Idaho Power to evaluate soil compaction, loss of soil structure and infiltration, loss of stored carbon in the soil, and/or the loss of soil productivity as a result of the release of stored carbon in soils to demonstrate compliance with the Council's standards. Idaho Power presented sufficient information for the Council to find that the proposed facility, taking into account mitigation, is not likely to result in a significant adverse impact to soils.

Structural Standard

Issue SS-1: Ms. Webster has not sustained her burden of producing evidence on this issue. Additionally, Idaho Power has proposed a modified version of Design Feature 32 be added to Recommended Soil Protection Condition 4.

Issue SS-2: Mr. Cooper has not shown that construction-related blasting is likely to increase the risk of flooding in areas adjacent to the proposed transmission line. Mr. Cooper also has not established the need to evaluate hydrology or to analyze all existing creeks and ditches that drain into streets and private property, or the need to take core soil samples prior to selection of the final route for Idaho Power to demonstrate compliance with the Structural Standard.

Issue SS-3: Limited parties Horst and Cavinato have not established the need to require Idaho Power to test water quality of private water wells before, during, and after construction of the proposed facility.

Issue SS-5: Idaho Power has provided sufficient evidence to evaluate compliance with the Structural Standard. There is no need for Idaho Power to conduct additional site-specific geotechnical surveys prior to issuance of the site certificate to comply with Structural Standard. Based on compliance with the pertinent conditions, Idaho Power has demonstrated the ability to evaluate and avoid potential geologic and soils hazards, and blasting-related impacts, in accordance with the standard's requirements.

Miscellaneous Issue

Issue M-6: Public review is not required for finalization of the SPCC Plan. The SPCC Plan is sufficient for purposes of compliance with the Soil Protection and Retirement and Financial Assurances standards. Because the proposed facility will not produce contamination from hazardous materials, no long-term monitoring for hazardous materials is necessary and Idaho Power was not required to propose such a monitoring plan in the ASC pursuant to OAR 345-021-0010(w).

OPINION

Fish and Wildlife Habitat Standard

As pertinent to the remaining issues in this matter, the Fish and Wildlife Habitat standard, OAR 345-022-0060 states:

To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are consistent with:

- (1) The general fish and wildlife habitat mitigation goals and standards of OAR

635-415-0025(1) through (6) in effect as of February 24, 2017[.]

Noxious weed control – Issues FW-3 and FW-6

Issue FW-3: Whether the Draft Noxious Weed Plan (Proposed Order Attachment P1-5) adequately ensures compliance with the weed control laws, ORS 569.390, ORS 569.400, and ORS 569.445.

Oregon's Weed Control law are set out in ORS Chapter 569. ORS 569.390, titled "Owner or occupant to eradicate weeds," states as follows:

Each person, firm or corporation owning or occupying land within the district shall destroy or prevent the seeding on such land of any noxious weed within the meaning of ORS 569.360 to 569.495 in accordance with the declaration of the county court and by the use of the best means at hand and within a time declared reasonable and set by the court, except that no weed declared noxious shall be permitted to produce seed.

ORS 569.400, addressing the refusal or failure to eradicate weeds, states in pertinent part:

(1) If the owner or occupant of the land fails or refuses to immediately destroy or cut the noxious weeds in accordance with ORS 569.360 to 569.495, the weed inspector shall at once notify the county court. The county court shall at once take necessary steps for enforcement of ORS 569.360 to 569.495. * * * .

And finally, ORS 569.445, addressing the duty to clean machinery before moving, states in pertinent part:

No person operating or having control of any threshing machinery, clover huller, hay baler, seed cleaning or treating machinery or other machinery shall move said machinery over any public road or from one farm to another without first thoroughly cleaning it. Before moving it, all hay or bundle racks and all other equipment shall be thoroughly swept and cleaned. * * * .

Limited parties Geer and Gilbert have standing on Issue FW-3. Both Ms. Geer and Ms. Gilbert contend that, in order to grant a site certificate, the Council must find that the applicant's weed control plan complies with ORS 569.390, 569.400, and 569.445. More specifically, they argue that the draft Noxious Weed Plan does not comply with Oregon's Weed Control laws for the following reasons: (1) it does not require Idaho Power to control all noxious weeds within the site boundary; (2) it does not apply to all state and county-listed noxious weeds; (3) it does not include provisions ensuring that no noxious weeds will go to seed; (4) it does not require sufficient monitoring and control for the life of the development; and (5) it does not sufficiently account for vehicle and equipment cleaning.⁹⁵ See Gilbert Opening Arguments Issue FW-3;

⁹⁵ In their arguments, Ms. Geer and Ms. Gilbert also raise contentions that fall outside the scope of Issue FW-3. Specifically, both limited parties challenge the procedure for finalizing the Noxious Weed Plan and assert that the public is entitled another opportunity to review and comment before the Plan is

Geer Direct Test.; Geer Direct Test.; Gilbert Closing Brief; Geer Closing Arguments on Issues FW-3 and FW-6; Geer Response to Closing Arguments Issues FW-3 and FW-6; Gilbert Response Brief Issue FW-3.

Contrary to the limited parties' contentions, Idaho Power is not required to demonstrate compliance with ORS Chapter 569 to satisfy the Council's siting standards generally or the Fish and Wildlife Habitat standard in particular.⁹⁶ This is because there is no specific requirement under ORS 469.510 or under OAR 346-021-0010 to address weed control in the ASC and the Department did not identify ORS Chapter 569 as applicable to the proposed facility in the Project Order.⁹⁷ Furthermore, the Council is not responsible for enforcing Oregon's Weed Control laws, as per ORS 569.400 that enforcement responsibility lies with the county courts. Therefore, contrary to Ms. Gilbert's argument, the Council is not waiving compliance with the Weed Control laws by finding that the proposed facility complies with the Fish and Wildlife Habitat standard.

Responsibility for pre-existing weed infestations. Both Ms. Gilbert and Ms. Geer argue that Idaho Power bears responsibility for weed control throughout the site boundary (and not just the ROWs) and that the Council must impose conditions to ensure that noxious weeds are not allowed to go to seed for the life of the development. However, the siting standards only require that Idaho Power address noxious weed infestations resulting from the project and that the Company prevent or mitigate those project-related adverse impacts. There is no Council rule that requires Idaho Power to demonstrate that it will eradicate preexisting noxious weeds that are not the result of ground disturbance associated with project construction. ORS Chapter 569 may impose additional obligations on Idaho Power as a landowner or occupant to control non-project-related noxious weed infestations, but as noted above, those obligations are independent from and not a requirement of demonstrating compliance with the Council's siting standards.

Treating all state and county-listed weeds. Ms. Geer argues that Idaho Power should treat all noxious weeds, regardless of their classification. Based on the provisions of the updated draft Noxious Weed Plan, Idaho Power commits to identifying, controlling, treating, and monitoring noxious weed species listed on Oregon's Weed Board Class A, B and T lists; as well as Baker, Malheur, Morrow, Umatilla, and Union county Class A and B lists.⁹⁸ Idaho Power also commits to consulting with county weed districts annually regarding appropriate treatment (if any) for Class C weeds and to annual review of state and county weed lists to ensure that any

finalized. Gilbert Opening Arguments Issue FW-3 at 6; Geer Surrebuttal Test. Although this contention falls outside the scope of Issue FW-3, the same challenge to the finalization of draft plans is addressed *infra* in connection with Issue M-6.

⁹⁶ Contrast with OAR 345-022-0060 specifically requiring consistency with ODFW's habitat mitigation goals and standards and the sage-grouse specific habitat mitigation requirements.

⁹⁷ OAR 345-015-0160 requires the Department to send a project order to the applicant establishing, among other things, "(a) All state statutes and administrative rules containing standards or criteria that must be met for the Council to issue a site certificate for the proposed facility, including applicable standards of divisions 22, 23 and 24 of this chapter."

⁹⁸ Taylor Rebuttal Exhibit B at 35.

changes in noxious weed classification will be identified and incorporated into the Plan.⁹⁹ The updated draft Noxious Weed Plan is consistent with the state Weed Control laws.

Frequency of monitoring/prohibiting weeds going to seed: Limited parties Geer and Gilbert argue that, in order to comply with the Weed Control laws, Idaho Power must monitor areas that may contain Category B noxious weeds twice annually and the Noxious Weed Plan only provides for annual monitoring for up to five years. The limited parties also argue that, pursuant to ORS 469.390, the Noxious Weed Plan must include provisions ensuring that no noxious weeds will go to seed. As discussed above, although ORS 569.390 requires landowners and occupiers to use the best means to prevent the seeding of any noxious weed, nothing in the weed control statutes specifically require twice annual monitoring of the land in issue. Second, and as previously discussed, any obligation to control noxious weeds imposed on a landowner or occupier by ORS Chapter 469 is independent of the showing an applicant must make to demonstrate compliance with the Council's siting standards in general, and the Fish and Wildlife Habitat standard in particular.

In addition, as set out in the updated draft Noxious Weed Plan, Idaho Power has committed to monitoring and controlling noxious weeds "at least once annually" during the first five-year period.¹⁰⁰ After the five-year initial assessment period, Idaho Power will prepare a location-specific long-term monitoring plan to ensure control or mitigation of all project-related noxious weed infestations.¹⁰¹ Finally, there is no need for the Noxious Weed Plan to include provisions ensuring that no noxious weeds will go to seed because the Council is not responsible for enforcing the provisions of ORS 569.390.

Vehicle and equipment cleaning/compliance with ORS 569.445. Finally, Ms. Gilbert argues that the Noxious Weed Plan must comply with ORS 569.445, and that for the life of the project, Idaho Power must thoroughly clean all vehicles and equipment prior to movement over any public roads or from one property to another. Gilbert Opening Argument at 6-7; Gilbert Closing Brief at 12-14. Ms. Gilbert contends that because ORS 569.445 requires thorough cleaning of "any threshing machinery, clover huller, hay baler, seed cleaning or treating machinery or other machinery," the statute extends to any vehicle or machinery that Idaho Power may use in constructing or operating the facility.

Both the Department and Idaho Power assert that the Company is not required to demonstrate compliance with ORS 569.445 in order for the Council to grant the site certificate. They further assert that Ms. Gilbert's reading of ORS 569.445 is overbroad, and the statute is limited to its application to agricultural machinery. The ALJ agrees with the Department and Idaho Power on both points.

First, as discussed above, because the Weed Control laws are not referenced in ORS 469.501 or the Project Order, Idaho Power is not required to demonstrate compliance with ORS

⁹⁹ *Id.* at 11-12.

¹⁰⁰ Taylor Rebuttal Exhibit B at 36 (updated draft Noxious Weed Plan, Section 6.1).

¹⁰¹ *Id.*

569.445 for purposes of the Council's siting standards and Council is not responsible for enforcing these laws. Second, even if Idaho Power was required to demonstrate compliance with the Weed Control laws, ORS 569.445 is not applicable in this context. Applying accepted principles of statutory construction, the ALJ finds that the phrase "or other machinery" in ORS 569.445 is limited to other machinery used for agricultural purposes and does not extend to passenger vehicles, construction vehicles, and/or construction equipment.

Under the interpretive rule of *ejusdem generis*, a nonspecific or general phrase that appears at the end of a list of items in a statute is to be read as referring only to other items of the same kind as the items in the list. *See, e.g., Vannatta v. Keisling*, 324 Or 514, 533 (1997). Consequently, the phrase "other machinery" in ORS 569.445 must be read in light of the types of machinery specified in the statute ("threshing machinery, clover huller, hay baler, seed cleaning or treating machinery"). All of these items share the same basic characteristic – machinery commonly used in farming. Simply stated, the text and context of ORS 569.445 does not support Ms. Gilbert's broad interpretation of the term "other machinery." The statute does not apply to Idaho Power's construction and operation of a high voltage transmission line.

In summary, the draft Noxious Weed Plan, as updated, complies with the Council's standards. Idaho Power is not required to demonstrate compliance with the Weed Control Laws to satisfy the Fish and Wildlife Habitat Standard. Because the Council is not the agency responsible for enforcing compliance with the Weed Control Laws, the Noxious Weed Plan need not include provisions ensuring that no weeds will go to seed for the life of the development.

*Proposed site certificate conditions related to Issue FW-3:*¹⁰²

Ms. Gilbert timely proposed site certificate conditions related to noxious weed control in her Opening Arguments;¹⁰³ Ms. Gilbert proposed additional conditions in her Closing Brief on Issue FW-3.¹⁰⁴ Ms. Gilbert's proposed conditions are addressed below. .

¹⁰² In its Rebuttal to Direct Testimony, Evidence and Response to Proposed Site Certificate Conditions, at pages 25-28, the Department proposed amending Recommended Fish and Wildlife Condition 3. However, in its Closing Brief, the Department withdrew the proposed revisions/amendments to Recommended Fish and Wildlife Condition 3 based on the revisions and clarifications in Idaho Power's updated draft Noxious Weed Plan (submitted as Taylor Rebuttal Exhibit B). ODOE Closing Brief at 16-20.

¹⁰³ The conditions that Ms. Gilbert proposed in her Opening Arguments on Issue FW-3 overlap in many respects with conditions she proposed in her Opening Arguments on Issue LU-11. To the extent Ms. Gilbert's proposed conditions for Issue LU-11 relate to noxious weed control, they are addressed in this section.

¹⁰⁴ *See* Gilbert Closing Brief on FW-3 at 33-34.

Gilbert Proposed Noxious Weed Condition 1: During construction, operation and site restoration, IPC will require any equipment leaving the site to travel on public roads or which will cross from one property owners land to another to be cleaned to assure there is no unintentional spread of noxious weeds.¹⁰⁶

Gilbert Proposed Noxious Weed Condition 2: No noxious weeds are allowed to develop seeds within the site development.¹⁰⁷

Gilbert Proposed Noxious Weed Condition 3: The developer will monitor and treat noxious weeds occurring within the site boundary annually for the life of the development unless a different schedule is approved by the ODFW and the Council.¹⁰⁸

Gilbert Proposed Noxious Weed Condition 4: Monitoring and treatment methodologies to be followed for the life of the project will be developed in coordination with the ODFW.¹⁰⁹

Gilbert Proposed Noxious Weed Condition 5: The developer will monitor and control all noxious weeds within their site boundary for the life of the project on a schedule approved by the ODFW and updated every five years.¹¹⁰

Both the Department and Idaho Power assert that the above-proposed conditions are inappropriate and/or unnecessary for purposes of establishing compliance with the Council's siting standards. The ALJ agrees, and for the reasons that follow, the ALJ denies Ms. Gilbert's proposed noxious weed conditions.

Gilbert Proposed Noxious Weed Condition 1 is unnecessary and inappropriate because, as discussed above, ORS 569.445 does not apply to Idaho Power's construction vehicles and equipment. Moreover, the vehicle washing protocols set out in the Noxious Weed Plan are sufficient to ensure that Idaho Power's construction vehicles and equipment will not introduce or spread noxious weeds.

Gilbert Proposed Noxious Weed Condition 2 is unnecessary and inappropriate because it

¹⁰⁶ Gilbert Opening Arguments Issue FW-3 at 7; Gilbert Opening Arguments Issue LU-11 at 16.

¹⁰⁷ Gilbert Opening Arguments Issue FW-3 at 15; Gilbert Opening Arguments Issue LU-11 at 16.

¹⁰⁸ Gilbert Opening Arguments Issue FW-3 at 15; Gilbert Opening Arguments Issue LU-11 at 16.

¹⁰⁹ Gilbert Opening Arguments Issue FW-3 at 8.

¹¹⁰ Gilbert Opening Arguments Issue FW-3 at 12.

extends beyond the Council's jurisdiction. Idaho Power's commitments and obligations regarding noxious weeds are set out in the Noxious Weed Plan. As set out therein, Idaho Power commits to controlling noxious weeds that are within project ROWs and that result from the Company's surface-disturbing activities during construction and operation. As previously stated, the Council is not tasked with enforcing ORS 569.390. Enforcement of the weed eradication laws lies with the county court. *See* ORS 569.400(1).

Gilbert Proposed Noxious Weed Conditions 3, 4 and 5 are also inappropriate and unnecessarily restrictive. The updated draft Noxious Weed Plan provides that if Idaho Power's control of noxious weeds is deemed unsuccessful after five years of monitoring and noxious weed control actions, then the Company will coordinate with ODOE regarding appropriate steps forward and will prepare a location-specific long-term monitoring plan based on the results of the initial five-year assessment period.¹¹¹ Insofar as Ms. Gilbert's proposed conditions grant ODFW sole authority to determine the methods and frequency of noxious weed monitoring and treatment, the proposals are inconsistent with the Council rules governing agency review final monitoring and mitigation plans.

Gilbert Proposed Noxious Weed Conditions

1. Future modifications, amendments or other changes to the Noxious Weed Plan must continue to include the following conditions.
2. The developer will monitor and control all existing and future noxious weeds at the site of the development for the life of the project. Monitoring and control of noxious weeds will occur a minimum of once a year, or more frequently to assure no noxious weeds are allowed to develop seeds. In the event that Category A weeds have been identified at the site, the monitoring and control will occur at least twice annually.
3. During the life of the development all machines and equipment must be cleaned prior to entering the site, leaving the site and entering public roads, moving machines and/or equipment from one property owner's land to another or from a location containing noxious weed species to one that does not contain the noxious weed species.
4. In the event that the developer fails to control noxious weeds and avoid their spread to adjoining areas, the increased costs, changes in procedures and damages related to their spread will be assessed and mitigation required.

For the same reasons proffered for Ms. Gilbert's Proposed Noxious Weed Conditions 3, 4 and 5, the above-proposed conditions are inappropriate and unnecessarily restrictive. First, including a condition that applies to the Noxious Weed Plan that precludes certain provisions from being amended or modified in the future ((1) above) is inconsistent with both statute and rule. ORS 469.402 provides Council broad discretion and authority to delegate future review and approval of site certificate requirements, such as an amendment to the Noxious Weed Plan, to the Department. Similarly, the Fish and Wildlife Habitat standard (OAR 345-022-0060) requires avoidance, minimization and mitigation of impacts to wildlife habitat through a demonstration of consistency with ODFW's Fish and Wildlife Habitat Mitigation Policy. The standard offers no prescriptive requirement that must be met to demonstrate such consistency. Therefore, it would be inconsistent to prohibit the Department and/or Council's review of components of the plan if, in the future, there is reason and basis to do so. The Department's action cannot be arbitrary and capricious. There is a built-in formal agency review process included in both the plan and condition that applies to any future change to the plan which

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ensure that such changes would be reviewed by subject matter/agency experts; establishing a limit on this type of future potential review is unnecessary.

Accordingly, the Council and ALJ reject each of Ms. Gilbert's proposed conditions related to noxious weed control.

Ms. Geer also timely proposed site certificate conditions related to Issue FW-3 (and FW-6), which are addressed below. In her Closing Arguments, Ms. Geer submitted additional revisions to her proposed conditions related to Issue FW-3.¹¹² These proposed conditions, as revised in her Closing Arguments as applicable, are addressed below.

Geer Proposed Noxious Weed Condition 1: The developer must implement a management and monitoring plan which assures that noxious weeds located on the site of the proposed transmission line are not allowed to produce seeds during the life of the project. The [Council] must determine that the plan meets the requirements of the statute, approve of the plan, and include it in the site certificate.¹¹³

Geer Proposed Noxious Weed Condition 2: Prior to the start of construction, Idaho Power will consult with Oregon Natural Areas program, land trusts, and local Parks departments to re-examine the proposed routes to avoid high quality natural areas and submit a revised Application for Site Certificate to the Energy Facility Siting Committee.¹¹⁴

¹¹¹ Taylor Rebuttal, Exhibit B at 36.

¹¹² In her Closing Arguments Ms. Geer restated her proposed conditions and proposed additional revisions/amendments to Recommended Fish and Wildlife Condition 3. Geer Closing Arguments at 20-23.

¹¹³ Geer Proposed Invasive Weeds Site Certificate Condition, September 17, 2021.

¹¹⁴ Geer Proposed Conditions on Issues FW-3 and FW-6 at 2.

Geer Proposed Noxious Weed Condition 3: Prior to the start of construction, Idaho Power will agree to control invasive weeds that are ecologically devastating to natural, scenic and recreational areas - not just those weeds on county and state noxious weeds lists, which are only those driven by being “economically important” (agriculture). Idaho Power would consult with local experts on each natural, scenic, and recreation area to get lists of ecologically damaging weeds to control.¹¹⁵

Geer Proposed Noxious Weed Condition 4: Request that Idaho Power assume weed control for the life of the B2H transmission line project.

Geer Proposed Noxious Weed Condition 5: Request that Idaho Power prepare a detailed Final Weed Plan which all concerned parties and any member of the public will review and provide input; this will become part of the Application for Site Certificate.

Site Certificate Conditions of Susan Geer on Issues FW-3 and FW-6 at 2.

Both the Department and Idaho Power oppose Ms. Geer’s proposed noxious weed conditions as inappropriate and/or not necessary to meet the requirements of ORS Chapter 569. The ALJ agrees.

Geer Proposed Noxious Weed Condition 1 is inappropriate because, as discussed above, the Council is not required to determine that the Noxious Weed Plan complies with the Weed Control laws. The Council’s authority to address noxious weeds is limited to assessing compliance with Council siting standards. Also, as discussed above, the Council is not responsible for enforcing ORS 569.390. That responsibility lies with the weed supervisors and county courts.

Geer Proposed Noxious Weed Condition 2 and 3 are inappropriate and/or unnecessary because they exceed the Council’s jurisdiction. As to Proposed Condition 2, the Council has no authority to direct Idaho Power to consult with other programs or agencies to re-examine the proposed routes. Also, as Idaho Power notes, the term “high quality natural areas” is vague and ambiguous, and the proposed condition is unnecessary because Idaho Power has provided sufficient evidence to establish that the project complies with the Protected Area Standard. Idaho Power also notes that the project will directly impact only one State Natural Area, the Ladd Marsh Wildlife Area, but the impacts are permissible under OAR 345-022-0040(3). As to Geer Proposed Noxious Weed Condition 3, the Council has no authority to require that Idaho Power address “ecologically devastating” weeds that are not listed on Weed Board and impacted counties’ lists of Class A and Class B noxious weeds.

Geer Proposed Noxious Weed Condition 4 is unnecessary because, as discussed above, weed control is adequately addressed in the updated draft Noxious Weed Plan.

¹¹⁵ *Id.*

Geer Proposed Noxious Weed Condition 5 is inappropriate because it is inconsistent with the Council's rule governing monitoring and mitigation plans. Idaho Power will finalize the Noxious Weed Plan in consultation with the Department and appropriate state and local agencies. As discussed in more detail later in this order,¹¹⁶ the Council's rules do not require further public review and comment on monitoring and mitigation plans prior to finalization and Council's approval of a site certificate. See ORS 469.402 (authorizing the Council to delegate the approval of a future action to the Department).

Geer Proposed Noxious Weed Condition

Request that Idaho Power not only collect detailed research-level data on noxious weeds and revegetation success as they outline in the Reclamation and Revegetation Plan under 6.0 RECLAMATION SUCCESS STANDARDS, MONITORING, AND MAINTENANCE, but enter that data electronically and share it in a user-friendly format with Oregon State agencies, affected landowners, and provide it upon request to any interested member of the public.

If available Idaho Power should also provide weed control and revegetation data for all other Projects. These types of data are hard to find for Energy development projects. The EFSC and concerned parties need to access and analyze these data for future decision making.

Geer's above referenced Proposed Noxious Weed Condition is inappropriate and/or unnecessary. First, use of the phrase "detailed-research-level data" is not explained; arguments have not been provided that support why the amount of data to be collected under the Noxious Weed Plan (recommended Fish and Wildlife Condition 3) and Reclamation and Revegetation Plan (recommended Fish and Wildlife Condition 1) do not constitute a reasonable level of biological data necessary to inform pre-disturbance conditions and establish appropriate success criteria. Second, the proposed terms of Ms. Geer's condition would exceed the Council's jurisdiction. The Council has no authority to require that Idaho Power collect detailed-research level data, assuming this to mean a level of data and analysis tantamount to an academic level research project, to evaluate and inform the success of noxious weed control and/or restoration. Similarly, the ASC under review represents the only facility proposed by Idaho Power that would be an EFSC-jurisdictional facility. Regardless, Council has no authority to require that the Noxious Weed Plan, Reclamation and Revegetation or associated site certificate conditions require an evaluation of data obtained from all other Idaho Power owned and operated facilities.

For the above-stated reasons, the Council and ALJ deny Ms. Geer's proposed conditions related to noxious weed control and natural areas.

Issue FW-6: Whether the Noxious Weed Plan provides adequate mitigation for potential loss of habitat due to noxious weeds when it appears to relieve Applicant of weed monitoring and control responsibilities after five years and allows for compensatory mitigation if weed control is unsuccessful.

Ms. Geer also has standing on Issue FW-6. On this issue, Ms. Geer asserts as follows: (1) in natural areas, Idaho Power should be required to prevent or eliminate all non-native invasive plant species and not just those listed as noxious; (2) the Noxious Weed Plan improperly relieves Idaho Power of monitoring and control responsibilities after five years at the expense of native habitat; (3) the Noxious Weed Plan does not provide adequate mitigation

for potential loss of habitat; and (4) the Noxious Weed Plan does not offer adequate compensatory mitigation if weed control is unsuccessful. Geer Closing Arguments Issue FW-6 at 15-17. For the reasons that follow, Ms. Geer's challenges to the adequacy of the Noxious Weed Plan are without merit.

Non-native species in natural areas. Ms. Geer's argument about non-native invasive species in natural areas is outside the scope of Issue FW-6. Issue FW-6 asks whether the Noxious Weed Plan provides adequate mitigation for potential habitat loss due to noxious weed infestations resulting from project-related activities; it does not encompass the presence of non-native invasive species in natural areas. Moreover, even if Ms. Geer had properly raised this argument, no Council siting standard requires prevention or eradication of non-native invasive plant species as a condition for siting an energy facility. Treatment of non-native invasive plant species is a matter outside of the Council's jurisdiction and there is no authority for the Council to require that Idaho Power prevent or eliminate all non-native invasive plant species in natural areas within the site boundary.

Monitoring and control responsibilities. Contrary to Ms. Geer's contention, the Noxious Weed Plan does not relieve Idaho Power of monitoring and control responsibilities after five years. As discussed above with regard to Issue FW-3, the updated draft Plan establishes a five-year initial assessment period, after which Idaho Power will prepare a location-specific long-term monitoring plan to ensure control or mitigation of all project-related

¹¹⁶ See discussion *infra* in connection with Issue M-6 and limited party Marlette's contention that the Council should provide the public an additional opportunity to review and comment on all draft monitoring and mitigation plans prior to approving a site certificate.

noxious weed infestations.¹¹⁷ This five-year initial assessment period followed by a long-term monitoring plan is consistent with past Council orders and in compliance with the Fish and Wildlife Habitat standard. Ms. Geer has not demonstrated otherwise.

Mitigation for loss of habitat. To the extent Ms. Geer contends that the Fish and Wildlife Habitat Mitigation Plan is inadequate or that the habitat categories addressed therein are overly broad, these arguments fall outside the scope of Issue FW-6. As previously discussed, Issue FW-6 is limited to whether the Noxious Weed Plan provides adequate mitigation for potential adverse impacts from noxious weeds resulting from project construction and/or operation. Ms. Geer has not demonstrated that the Noxious Weed Plan is inadequate for its stated purpose.¹¹⁸

Compensatory mitigation. Ms. Geer asserts that none of the draft plans (Reclamation and Revegetation, Habitat Mitigation, and draft Noxious Weed) suffices to compensate landowners for the loss of high-quality native habitat. She also asserts that the mitigation goal of no net loss is “becoming a controversial practice,” and that even mitigation that fulfills legal requirements often fails to fully compensate for lost habitat. Geer Closing Argument at 17-18. First, this argument exceeds the scope of Issue FW-6, which as previously discussed, is limited to the adequacy of the weed monitoring and control provisions of the Noxious Weed Plan. Second, Ms. Geer’s challenge is misplaced because the goal of compensatory mitigation is not to compensate the landowner, but to compensate for the lost habitat. The Council’s Fish and Wildlife Habitat standard applies the ODFW Habitat Mitigation Policy, which is designed to address adverse impacts to fish and wildlife habitat, and not impacts to landowners. Furthermore, as Idaho Power notes in its Response Brief, if a landowner is adversely impacted by habitat loss, the Company will address this during negotiations with the landowner related to the ROW for the project. These negotiations occur outside the site certificate process and the Council’s jurisdiction.

In summary, a preponderance of the evidence establishes that the updated draft Noxious Weed Plan is adequate to serve its intended purpose, setting out the measures the Company will take to control noxious weed species and prevent the introduction of these species during construction and operation of the project. Ms. Geer has not presented evidence or persuasive argument that brings into question the validity of the updated draft Noxious Weed Plan or Idaho Power’s ability to implement and adhere to the plan when finalized.

Proposed site certificate conditions related to Issue FW-6:

In an addendum to her closing brief on Issues FW-3 and FW-6, Ms. Geer proposed an additional site certificate condition. She requested that Idaho Power electronically share the data

¹¹⁷ See Taylor Rebuttal Exhibit B at page 36 (updated draft Noxious Weed Plan, Section 6.1).

¹¹⁸ As the Department notes in its Closing Brief, Idaho Power’s mitigation for potential habitat loss is not limited to the requirements of the draft Noxious Weed Plan. The Council’s evaluation of whether the proposed facility meets the requirements of OAR 345-022-0060 is collectively based on the draft Reclamation and Revegetation Plan, the draft Habitat Mitigation Plan and draft Noxious Weed Plan. ODOE Closing Brief at 24.

on noxious weeds and revegetation success required under Section 6.0 of the Reclamation and Revegetation Plan “in a user-friendly format with other Oregon state agencies, affected landowners, and upon request to any interested member of the public.” Geer Addendum to Closing Brief, February 28, 2022 at 1. This condition is addressed under the evaluation of Geer’s proposed conditions for FW-3.

Ruling on Idaho Power’s Motion to Strike Portions of Ms. Geer’s Closing Argument for FW-6:

With regard to Issue FW-6, Idaho Power moves to strike statements in Ms. Geer’s Closing Argument that Idaho Power contends are outside the scope of the issue. Specifically, Idaho Power moves to strike statements challenging the adequacy of the Fish and Wildlife Habitat Mitigation Plan, statements asserting the Noxious Weed Plan must separately address noxious weeds in natural areas, and statements pertaining to the Council’s General Standard of Review. Idaho Power’s Response Brief and Motion to Strike, Issue FW-6, at 5-7.

The ALJ agrees that the challenged statements in Ms. Geer’s Closing Argument are outside the scope of Issue FW-6. Issue FW-6 asks whether the Noxious Weed Plan provides for adequate weed monitoring and control provisions when it appears to relieve Idaho Power of responsibility after five years. Issue FW-6 does not involve a challenge to the adequacy of the Fish and Wildlife Habitat Mitigation Plan. Therefore, the ALJ gives no weight to Ms. Geer’s arguments regarding the Fish and Wildlife Habitat Mitigation Plan. Furthermore, Ms. Geer did not timely raise her concerns about weed control measures in natural areas or compliance with the General Standard of Review (OAR 345-022-0000). Therefore, the ALJ does not consider her arguments on those matters.

Riparian area setbacks – Issue FW-5

Issue FW-5: Whether Applicant should be required to mitigate impacts to riparian areas from the setback location to the outer edges of the riparian area because the riparian habitat should be rated as Category 2 at a minimum.

Ms. Gilbert has standing on Issue FW-5. She waived her opportunity to submit witness testimony or additional evidence on this issue. Therefore, she is limited in her closing arguments to relying on evidence previously admitted into the evidentiary record as part of the B2H Project Record.¹¹⁹ In her closing argument, Ms. Gilbert argues that: (1) under ODFW habitat mitigation rules, all fish bearing water sources and riparian area habitats should be rated as Category 1, or Category 2 as a minimum; and (2) the BLM’s FEIS requires a 300-foot setback and, based on

¹¹⁹ See *Ruling on Motion to Dismiss* at 4-6.

ORS 469.310¹²⁰ and ORS 469.370(13),¹²¹ the Council should require that same setback be incorporated into the site certificate. Gilbert Closing Brief at 2-6.

With regard to habitat characterization, Ms. Gilbert argues that “[t]he plain language of the ODFW habitat mitigation rules lead an individual to conclude that the presence of specific wildlife species at a site would impact the category of habitat the area is assigned.” Gilbert Closing Brief at 5. She further asserts that the Department and Council have misinterpreted the ODFW’s habitat mitigation rule and that their interpretation of required mitigation for riparian habitat impacts is not entitled to deference. Gilbert Closing Brief at 7-8. However, contrary to Ms. Gilbert’s contention, even according to ODFW’s interpretation of OAR 635-415-0025, the mere presence of a special status species or a migratory versus resident fish does not automatically elevate the habitat categorization of a given area.¹²² Therefore, the Department’s reading of the habitat categorization rule (*i.e.*, that fish species can exist within a degraded habitat and the existence of a state-listed threatened and endangered species does not meet the definition of a Category 1 habitat)¹²³ is consistent with ODFW’s interpretation of its own rule.

Furthermore, as set out in the findings, the Department addressed and approved Idaho Power’s methodology for identifying the types and locations of habitat, including riparian habitats, affected by the proposed facility. In the Proposed Order, the Department also noted that ODFW staff thoroughly reviewed Idaho Power’s habitat categorization methodology. Both ODFW and the Department approved Idaho Power’s approach to assigning habitat categories (Category 2 or Category 3) to riparian habitat areas.¹²⁴ The Department also noted that the mere presence of special status species in fish bearing streams does not require identifying riparian areas as Habitat Category 2.¹²⁵

As to the extent of the setbacks, Ms. Gilbert has not provided any evidence or identified any statute or rule requiring greater riparian setbacks than those included in the Proposed Order. Contrary to Ms. Gilbert’s contention, the Fish and Wildlife Habitat standard does not require or establish particular setbacks from fish bearing streams. Rather, the standard requires consistency with ODFW’s habitat mitigation goals and standards. For Category 2 habitats, OAR 635-415-

¹²⁰ ORS 469.310 sets out the policy for energy facilities in Oregon: “[I]t is the declared public policy of this state that the siting, construction and operation of energy facilities shall be accomplished in a manner consistent with protection of the public health and safety and in compliance with the energy policy and air, water, solid waste, land use and other environmental protection policies of this state.”

¹²¹ ORS 469.370(13) requires the Council to “conduct its site certificate review, to the maximum extent feasible, in a manner that is consistent with and does not duplicate the federal agency review.”

¹²² Reif Cross-Exam. Test., Tr. Day 5 at 84-85.

¹²³ See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 316 of 10016, n. 321.

¹²⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 316-18 of 10016.

¹²⁵ See also Reif Cross-Exam. Test., Tr. Day 5 at 84-85.

0025 does not require specific setbacks, application of federal habitat protections, or complete avoidance of impacts. Rather, under ODFW's rule, the Category 2 mitigation goal is no net loss of either habitat quantity or quality and to provide a net benefit of habitat quantity. For the project at issue, mitigation for temporary and permanent impacts would occur via revegetation and long-term acquisition and enhancement of mitigation lands, which are consistent with the ODFW's Category 2 and 3 mitigation goals.

In summary, Ms. Gilbert has not established that Idaho Power is required to mitigate impacts to riparian areas from the setback location to the outer edges of the riparian area or that all riparian habitat areas should be designated ODFW Habitat Category 2 at a minimum. A preponderance of the evidence in the record supports the riparian setbacks identified in the Proposed Order.

Proposed site certificate conditions related to Issue FW-5:

In her Closing Brief on Issue FW-5, Ms. Gilbert submitted two proposed conditions related to setbacks in riparian areas.¹²⁶ Because Ms. Gilbert did not submit these proposed conditions to the ALJ in a timely manner in accordance with the schedule set in the *Case Management Order*,¹²⁷ there is no need to address their necessity or appropriateness. Nevertheless, based on the discussion of Issue FW-5 above, both proposed conditions are unnecessary and inappropriate because Idaho Power is not required to have a 300-foot setback in riparian areas.

Ruling on Idaho Power's Motion to Strike Portions of Ms. Gilbert's Closing Brief on Issue FW-5:

¹²⁶ Ms. Gilbert included proposed the following conditions in her Closing Brief on Issue FW-5, :

(1) Prior to the start of construction in areas within 300 feet of water sources, wildlife surveys must be completed to determine if the habitat is supporting wildlife listed as threatened or endangered. Every effort should be made to avoid the riparian area extending 300 feet from the water source. Any construction activity occurring in the riparian area will require mitigation for direct impacts as well as mitigation for indirect impacts in an area extending up to 300 feet from the location of the activity.

(2) Developer will avoid construction in the riparian zone extending 300 feet from water sources. Direct and indirect impacts to riparian areas within 300 feet of water containing fish require habitat mitigation be provided at a minimum of Category 2 level.

Gilbert Closing Brief Issue FW-5 at 8.

¹²⁷ Pursuant to OAR 345-015-0085(1), "parties shall submit proposed site certificate conditions to the hearing officer in writing according to a schedule set by the hearing officer." In this matter, the deadline for submitting written direct testimony, evidence, and any proposed site certificate conditions was September 17, 2021. *Case Management Order* at 16, 18. See also *Ruling on Motion to Dismiss* at 6 ("Because Ms. Gilbert waived the opportunity to submit witness testimony and any new evidence, her presentation on Issue FW-5 is limited to argument based on evidence previously admitted into the contested case record as part of the B2H Project Record.")

In the motion, Idaho Power moves to strike statements in Ms. Gilbert's brief that reference documents that are not part of the evidentiary record and/or that raise arguments outside the scope of Issue FW-5. Specifically, Idaho Power moves to strike statements that reference the Oregon Integrated Water Resources Strategy,¹²⁸ statements that reference the Total Maximum Daily Load (TMDL) for the Upper Grande Ronde Sub-Basin,¹²⁹ and a general reference to the "federal register regarding fish present" in streams near the project.¹³⁰ Alternatively, Idaho Power asks that these challenged statements be given no weight. Issue FW-5 Motion to Strike at 4-5.

The ALJ agrees that the Oregon Integrated Water Resources Strategy and the TMDL for the Upper Grande Ronde Sub Basin are not part of the B2H Project Record and that Ms. Gilbert is not entitled to reference or rely upon these documents in her Closing Brief on Issue FW-5. Therefore, the ALJ gives these challenged statements no weight. Furthermore, Ms. Gilbert's reference to the federal register is entitled to no weight, because she has not cited any specific code provision.

Fish Passage Plans – Issue FW-7

Issue FW-7: Whether Applicant's Fish Passage Plans, including 3A and 3B designs, complies with the Fish and Wildlife Habitat standard's Category 2 mitigation requirements; whether Applicant must revisit its plans because threatened Steelhead redds have been identified in the watershed.

Limited parties Ann and Kevin March have standing on Issue FW-7. The Marches contend that Idaho Power cannot demonstrate compliance with ODFW's Habitat Category 2 mitigation goals or the Fish Passage rules because streams designated as non-fish bearing in the ASC may actually provide habitat for Snake River Basin steelhead.¹³¹ The Marches further assert that Idaho Power bears the burden to identify all streams that may provide habitat for

¹²⁸ See Gilbert Closing Brief Issue FW-5 at 6 ("Oregon's Integrated Water Resources Strategy from August 2012 indicates that * * *").

¹²⁹ See *id.* ("* * * the results are made abundantly clear in the report regarding the Upper Grande Ronde Sub-Basin TMDL by the Oregon Department of Environmental Quality from 2000.").

¹³⁰ See *id.* at 2.

¹³¹ The Marches also fault the ODFW for not undertaking habitat surveys in the Ladd Creek watershed since the Oregon Department of Transportation completed the I-84 improvement project in 2018 and for not identifying Snake River Basin steelhead in the watershed. They argue that ODFW is not complying with its own Habitat Mitigation requirements and Fish Passage rules. See March Closing Brief at 7-12. However, the Marches' challenge to the adequacy of ODFW's surveys and studies falls outside the Council's jurisdiction and the scope of Issue FW-7. Also, as the Department notes in its Response Brief, the fact that ODFW may not have the capacity and had not prioritized spawning surveys in the Ladd Creek watershed is immaterial to the Council's review of Idaho Power's ability to comply with the Fish and Wildlife Habitat standard or the Fish Passage Law. Department Response at 22.

Snake River Basin Steelhead and to “definitively state” which streams in the upper Ladd Creek watershed are not capable of providing fish habitat. March Closing Brief at 2, 16, 24.

As an initial matter, the Marches misstate the burden of proof for purposes of establishing compliance with the Council standards in general, and OAR 345-022-0060 in particular. In general, Idaho Power has the burden of proving by a preponderance of the evidence in the decision record that the facility complies with all applicable statutes, administrative rules and applicable local government ordinances. OAR 345-021-0100(2). More specifically, under the Fish and Wildlife Habitat standard, Idaho Power must provide information demonstrating that, more likely than not, the design, construction and operation of the proposed facility, taking into account mitigation, *are consistent with* the general fish and wildlife habitat mitigation goals and standards of OAR 635-415-0025. OAR 345-022-0060. Contrary to the Marches’ contention, however, to establish compliance with the Fish and Wildlife Habitat standard and/or the Fish Passage rules, Idaho Power does not have to “definitively state” whether Snake River Basin steelhead have entered the upper Ladd Creek watershed and/or whether Snake River Basin Steelhead have populated streams previously categorized as non-fish bearing.

The following points are important to keep in mind in resolving Issue FW-7: First, Idaho Power categorized all potentially fish bearing streams in the upper Ladd Creek watershed above the I-84 culvert within the site boundary as Habitat Category 2.¹³² Therefore, the potential presence of Snake River Basin Steelhead in these streams would not change the habitat designation. Second, Idaho Power is not proposing construction of new road crossings or major replacement of existing road crossings on any identified streams in the upper Ladd Creek watershed.¹³³ Consequently, there no need for Idaho Power to prepare a Fish Passage Plan for any of the crossings in the upper Ladd Creek watershed regardless of the potential presence of Snake River Basin Steelhead in these streams because all proposed project-related crossings in the upper Ladd Creed watershed will rely on the existing bridges or culverts.¹³⁴

In their Closing Brief, the Marches argue that “OAR 635-415-0020 is not fulfilled because of a lack of studies and data since the completion of the I-84 Fish Passage Improvement Project.” March Closing Brief at 26. However, contrary to the Marches’ contention, and as discussed above, Idaho Power is not obligated to satisfy the provisions of OAR 635-415-0020 (Implementation of Department Habitat Mitigation Requirements). Rather, pursuant to OAR 345-022-0060 (Fish and Wildlife Habitat), Idaho Power is required to show, by a preponderance of the evidence, that taking into account mitigation, the design, construction and operation are “consistent with” the mitigation goals and standards of OAR 635-415-0025(1) through (6).

¹³² James Rebuttal Test. at 19-20; *see also* ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 315-316 of 10016.

¹³³ James Rebuttal Test. at 18 (“Regardless of whether the streams in the upper Ladd Creek watershed were identified as fish-bearing or non-fish-bearing, the Fish Passage Plan and Fish Passage Approval requirements are not triggered because Idaho Power is not proposing construction of any new, or major replacement of existing, artificial obstructions on any of the road-stream crossings in that watershed.”)

¹³⁴ James Rebuttal Test. at 18-19.

Idaho Power has done so in ASC Exhibit P1, Attachment P1-6.¹³⁵ Furthermore, to the extent the Marches' assert that the ODFW has not complied with OAR 635-415-0020 because it has not studied or surveyed the Ladd Creek watershed since ODOT completed the I-84 Fish Passage Improvement Project, that claim falls outside the Council's jurisdiction.

The Marches next argue that "OAR 345-021-0010(1)(p) is not fulfilled because no presence of threatened and sensitive [Snake River Basin Steelhead] was documented in the Ladd Creek watershed." March Closing Brief at 26. However, as discussed above, Idaho Power has no obligation to document the presence of this species in the Ladd Creek watershed in ASC Exhibit P1 in order to establish compliance with the Fish and Wildlife Habitat standard.

The Marches further contend that Idaho Power has presented "incomplete fish passage data" and that "OAR 635-412-0020 may not be fulfilled due to the lack of assumed native migratory fish presence and a lack of data verifying a 'non-fish' designation at 5 crossings." March Closing Brief at 26. First, as previously discussed, Idaho Power has no obligation to definitively show that streams labeled non-fish bearing in the Ladd Creek watershed do not, in fact, bear Snake River Basin Steelhead (or other fish species) to establish compliance with the Council's standards. Second, because Idaho Power does not propose to construct fish passage obstructions for any of the crossings in the upper Ladd Creek watershed, the Fish Passage Approval rules are not triggered in that watershed and the Company is not required to prepare a Fish Passage Plan for any of these crossings. Third, as discussed below, the Department has recommended amending Fish Passage Condition 1 to address the concern that the ODFW was not able to definitively affirm the non-fish bearing designation of the five non-fish road-stream crossings in the upper Ladd Creek watershed identified in ASC Exhibit P1-7B, Table 3. Recommended Amended Fish Passage Condition 1 and Recommended Fish and Wildlife Condition 4 will ensure that any new information regarding fish use arising prior to construction will be addressed.

The Marches also argue that "OAR 635-412-0035 may not be fulfilled because of a lack of data from ODFW and [Idaho Power] in regards to streams labeled as 'non-fish' streams." March Closing Brief at 26. This argument lacks merit for the same reasons stated above. OAR 635-412-0035 (Fish Passage Criteria) only applies where there is a proposal to construct an artificial obstruction across waters of the state inhabited or historically inhabited by native migratory fish. OAR 635-412-0020(1). Here, Idaho Power does not propose construction or major replacement of any artificial obstructions in the upper Ladd Creek watershed, therefore the proposed project will not trigger the Fish Passage Approval requirements in the upper Ladd Creek watershed.¹³⁶

¹³⁵ ODOE - B2HAPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, pages 773-940 of 940. *See also* ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 326-329 of 10016.

¹³⁶ Furthermore, in the event updated information required by Recommended Fish Passage Condition 1 indicates that streams previously designated non-fish bearing are, in fact, fish bearing *and* Idaho Power subsequently revises its proposal to include construction of an artificial obstruction at such a crossing location (thereby triggering the Fish Passage requirements), then Recommended Amended Fish Passage

Finally, the Marches assert that the ASC is missing ephemeral stream habitat data and that “OAR 635-021-0010 (1)(p)(D)(E)(F) and OAR 635-412-0020 are not fulfilled due to an assumed ‘non-fish’ designation of ephemeral streams and a lack of data to support this designation.” March Closing Brief at 26. As the Department notes, this is a new contention not previously raised in the Marches’ petition for party status or the evidence submitted in support of Issue FW-7. Department Response to Closing Arguments at 20. Idaho Power similarly argues that this contention (compliance with the content requirements of OAR 345-021-0010(1)(p)) is outside the scope of Issue FW-7. Idaho Power’s Response Brief for Issue FW-7 at 68. The ALJ agrees. Because the Marches raised this contention for the first time in their Closing Brief, neither the Department nor Idaho Power had the opportunity to respond to this challenge with rebuttal evidence. Therefore, this particular contention (failure to include ephemeral stream habitat data in the ASC) is not properly before the ALJ.¹³⁷

In summary, in the Proposed Order, the Department found that, assuming compliance with the recommended Fish Passage condition, the proposed facility complies with the Fish Passage Requirements of OAR chapter 635, division 412. The Marches have not demonstrated otherwise. The Department further found that, assuming compliance with recommended Fish and Wildlife conditions (in particular, Recommended Fish and Wildlife Condition 4 pertaining to the Fish and Wildlife Habitat Mitigation Plan) the proposed facility is consistent the ODFW habitat mitigation goals and standards described in OAR 635-415-0025. The Marches have not demonstrated otherwise. The presence of Snake River Basin Steelhead in the upper Ladd Creek watershed does not alter these determinations.

Proposed site certificate conditions related to Issue FW-7:

In response to testimony filed by the Marches on Issue FW-7, the Department proposed a revision to Recommended Fish Passage Condition 1(a), to require a re-evaluation of streams identified as non-fish bearing in the Ladd Creek watershed as part of finalizing the Fish Passage Plan.

ODOE Recommended Amended Fish Passage Condition 1(a):¹³⁸

a) Prior to construction, the certificate holder shall finalize, and submit to the Department for its approval in consultation with ODFW, a final Fish Passage Plan. As part of finalizing the Fish Passage Plan, the certificate holder shall

Condition 1 would require that Idaho Power seek Council approval of a site certificate amendment to incorporate ODFW approval and fish passage design/plan for the road-stream crossing.

¹³⁷ Moreover, and contrary to the Marches’ unsupported assertion, evidence in the record demonstrates that, to the greatest extent possible, Idaho Power surveyed all potential fish-bearing stream crossings, regardless of perennial, intermittent, or ephemeral designation. *See* ODOE - B2HAPPDoc3-28 ASC 16A_Exhibit P1_Wildlife_ASC_Part 3_Attach P1-7B 2018-09-28, page 10 of 164

¹³⁸ The new/amended language is in bold.

request from ODFW any new information on the status of the streams within the site boundary and shall address the information in the final Fish Passage Plan. **In addition, the certificate holder shall seek concurrence from ODFW on the fish-presence determinations for non-fish bearing streams within the Ladd Creek watershed, as presented in ASC Exhibit P1-7B Table 3. If the certificate holder in consultation with ODFW, determines any of the previously identified non-fish bearing streams within the Ladd Creek Watershed to be fish-bearing, the certificate holder shall complete a crossing risk evaluation and obtain concurrence from ODFW on applicability of fish passage requirements. If fish passage requirements apply, certificate holder shall seek approval from the Energy Facility Siting Council of a site certificate amendment to incorporate ODFW approval of new crossings and fish passage design/plans and conditions.** The protective measures described in the draft Fish Passage Plan in Attachment BB-2 to the Final Order on the ASC, shall be included as part of the final Fish Passage Plan, unless otherwise approved by the Department.

ODOE Rebuttal to Direct Testimony at 43.

Idaho Power does not oppose the revision/amendments to the Department's Recommended Amended Fish Passage Condition 1. Given the Department's recommendation and Idaho Power's assent, the ALJ recommends that the Council approve this proposed revision/amendment.

The Marches timely proposed seven additional site certificate conditions related to Issue FW-7.¹³⁹ Both the Department and Idaho Power contend that these proposed conditions are unnecessary, inappropriate and unsupported by evidence in the record.

March Proposed FW Condition 1: Prior to the start of construction, Idaho Power will request that the Oregon Department of Fish and Wildlife undertake and complete a formal analysis and survey of the Ladd Creek Watershed for Snake River Basin Steelhead.

This proposal is both unnecessary and inappropriate. It is unnecessary because, as discussed above, the presence of Snake River Basin Steelhead in the Ladd Creek watershed will not change the habitat category or the fact that Idaho Power is not proposing to construct or replace any crossings on streams in this watershed. It is inappropriate because requests to the ODFW fall outside the Council's jurisdiction. Therefore, this proposed condition is denied.

March Proposed FW Condition 2: Prior to the start of construction, Idaho Power will request of the National Oceanographic and Atmospheric Administration that the agency undertake a 2.11 Re-initiation of Consultation. This can and should be undertaken [] if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered.

¹³⁹ See Site Certificate Conditions of Anne and Kevin March Issue FW-7, filed September 17, 2021.

This proposal is both unnecessary and inappropriate because implementation of the federal Endangered Species Act and requests to NOAA fall outside the Council's jurisdiction. Accordingly, this proposed condition is denied.

March Proposed FW Condition 3: Prior to the start of construction, Idaho Power will request that the Record of Decision be revisited once this new information is entered into the NOAA database.

This proposal is both unnecessary and inappropriate because the BLM's Record of Decision is a matter outside the Council's jurisdiction. Therefore, this proposed condition is denied.

March Proposed FW Condition 4: Idaho Power shall revise its plans for the Ladd Creek Watershed once it receives this information from ODFW and NOAA, to accurately reflect migration patterns of Snake River Basin Steelhead and its spawning and rearing habitat.

This proposal is unnecessary and inappropriate because, as discussed previously, the assumed distribution of Snake River Basin Steelhead in the upper Ladd Creek watershed does not change the habitat category nor does it trigger the Fish Passage Approval requirements. Accordingly, this proposed condition is also denied.

March Proposed FW Condition 5: Idaho Power shall adjust its construction work window plans to accommodate this species and its habitat with no loss of fish or net loss of critical habitat.

This proposal is unnecessary and inappropriate because Idaho Power does not propose construction or major replacement of any stream crossings in the upper Ladd Creek watershed (where the Marches contend that Snake River Basin Steelhead are present). In the absence of any proposed construction there is no need to impose seasonal restrictions on when construction may occur. Consequently, this proposed condition is denied.

March Proposed FW Condition 6: Idaho Power shall create a mitigation plan for the Ladd Creek Watershed based on the presence of Threatened Snake River Basin Steelhead.

This proposal is unnecessary and inappropriate because the presence of Snake River Basin Steelhead in the Ladd Creek watershed will not change the habitat category or the fact that Idaho Power does not propose construction or replacement of stream crossings in this watershed. Therefore, this proposed condition is denied.

March Proposed FW Condition 7: Idaho Power shall create a Fish Plan in conjunction with ODFW that incorporates this data of historic and present use of Snake River Basin Steelhead in the Ladd Creek Watershed for migration and spawning and rearing habitat.

For the same reasons set out above, this proposal is unnecessary and inappropriate. The assumed distribution of Snake River Basin Steelhead in the upper Ladd Creek Watershed does not, in and of itself, trigger the Fish Passage Approval requirements. Moreover, the Fish Passage Rules require a Fish Passage Plan for a specific crossing or obstruction, rather than for the entirety of a watershed. Therefore, this proposed condition is also denied.

Historic, Cultural and Archeological Resources Standard

The HCA standard, OAR 345-022-0080, provides in pertinent part:

[T]o issue a site certificate, the Council must find that the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impacts to:

- (a) Historic, cultural or archaeological resources that have been listed on, or would likely be listed on the National Register of Historic Places;
- (b) For a facility on private land, archaeological objects, as defined in ORS 358.905(1)(a), or archaeological sites, as defined in 358.905(1)(c); and
- (c) For a facility on public land, archaeological sites, as defined in ORS 358.905(1)(c).

Oregon Trail resources – Issues HCA-3, HCA-4 and HCA-6

Issue HCA-3: Whether Historic, Cultural and Archeological Resources Condition [2] (EFSC HPMP) related to mitigation for crossings of Oregon Trail resources provides adequate mitigation for visual impacts and sufficient detail to allow for public participation.

Limited parties Gilbert and Marlette have standing on Issue HCA-3. They both contend that Idaho Power has not provided sufficient evidence to support a finding of compliance with the HCA standard because the EFSC HPMP does not clearly identify the historic resources, potential adverse visual impacts to those resources, and site-specific mitigation plans. (Marlette Closing Brief, Issue HCA-3; Gilbert Closing Brief, Issue HCA-3). Ms. Gilbert adds that Idaho Power is treating the Oregon Trail as a single historic site, and therefore it must identify all impacts for the entire transmission line and appropriate mitigation before the Council can approve a site certificate. She asserts that the project “requires this evaluation to occur prior to the start of construction on any section of the proposed transmission line. This information must be provided in order to make an eligibility determination, not afterwards.” Gilbert Closing on Issue HCA-3 at 4-5; *see also* 15-17. Ms. Gilbert also argues that the Council cannot determine whether the proposed facility is not likely to result in significant adverse impacts to historic resources until Idaho Power surveys the entirety of the analysis area. *Id.* at 19-20.

First, it is important to note that the proposed facility will not result in direct physical

disturbance to any listed or likely NRHP-eligible Oregon Trail segments. The proposed facility will, however, cross or be visible from Oregon Trail segments and therefore will indirectly impact these resources.¹⁴⁰ Second, and contrary to the limited parties' contentions, the HCA standard does not require that Idaho Power complete all tasks to ensure that project impacts to historical or cultural resources are avoided, minimized or mitigated to less than significant prior to issuance of a site certificate. As the Department noted in the Proposed Order, some tasks (including the cultural resource survey data based on final design and site access) may be completed and submitted for review *after* issuance of a site certificate and prior to construction:

Pursuant to OAR 345-015-0190(5), an ASC is complete when the Department finds that the applicant has submitted information adequate for the Council to make findings or impose conditions on all applicable Council standards. Further, under ORS 469.401(2), the site certificate shall contain conditions that ensure compliance with the standards, statutes and rules that apply to the facility. Therefore, the Council may use the information in the record to make findings and impose conditions to ensure compliance with the Council standards that require surveys, *and the final survey information may be submitted for review prior to construction.*

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 53 of 10016; emphasis added.

In Section IV.K. of the Proposed Order, the Department specifically endorsed this process with regard to compliance with the HCA standard:

The Department, in coordination with SHPO and the BLM, and to be consistent with EFSC statute, determined the most prudent pathway to evaluate EFSC historic, cultural, and archaeological resource information is to align with the Section 106 federal review. * * *

To ensure that, based on the Section 106 compliance review, the resource inventory tables are provided to the Department and include updated impact assessment and mitigation measures via the [EFSC] HPMP to verify compliance with OAR 345-022-0090, the Department recommends the Council adopt Recommended Historic, Cultural, and Archaeological Resources Condition 2, outlined further below. Final impact avoidance, minimization, and mitigation measures depends on which, if any, of the subsection of the EFSC Historic, Cultural, and Archaeological Resources standard apply (OAR 345-022-0090(1)(a) through (c)). Because the EFSC standard relies upon the determinations that will result from the Section 106 compliance review, the Department recommends Historic, Cultural, and Archaeological Resources Condition 2, require the final HPMP to be submitted to the Department, SHPO and applicable Tribal government reviewing agencies *once the lead federal agency eligibility determinations have been established and based upon final design of the phase or segment of the proposed facility.* The Department recommends the applicant

¹⁴⁰ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 449 of 10016.

provide county-specific mitigation measures for impacts to NHT/Oregon Trail resources.

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 512-13 of 10016; emphasis added.

Ms. Gilbert next argues that, as part of establishing compliance with the HCA Standard, Idaho Power must demonstrate compliance with the Programmatic Agreement and NHPA Section 106 requirements. Gilbert Closing on HCA-3 at 7-12. Simply stated, and contrary to Ms. Gilbert's contention, Idaho Power is not required to demonstrate compliance with NEPA Section 106 or the PA for purposes of the Council's review because the Council does not enforce compliance with federal laws.

In her opening argument on Issue HCA-3, Ms. Gilbert specifically challenges the methodology Idaho Power used to assess visual impacts to historic properties for purposes the HCA standard. She notes that Idaho Power used a different method to assess impacts for EFSC than it did for the BLM. She questions whether "the EFSC review can be accepted as meeting NEPA requirements." Gilbert Opening on IICA-3 at 4. This contention falls outside the scope of Issue HCA-3, which is limited to the adequacy of the EFSC HPMP. Further, as noted above, for purposes of the Council's review under the Council rules, Idaho Power is not required to demonstrate compliance with the PA and BLM HPMP.

The Council's HCA standard does not mandate any specific methodology for assessing visual impacts. Furthermore, as set out in the Rebuttal Testimony of Kirk Ranzetta, the BLM and SHPO methodologies for assessing visual impacts do not completely align with the information an applicant must provide for Council review under the HCA standard, particularly in light of the Council's definition of "significant" adverse impacts in OAR 345-001-0010(52).¹⁴¹ Nevertheless, as discussed above, Idaho Power coordinated with the BLM, SHPO and Department in developing its methodology for assessing visual impacts to historic properties (VAHP Study Plan) and incorporated pertinent aspects of the BLM methodology and the SHPO methodology into its plan.¹⁴² Idaho Power used, and will continue to use, this same methodology to ascertain the potential effects to historic properties and cultural resources for the entire length of the proposed transmission line.¹⁴³

¹⁴¹ Ranzetta Rebuttal Test. at 79-81. OAR 345-001-0010(52) states:

"Significant" means having an important consequence, either alone or in combination with other factors, based upon the magnitude and likelihood of the impact on the affected human population or natural resources, or on the importance of the natural resource affected, considering the context of the action or impact, its intensity and the degree to which possible impacts are caused by the proposed action. Nothing in this definition is intended to require a statistical analysis of the magnitude or likelihood of a particular impact.

¹⁴² Ranzetta Rebuttal Test. at 80-81.

¹⁴³ *Id.*

The PA is not a binding document in the Council review process. The VAHP Study Plan, which as noted above, was prepared in consultation with the Section 106 Cultural Resources Working Group, provides a reasonable and appropriate method for assessing indirect impacts from the project for purposes of the HCA standard. Furthermore, the EFSC HPMP, prepared specifically for the Department and to comply with the Council's certification process, provides adequate mitigation measures for visual impacts to historic and cultural resources.

In her Response Brief, Ms. Marlette argues that the proposed facility will have a substantial adverse impact on the National Historic Oregon Trail because the transmission line will be visible from the trail segments and NHOTIC. She argues that Idaho Power's proposed mitigation methods do not sufficiently protect against significant and permanent adverse impacts, and that even indirect impacts should be avoided, rather than minimized or mitigated. (Marlette Response at 1-3.) Ms. Gilbert, in her response, similarly argues that the proposed facility will "permanently and seriously degrade" the Oregon Trail resources within the state and that there is no way to mitigate for impacts that will reduce the visual impact to less than significant to areas such as NHOTIC.¹⁴⁴ (Gilbert Response at 1-3.)

The limited parties state their concerns, but they provide no persuasive evidence to support the contention that the proposed facility will result in significant adverse impacts to Oregon Trail resources that cannot be adequately mitigated. In the Proposed Order, the Department evaluated Idaho Power's proposed mitigation for indirect impacts to Oregon Trail resources¹⁴⁵ and recommended mitigation for indirectly affected Oregon Trail segments, all to be included in the EFSC HPMP.¹⁴⁶ The Department noted:

[M]itigation established through the federal Section 106 compliance review may be used to satisfy the EFSC mitigation requirement for listed or likely NRHP-eligible Oregon Trail/NHT trail segments if applicant can demonstrate that it addresses both the design modifications and the restoration; preservation and maintenance; or compensation mitigation within affected area (county), as included in the below Table HCA-4b (included in the HPMP). If not duplicated through the federal Section 106 process, the applicant shall establish the scope and scale of Table HCA-4b mitigation, prior to construction, subject to Department review and approval, in consultation with SHPO, its consultants, or

¹⁴⁴ To the extent Ms. Gilbert seeks to apply the visual impact assessment requirements of the Council's Scenic Resources or Protected Area standard, or of the NEPA Section 106 process, to the HCA standard, her arguments are misplaced. The Scenic Resources and Protected Area standards are designed to measure different impacts to different resources than the HCA standard. Moreover, as previously discussed, the federal requirements for assessing cultural resources are also inapplicable to the HCA standard.

¹⁴⁵ See Proposed Order, Tables HCA-3 and HCA-4 (also included in the EFSC HPMP), ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 461-70 of 10016.

¹⁴⁶ See Proposed Order, Table HCA-5b (also included in the EFSC HPMP), ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 471-72 of 10016.

other entities with expertise with historic trails.

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 471 of 10016. Per the Department's recommendation, the EFSC HPMP requires that Idaho Power use design modification and at least one other mitigation measure, with a demonstrated direct benefit to the affected area. The limited parties have not demonstrated that these mitigation measures set out in the EFSC HPMP are inconsistent with the Council's definition of mitigation under OAR 345-001-0010(33).

Finally, the limited parties argue that the Court of Appeals' decision in *Gould v. Deschutes County*, 216 Or App 150 (2007), requires that the EFSC HPMP be adequately developed (*i.e.*, that it include all site-specific mitigation plans) prior to issuance of the site certificate and/or that the Council must defer consideration of the plan to allow public participation in the plan finalization. *See* Gilbert Closing on HCA-3 at 20; Marlette Closing at 5-6. The limited parties misconstrue *Gould* and its application in the context of the Council's review of an ASC. For the reasons discussed in more detail below (in connection with Issue M-6),¹⁴⁷ *Gould* does not require further public review and comment of the EFSC HPMP prior to finalization of the plan and/or Council's approval of the site certificate. *See* ORS 469.402 (authorizing the Council to delegate the approval of a future action to the Department).

In summary, a preponderance of the evidence establishes that the EFSC HPMP provides adequate mitigation for visual impacts to HCA resources. Recommended HCA Condition 2 requires that Idaho Power conduct all construction activities in compliance with the final Department-approved EFSC HPMP. The Council's rules do not require further public review and comment on the EFSC HPMP prior to finalization and approval of the plan.

Proposed site certificate conditions related to Issue HCA-3:

Ms. Gilbert timely submitted one proposed condition in her opening argument brief regarding Issue HCA-3,¹⁴⁸ and several more proposed conditions related to the HCA standard in her closing brief on HCA-3, as discussed below.¹⁴⁹

¹⁴⁷ See the discussion of *Gould* in connection with Issue M-6 and Ms. Marlette's contention that the Council should provide the public an additional opportunity to review and comment on all draft monitoring and mitigation plans prior to approving a site certificate.

¹⁴⁸ Gilbert Contested Case Opening Argument Regarding Issue HCA-3 at 4. Ms. Gilbert also timely submitted two other proposed conditions related to the HCA Standard (related to the Programmatic Agreement and to visual analysis for historic places), which are discussed *infra*, under the heading *Gilbert Additional Proposed Site Certificate Conditions*.

¹⁴⁹ Gilbert Contested Case Closing Regarding Issue HCA-3 at 8, 10-13, 18-20. Two of the conditions proposed in Ms. Gilbert's closing brief are similar to those included in her September 17, 2021 submission: one requiring a cumulative effects assessment pursuant to 36 CFR § 800.5, and the other pertaining to the Programmatic Agreement and the requirement to identify and provide mitigation for historical properties within five miles of the transmission line. Conditions proposed by Ms. Gilbert are discussed *infra*, under the heading *Gilbert Additional Proposed Site Certificate Conditions*.

Gilbert Proposed HCA Condition: The developer must complete a visual analysis of all historic sites using the methods accepted and used by BLM in evaluating visual impacts.

Both the Department and Idaho Power oppose this proposed condition as unnecessary and inappropriate. The ALJ agrees. Under ORS 469.370(13), the Council shall conduct its site certificate review, to the maximum extent feasible, in a manner that is consistent with and does not duplicate the federal agency review. However, the Council's role is to ensure compliance with applicable state and local laws, not federal laws. As discussed above, there is no requirement under the Council's standard that Idaho Power use the BLM's methodology to assess visual impacts to historic properties.

Furthermore, Idaho Power has already aligned its visual impact assessment for the Council's review process with the BLM's Section 106 review process.¹⁵¹ Idaho Power included the Programmatic Agreement in the ASC. To assess compliance with the Council's HCA standard, Idaho Power prepared the VAHP Study Plan in consultation with the Section 106 Cultural Resources Working Group, which included the Department, SHPO, and the BLM. The VAHP Study Plan guided Idaho Power's visual assessment of above-ground cultural resources potentially affected by the construction and operation of the proposed facility, to determine whether the effects are adverse. Because the BLM's visual resource management responsibilities and impact assessment measures differ from the methods for inventorying and assessing the project's impacts on historical and cultural resources under the Council's standards, it is not appropriate to require Idaho Power to use the same assessment tools in this context.¹⁵²

In short, Ms. Gilbert has not demonstrated that this proposed condition is necessary or appropriate. The Department and Idaho Power have explained why it is unnecessary. Accordingly, the proposed condition is denied.

In her Closing Arguments, Ms. Gilbert proposed the following condition:

Gilbert Proposed HCA-3 Condition

1. Prior to the start of construction at any location along the proposed transmission line, the developer must provide site specific information regarding the direct and indirect impacts for all areas of the Oregon Trail (NHT) including camps, associated markers, glyphs or other trail elements located within 5 miles of the proposed transmission line. Documentation must include at least one photograph of the location directed toward the area where the transmission line would be visible. Information must include proposed site specific mitigation. The public will be provided an opportunity to review, comment and request a contested case. Council will make a determination regarding compliance with the standard and whether the recommended mitigation is adequate. Council determination will be included in the Final Historic Properties Management Plan issued prior to the start of construction. (OAR 345-022-0080; OAR 345-022-0090; OAR 660-015-0000(5) ORS 469.503 (1) and OAR 345-0020-0010)
2. The developer must provide documentation supporting their decision regarding the 229 objects and sites selected for ILS study which Idaho Power based their decision that only 39 had the potential to be [NRHP] eligible or meet one of the criteria. (Historic

Properties Management Plan, Boardman to Hemingway Transmission Line Project, September, 2018, Page 19)

3. Idaho Power must provide site specific information regarding impacts to all land which they claimed they could not access prior to obtaining a site certificate if they have or will access it prior to the issuance of a Site Certificate. This condition must be met prior to the issuance of a site certificate and the information must be made available for public disclosure, comment and contested case purposes per the justification provided in the body of this document.
4. All information provided post site certificate for locations which were not included in the original application based upon the "Energy Facility Siting Council Decisions for Linear Facilities site Restricted Access within a Site Boundary: Boardman to Hemingway Transmission Line" that is submitted after a site certificate is issued must be addressed with a Type A Amendment allowing the public access to a full contested case process due to the failure to disclose all accessible information to the public and the council during the original application process.

Idaho Power and Council oppose this proposed condition as unnecessary and inappropriate (IPC's March 30, 2022 Response Brief for Contested Case Issues HCA-3, HCA-4, HCA-6 and HCA-7, p.21-25).

Council evaluates each condition based on the substantive terms. For Proposed HCA-3 Condition 1, the condition would require: 1) preconstruction identification of Oregon National Historic Trail resources within 5-miles of the proposed transmission line; and an evaluation of direct and indirect impacts within 5-miles.

The applicant has already established a 2-mile direct study area, and 5-mile indirect study area (ODOE - B2HAPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, Page 9 of 783) – these study areas will apply at preconstruction finalization of impact and mitigation evaluation. Therefore, the existing indirect analysis and HPMP are based on the 5-miles Ms. Gilbert's proposed condition refers. The site certificate would authorize direct impacts within an approved site boundary, which is less than 300 feet wide. Therefore, there is no basis to require that the applicant evaluate potential direct impacts of the proposed transmission line to a distance of 5-miles.

Proposed HCA-3 Condition 1 would require preconstruction photographic documentation of Oregon Trail resources within 5-miles of the proposed transmission line.

In areas that the applicant had approved access for surveys during the ASC process, photographic documentation of Oregon Trail (NHT) resources has been provided in the record of this case (See ASC, Exhibit S, Errata Sheet at S-10 – S-70 (ODOE - B2HAPDoc3-55 ASC Exhibit S_Errata Info_Redacted 2019-03-06, Page 10-70 of 79). Photographic documentation of any additional Oregon Trail (NHT) resources not yet documented would be included under recommended HCA Condition 2, as presented in the Proposed Order. Recommended HCA Condition 1, as presented in the Proposed Order, requires avoidance of any direct, physical impacts to Oregon Trail (NHT) resources. Therefore, the proposed terms of Ms. Gilbert's HCA-3 Condition 1 ignore existing information on the record and the mechanics of recommended HCA Condition 2, which would provide the necessary photographic documentation of all

Oregon Trail (NHT) resources with a potential for indirect impact (within 5-miles of the proposed transmission line) as necessary to document the resource; and the type of mitigation that would be finalized and implemented for indirect impacts consistent with the requirements of the standard.

Gilbert's Proposed HCA-3 Condition 1 would require that, prior to construction, the photo documentation and site specific mitigation for Oregon Trail (NHT) resources within 5-miles of the proposed facility be subject to public review and comment; Council review and approval; and include appeal provisions.

Idaho Power is conducting a phased-approach for conducting surveys and evaluating resources and mitigation – the phased approach includes identification and field study for areas the site access had been obtained from landowners during the ASC phase; additional identification, field study and evaluation would be completed in the second phase at preconstruction, as required under the terms and conditions of the site certificate (HCA Condition 2). The phased approach could result in review of impacts and mitigation, following Council approval of the site certificate, which is allowable under ORS 469.402, if the circumstances are warranted. The Council finds that allowing a is warranted given the scope and scale of the project and study area, covering 1,500 miles for indirect impacts. Therefore, the Council maintains the authorization under ORS 469.402 to delegate the future review and approval, under ORS 469.402, of the HPMP to the Department, in consultation with the other state and tribal agencies and the Department's third-party consultant, which the Council considers to be appropriate.

Proposed HCA-3 Condition 2 would require that Idaho Power provide documentation supporting their decision regarding the 229 objects and sites selected for ILS study which Idaho Power based their decision that only 39 had the potential to be [NRHP] eligible or meet one of the criteria. The Council finds that these proposed terms go beyond the scope of HCA-3, which applies specifically to NRHP-eligible or likely eligible Oregon Trail resources. The record contains Idaho Power's evaluation and reasoning for its NRHP-eligibility recommendations for Oregon Trail (NHT) resources (ASC, Exhibit S, Errata at S-10 (ODOE - B2HAPPDoc3-55 ASC Exhibit S_Errata Info_Redacted 2019-03-06 Page 10 of 79). This proposed condition is therefore rejected.

Proposed HCA-3 Condition 3 would require that, prior to site certificate approval, Idaho Power submit site specific information for any lands they have subsequently gained survey access/permission to and allow the public an opportunity to review and comment on the potential impacts and mitigation. Council does not have authority to impose conditions that apply prior to issuing a site certificate.

Proposed HCA-3 Condition 4 would require that any new protected resources that would be impacted by the proposed facility require evaluation through a Type A amendment process. The Council finds this to be inappropriate and unnecessary. Requiring that any future identification of a protected resource that would be impacted, requiring mitigation, to automatically be reviewed under the Council's Type A review process is arbitrary and capricious. Department staff must evaluate an amendment request, and a request for Type B review if included, based on the facts of the amendment and specific factors pursuant to OAR 345-027-0357(8) or any other factors deemed appropriate for evaluating the appropriate procedural path for an

amendment. However, Type A review for applications to amend a site certificate is the default - a certificate holder must demonstrate in writing to the Department that Type B review is justified. If Type B review is determined justified by the Department, it is subject to review by Council (OAR 345-027-0357(6)). For these reasons, Council finds Proposed HCA-3 Condition 4 to be unnecessary.

Based on the reasoning and analysis presented above, Council rejects Gilbert's proposed HCA-3 conditions.

Ruling on Idaho Power's Motion to Strike Portions of Ms. Gilbert's Response Brief on Issue HCA-3:

In its motion, Idaho Power moves to strike, or in the alternative requests that no weight be given to, statements and arguments in Ms. Gilbert's Response Brief on Issue HCA-3 that

¹⁵⁰ Pursuant to OAR 345-015-0085(1), "parties shall submit proposed site certificate conditions to the hearing officer in writing according to a schedule set by the hearing officer." In this matter, the deadline for submitting written direct testimony, evidence, and any proposed site certificate conditions was September 17, 2021. *Case Management Order* at 16, 18.

¹⁵¹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 439 of 10016.

¹⁵² *See Ranzetta Rebuttal Test.* at 79-81.

reference compliance with the Protected Areas standard and the Land Use Standard. Idaho Power argues that these standards and Ms. Gilbert's statements related thereto, are outside the scope of Issue HCA-3, which is limited to whether the EFSC HPMP complies with the HCA standard. Motion at 5-7.

In her response brief, Ms. Gilbert references the Protected Areas standard and the Land Use standard in arguing that the project will have a significant adverse impact on Oregon Historic Trail resources. Gilbert Response on Issue HCA-3 at 3-7. The ALJ agrees that Ms. Gilbert's references to/and reliance upon these other standards are misplaced in the context of Issue HCA-3. Accordingly, the ALJ grants Idaho Power's request and gives these statements no weight.

Issue HCA-4: Whether National Historical Oregon Trail segments with ruts located on Mr. Horst's property (Hawthorne Drive, La Grande) can be adequately protected from adverse impacts from proposed facility.

Limited parties Horst and Cavinato have standing on Issue HCA-4. They argue that the segment of the Oregon Trail that runs across the Horst property is listed on the National Registry, that there are visible ruts alongside the private access portion of Hawthorne Drive, and that Idaho Power has not properly identified these ruts in the ASC. They also argue that the construction and operation of the proposed facility will adversely impact their property and quality of life and that monetary compensation will not compensate for their loss of peace and tranquility. Horst Closing Brief at 8, 12.

Limited parties Horst and Cavinato have not presented persuasive evidence to support their claim. Rather, the contested case record establishes that Idaho Power can adequately protect the NHT segments with ruts located on the Horst property from any adverse impacts from the proposed facility.¹⁵³ First, Recommended HCA Condition 1 requires Idaho Power to design and locate facility components to avoid direct impacts to Oregon Trail/NHT resources, including trail ruts, regardless of where the resources are located.¹⁵⁴ Consequently, if Idaho Power opts for the Mill Creek Route as the final route, and if NHT ruts are identified in the Direct Analysis Area, then the Company will avoid direct impacts to these resources by micrositing portions of the project or using other measures to protect the ruts from degradation.

Second, as discussed previously, Recommended HCA Condition 2 requires Idaho Power to submit a final EFSC HPMP that will be updated based on the outcome of the Section 106 review with site-specific mitigation identified based on final design and location of the project

¹⁵³ Idaho Power did not identify the Oregon Trail segments located on the Horst property in its initial analysis because these resources lie outside the Direct Analysis Area and Idaho Power did not have access to the property to perform surveys to assess impacts. When Idaho Power obtains permission to survey the property, the Company, in consultation with the Department and the Oregon SHPO, will evaluate the segments and develop measures to avoid, minimize, or mitigate impacts consistent with the PA and the EFSC HPMP. Ranzetta Rebuttal Test. at 83.

¹⁵⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 474 of 10016.

and the final impact assessments. Therefore, Idaho Power would minimize and mitigate indirect impacts to NHT ruts on the Horst property in accordance with HCA Condition 2 and the EFSC HPMP.

Accordingly, a preponderance of the evidence establishes that Idaho Power can protect Oregon Trail segments with ruts located on Mr. Horst's property. The limited parties have not shown otherwise.

Issue HCA-6: Whether, as part of the [EFSC] HPMP Applicant should be required to have an Oregon Trail expert, recommended by OCTA and agreed to by the Field Director, added to the Cultural Resource Team and present during preconstruction surveys to adequately identify emigrant trail locations.

Limited party Stacia Webster has standing on Issue HCA-6, and bears the burden of producing evidence to support her claim. Ms. Webster did not file any written direct testimony or exhibits in support of her position on Issue HCA-6 nor did she submit written closing argument regarding this issue. Because Ms. Webster failed to submit evidence and/or argument in support of her contention, the claim is unsubstantiated.¹⁵⁵ The findings in the Proposed Order constitute prima facie evidence of Idaho Power's compliance with the HCA standard.

Archaeological resource Site 6B2H-MC-10 – Issue HCA-7

Issue HCA-7: Whether Idaho Power adequately evaluated historic and archaeological resource "Site 6B2H-MC-10" on Mr. Williams' property, Parcel 03S37E01300.

Limited party Williams has standing on Issue HCA-7. As set out in the findings above, Proposed Order, Section IV.K.1.3, Table HCA-7 lists Site 6B2H-MC-10 on Mr. Williams' property as a potentially impacted historic property or archaeological site on private land. The Proposed Order describes the resource as unevaluated hunting blind within the Visual Assessment Analysis Area along the Morgan Lake Alternative Route.¹⁵⁶ Mr. Williams argues that Idaho Power has not completely surveyed his property and that the Council should not approve a site certificate until the Company has properly evaluated and documented resources on his property in accordance with the requirements of OAR 345-022-0090. Williams Closing Argument at 1. In his direct testimony, Mr. Williams asserted that his property (including Site 6B2H-MC-10) is listed on the NRHP. Mr. Williams also asserted that an archaeologist located a rock alignment and two lithic scatters in or near the Direct Analysis Area, which were not addressed in Tetra Tech's Summary of Surveys. Williams Direct Test. at 1-3.

First, to the extent that Mr. Williams asserts Idaho Power failed to address archaeological resources on his property other than Site 6B2H-MC-10, these claims fall outside the scope of

¹⁵⁵ Because Issue HCA-6 is unsubstantiated, there is no need to address the merits of the claim in this order. See *Ruling on Motion to Dismiss* at 8.

¹⁵⁶ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 499 of 10016.

Issue HCA-7.¹⁵⁷ Issue HCA-7 is limited to the adequacy of Idaho Power's evaluation of Site 6B2H-MC-10.¹⁵⁸

Second, and contrary to Mr. Williams' contention, Site 6B2H-MC-10 is not listed on the NRHP. In 2021, the Oregon Trail La Grande to Hilgard Segment was listed on the NRHP, but there is no evidence that Site 6B2H-MC-10, a hunting blind, was included in that listing. Third, Idaho Power has yet to evaluate Site 6B2H-MC-10 because the site is not located within the Direct Analysis Area. Rather, Site 6B2H-MC-10 is located just south of the Direct Analysis Area's southern boundary, within the Visual Assessment Analysis Area.¹⁵⁹ As explained previously, Idaho Power will evaluate indirect impacts cultural resources during Phase 2 of its VAHP Study Plan, in accordance with the Department's recommendations in the Proposed Order and the EFSC HPMP, and consistent with the processes contained in the PA.¹⁶⁰ Also as previously stated, the Council's standards do not require Idaho Power to complete its visual assessments and the Enhanced Archaeological Survey prior to issuance of the site certificate. The EFSC HPMP will be finalized and approved by the Department prior to construction of the facility. Idaho Power will complete Phase 2 of the archeological survey after the site certificate is issued, but prior to construction on the selected route, when site access has been secured for all properties.¹⁶¹

In short, the preponderance of the evidence establishes that Idaho Power adequately evaluated Site 6B2H-Mc-10 consistent with the Council's HCA standard. Mr. Williams has not shown to the contrary.

Proposed site certificate conditions related to Issue HCA-7:

In his Closing Argument, Mr. Williams also proposed site certificate conditions related to his property and the contents of the finalized EFSC HPMP.¹⁶² Mr. Williams proposed condition (1-4 and 6-10), as provided in the footnote below, contain provisions that the Department included in recommended HCA Condition 2 of the Draft Proposed Order, but removed in the Proposed Order as the language was redundant, yet not inclusive of all, requirements included in the HPMP. The Council finds the reintroducing requirements under the HPMP into the condition is unnecessary, as the condition requires that the plan be implemented, and the plan requires that 1-4 and 6-10 of Mr. Williams proposal be completed. Mr. Williams proposed condition (5) would require that Idaho Power complete an evaluation of resources on his property under ORS 385.905(1)(a) and ORS 358.905(1)(c). Similarly, this review would occur for all historic, cultural and archeological resources with a potential for direct or indirect impacts from construction or operation of the proposed. Council refrains from including a condition provision applicable to one sole property owner where the evaluation sought applies to all applicable resources. Council finds that the HPMP and HCA Condition 2, as amended in this order, are sufficient to ensure that resources are identified and evaluated; that direct and indirect impacts are assessed; and that mitigation will be identified, implemented and monitored, as applicable. Mr. Webster's proposed condition is therefore rejected.

¹⁵⁷ See *Rulings on Idaho Power Company's Objections to Limited Parties' Surrebuttal Testimony and Exhibits*, issued January 3, 2022, at 5.

¹⁵⁸ *Id.*; *see also Amended Order on Party Status* at 74, 79.

¹⁵⁹ Ranzetta Rebuttal Test. at 85-86.

¹⁶⁰ Ranzetta Rebuttal Test. at 86; *see also Proposed Order, Table HCA-7: Potentially Impacted Resources* under OAR 345-022-0090(1)(a), at 492 n. 498, ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 499 of 10016.

¹⁶¹ Ranzetta Rebuttal Test.; *see also ODOE - B2HAPDoc2 Proposed Order on ASC and Attachments* 2019-07-02, page 445-46 of 10016.

¹⁶² *See Williams Closing Argument* at 2. Mr. Webster's proposed condition is as follows:
The final HPMP shall include:

1. A revised High Probability Areas Assessment and revised inadvertent Discovery Plan;
2. Updated information to reflect process updates described in the Final Order of the ASC with respect to EFSC historic, cultural, and archaeological resource information to align with the Section 106 federal review;
3. Final eligibility determinations for newly identified resources and previously inventoried resources, with supporting documentation (final Cultural Resources Technical Report, ILS, RLS), from the lead federal agencies;
4. Based on the final eligibility determinations, identify which resources qualify for protections under OAR 345-022-0090(1)(a) through (c);
5. Applicant recommendations and supporting documentation to demonstrate if the resource on Mr. Williams' property qualifies as an archaeological object or site under ORS 358.905(1)(a) and ORS 358.905(1)(c).
6. A proposed site specific impact assessment including avoidance, minimization and/or mitigation measures for the resource.
7. Final site specific impact (direct and indirect) avoidance measures and an impact assessment for a phase or segment of the facility, or specific facility component, including avoidance measures in Historic, Cultural, and Archaeological Resources Condition 1;
8. Final site specific impact (direct and indirect) minimization measures based on final design of a phase or segment of the facility, or specific facility component;
9. Final site specific impact (direct and indirect) mitigation measures based on final design of a phase or segment of the facility, or specific facility component;
10. The certificate holder shall conduct all construction activities in compliance with the final Department-approved HPMP.

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Land Use Standard

As pertinent here, ORS 469.503 states as follows:

In order to issue a site certificate, the Energy Facility Siting Council shall determine that the preponderance of the evidence on the record supports the following conclusions:

* * * * *

(4) The facility complies with the statewide planning goals adopted by the Land Conservation and Development Commission.

Additionally, the Land Use standard, OAR 345-022-0030 provides, in pertinent part:

(1) To issue a site certificate, the Council must find that the proposed facility complies with the statewide planning goals adopted by the Land Conservation and Development Commission.

(2) The Council shall find that a proposed facility complies with section (1) if:

(a) The applicant elects to obtain local land use approvals under ORS 469.504(1)(a) and the Council finds that the facility has received local land use approval under the acknowledged comprehensive plan and land use regulations of the affected local government; or

(b) The applicant elects to obtain a Council determination under ORS 469.504(1)(b) and the Council determines that:

(A) The proposed facility complies with applicable substantive criteria as described in section (3) and the facility complies with any Land Conservation and Development Commission administrative rules and goals and any land use statutes directly applicable to the facility under ORS 197.646(3)[.]

* * * * *

(3) As used in this rule, the “applicable substantive criteria” are criteria from the affected local government's acknowledged comprehensive plan and land use ordinances that are required by the statewide planning goals and that are in effect on the date the applicant submits the application. * * *.

¹⁶³ As noted previously, the deadline for submitting written direct testimony, evidence, and any proposed site certificate conditions was September 17, 2021. *Case Management Order* at 16, 18.

GPS irrigation systems – Issue LU-4

Issue LU-4: Adequacy of the analysis of potential impacts of transmission line interference with GPS units on irrigation system.

Limited parties Jim and Kaye Foss have standing on Issue LU-4, and bear the burden of producing evidence to support their claim. The Fosses did not file any written direct testimony or exhibits in support of their position on Issue LU-4 nor did they submit written closing argument regarding Issue LU-4. Because the Fosses failed to submit evidence and/or argument in support of their contention that operation of the proposed transmission line would interfere with the GPS navigated irrigation system on their property, the ALJ considers their claim unsubstantiated.¹⁶⁴ The findings in the Proposed Order constitute *prima facie* evidence of Idaho Power's compliance with the Land Use standard.

Forest management practices – Issues LU-7 and LU-8

Issue LU-7: Whether the evaluation of the proposed facility impacts to the cost of forest practices accurately determined the total acres of lost production or indirect costs.

Issue LU-8: The adequacy of Applicant's evaluation of the proposed facility impacts to the cost of forest management practices and whether mitigation must be provided for the entire length of the transmission line for the operational lifetime.

Ms. Gilbert has standing on Issues LU-7 and LU-8. Ms. Gilbert did not timely submit any direct testimony, exhibits, or proposed site certificate conditions in support of her contentions on Issues LU-7 or LU-8.¹⁶⁵ However, she submitted a written closing brief combining her arguments on these two issues. In her Closing Brief on Issues LU-7 and LU-8, Ms. Gilbert argues that Idaho Power did not properly identify forestlands in Union County in accordance with Statewide Planning Goal 4 and did not properly calculate the potential impacts to the costs of accepted forest practices.¹⁶⁶ More specifically, Ms. Gilbert asserts that Idaho Power erred in applying the substantive criteria from the UCZPSO because Union County's ordinance does not comply with state law. Gilbert Closing Brief at 7, 17, 23-26. She further

¹⁶⁴ Where, as with Issue LU-4, the claim is deemed unsubstantiated, there is no need to address the merits of the claim in this order. *See Ruling on Motion to Dismiss* at 9.

¹⁶⁵ *See Ruling on Motion to Dismiss* at 9-11.

¹⁶⁶ Ms. Gilbert raises essentially the same contentions with Issues LU-7 and LU-8 that she raised in opposing Idaho Power's Motion for Summary Determination regarding Issue LU-5. *See Ruling on Issues LU-2, LU-3, LU-5 and LU-6* at 19-23. Issue LU-5 asked "whether calculation of forest lands must be based on soil class or whether it is sufficient to consider acreage where forest is predominant use." *Id.* at 2. In ruling in Idaho Power's favor as a matter of law, the ALJ found that Idaho Power properly used SSURGO soil classification data in determining the prominent use of hybrid-zoned land in Union County. *Id.* at 8, 22-23.

contends that land with a timber capability rating of 20 cubic foot per acre per year (cf/ac/yr) must be considered forestland and that Idaho Power must use the same soil capacity standard when determining prominent use and differentiating between farmland and forestland in Union County.¹⁶⁷ *Id.* at 9, 25, 29. As discussed below, Ms. Gilbert's arguments are without merit.

As set out above, to issue a site certificate, the Council must find that the proposed facility complies with the statewide land use planning goals adopted by the Land Conservation and Development Commission. Statewide Planning Goal 3, pertaining to agricultural lands, states that "agricultural lands shall be preserved and maintained for farm use * * *." OAR 660-015-0000(3). Statewide Planning Goal 4, pertaining to forestlands, states as follows:

To conserve forest lands by maintaining the forest land base and to protect the state's forest economy by making possible economically efficient forest practices that assure the continuous growing and harvesting of forest tree species as the leading use on forest land consistent with sound management of soil, air, water, and fish and wildlife resources and to provide for recreational opportunities and agriculture.

OAR 660-015-0000(4).

To implement Goal 4, the Land Conservation and Development Commission (LCDC) adopted administrative rules, found in OAR chapter 660, division 6. OAR 660-006-0000 sets out the requirements for governing bodies to accomplish the purpose of conserving forestlands. Local governments must (a) designate forestlands on the comprehensive plan map consistent with Goal 4 and OAR chapter 660, division 6; (b) zone forestlands for uses allowed pursuant to OAR chapter 660, division 6; and (c) adopt plan policies consistent with OAR chapter 660, division 6. For purposes of Goal 4, and as relevant here, "forest lands" means "those lands acknowledged as forest lands." OAR 660-006-0005(7). OAR 660-006-0015 requires that lands inventoried as forestlands be designated in the comprehensive plan and implemented with a zone that conserves forestlands consistent with OAR chapter 660, division 6, unless an exception to Goal 4 applies.

OAR 660-006-0025 sets out uses authorized in forest zones. OAR 660-006-0050 authorizes a governing body to establish hybrid agriculture/forest zones with the same authorized uses. As pertinent here, "new electric transmission lines" may be authorized on forestlands,¹⁶⁸ subject to the following review standards:

¹⁶⁷ Ms. Gilbert also includes in her Closing Brief on Issues LU-7 and LU-8 arguments that are outside the scope of either issue, such as challenges to the draft Fish and Wildlife Mitigation plan and the draft Noxious Weed Plan. Because these arguments are outside the scope of Issue LU-7 or LU-8, the ALJ declines to address them in this context.

¹⁶⁸ OAR 660-015-0025(4)(q) states:

The following uses may be allowed on forest lands subject to the review standards in section (5) of this rule:

* * * * *

- (a) The proposed use will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands; [and]
- (b) The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel[.]

OAR 660-006-0025(5).

As discussed in the findings, the UCZPSO includes a hybrid farm-forest zone, the Timber-Grazing zone, as authorized by OAR 660-006-0050. UCZPSO 5.02 addresses permitted uses in the Timber-Grazing zone. UCZPSO 5.04 sets out the authorized conditional uses in the Timber-Grazing zone and the general review criteria. UCZPSO 5.04 mirrors the language in OAR 660-006-0025(4)(q) by authorizing “new electric transmission lines” as a conditional use in the Timber-Grazing zone. UCZPSO 5.04.21. Similarly, UCZPSO 5.06 mirrors the language in OAR 660-006-0025(5) in setting out the conditional use review criteria:

A use authorized by Section 5.04 of this zone may be allowed provided the following requirements or their equivalent are met. These requirements are designed to make the use compatible with forest operations and agriculture and to conserve values found on forest lands.

1. The proposed use will not force a significant change in, or significantly increase the cost of, accepted farming or forest practices on agriculture or forest lands.
2. The proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel.

UCZPSO 5.06.

In preparing ASC Exhibit K, Idaho Power worked closely with Union County planning staff to analyze the predominant use on each of the 61 parcels within the project site boundary located wholly or partially in the Timber-Grazing Zone. In accordance with UCZPSO requirements, Idaho Power determined the predominant use of the hybrid-zoned parcels by using soil maps and SSURGO data to determine soil designations and capabilities where such data was available. Where such data was not available to evaluate the predominant use, Idaho Power conservatively classified the land as forestland.¹⁶⁹ Idaho Power determined that for the Proposed

(q) New electric transmission lines with right of way widths of up to 100 feet as specified in ORS 772.210. New distribution lines (e.g., gas, oil, geothermal, telephone, fiber optic cable) with rights-of-way 50 feet or less in width[.]

ORS 772.210, in turn, authorizes a public utility to enter and condemn lands for construction of service facilities.

¹⁶⁹ ODOE - B2HAPPDoc3-19 ASC 11_Exhibit K_Land Use_ASC 2018-09-28, page 239 of 614.

Route, approximately 53 percent of Timber-Grazing zoned land has a predominant use of rangeland and about 47 percent had a predominant use of forestland. For the Morgan Lake Alternative Route, Idaho Power determined that about 60 percent had a predominant use of rangeland and about 40 percent was classified as forestland.¹⁷⁰

Contrary to Ms. Gilbert's contentions, Idaho Power did not err in applying the UCZPSO to identify the amount of forestland in Union County potentially impacted by the proposed facility. Furthermore, Ms. Gilbert has not established that Union County's zoning ordinance is contrary to state law, as there is no state law provision requiring that all land parcels consisting of soils capable of producing 20 cf/ac/year of timber be classified as forestland when determining prominent use and differentiating between farmland and forestland.

Ms. Gilbert cites to OAR 660-033-0130(4)(c)(B)(iii)¹⁷¹ in support of her contention that soils with a capacity to produce as little as 20 cf/ac/yr must be classified as forestland. However, this rule, found in Chapter 660, Division 33 (Agricultural Land) is not applicable to the Goal 4 analysis, and does not govern the predominant use analysis for the Timber-Grazing zone in Union County.

Ms. Gilbert also sites to several LUBA decisions to support her argument, but these decisions also fail to demonstrate that Idaho Power erred in determining the predominant use of hybrid-zoned land in Union County. The LUBA cases referenced in Ms. Gilbert's brief address the classification of land based on soils data in the context of a land use plan amendment. The cases apply OAR 660-006-0010(2) to discuss the process of identifying Goal 4 forestland, but the rule's provisions relevant to identifying "lands suitable for commercial uses" only apply "where a plan amendment is proposed."¹⁷² The matter at hand is the Council's evaluation of

¹⁷⁰ *Id.*

¹⁷¹ OAR 660-033-0130(4)(c)(B)(iii), pertains to approval of a *single family residential dwelling* on land zoned for *agricultural use* not provided in conjunction with farm use in counties outside the Willamette Valley. The provision states, in part, as follows:

If the parcel is under forest assessment, the dwelling shall be situated upon generally unsuitable land for the production of merchantable tree species recognized by the Forest Practices Rules * * *. If a lot or parcel is under forest assessment, it is presumed suitable if, in Western Oregon, it is composed predominantly of soils capable of producing 50 cubic feet of wood fiber per acre per year, or in Eastern Oregon it is composed predominantly of soils capable of producing 20 cubic feet of wood fiber per acre per year. If a lot or parcel is under forest assessment, to be found compatible and not seriously interfere with forest uses on surrounding land it must not force a significant change in forest practices or significantly increase the cost of those practices on the surrounding land[.]

¹⁷² OAR 660-006-0010, titled Identifying Forest Land, states in pertinent part:

(1) Governing bodies shall identify "forest lands" as defined by Goal 4 in the comprehensive plan. Lands inventoried as Goal 3 agricultural lands, lands for which an

compliance with Goal 4 for purposes of siting an energy facility, not a plan amendment application. Furthermore, even if these LUBA decisions were relevant to determining the predominant use of parcels in Union County's hybrid farm-forest zone, the cases do not establish, as a matter of law, a bright line threshold for the level of cf/ac/yr productivity that qualifies land as forestland.

Third, and most importantly, even if Idaho Power did understate the amount of Goal 4 forestland in Union County potentially impacted by the proposed facility, the fact remains that the calculation of impacted forestland in Union County is not pertinent to the evaluation of whether the proposed facility complies with Goal 4. For purposes of the Council's review, the relevant inquiry is whether the proposed facility (an authorized use in forest lands under OAR 660-006-0025(4)(q)) satisfies the review standards set out in OAR 660-006-0025(5) (*i.e.*, whether the proposed use will force a significant change or significantly increase the cost of accepted farming or forest practices or significantly increase the risk of fire). The conditional use review criteria in Union County (UCZPSO 5.04) are the same as those set out in OAR 660-006-0025(5). Therefore, any purported error related to identifying forestland in Union County would not substantively affect the analysis of whether the proposed transmission line satisfies the conditions to be sited in Goal 4 forestlands.

Finally, to the extent Ms. Gilbert asserts that the proposed facility will significantly increase the cost of accepted farming or forest practices on Goal 4 forestlands, she has not provided any evidence to support this contention. The Department found that the proposed facility satisfies the conditional use criteria of OAR 660-006-0025(5)(a) and Ms. Gilbert has not shown otherwise. Nor has Ms. Gilbert demonstrated the need for Idaho Power to implement all planned mitigation measures for the operational lifetime of the project. Indeed, there is no reason to require Idaho Power to continue implementing mitigation measures during operations that are specific to the construction phase, and no need to require forest impact mitigation measures along the entire transmission line, when the line only crosses forestlands in two

exception to Goal 4 is justified pursuant to ORS 197.732 and taken, and lands inside urban growth boundaries are not required to be planned and zoned as forest lands.

(2) *Where a plan amendment is proposed:*

(a) Lands suitable for commercial forest uses shall be identified using a mapping of average annual wood production capability by cubic foot per acre (cf/ac) as reported by the USDA Natural Resources Conservation Service. Where NRCS data are not available or are shown to be inaccurate, other site productivity data may be used to identify forest land, in the following order of priority:

(A) Oregon Department of Revenue western Oregon site class maps;

(B) USDA Forest Service plant association guides; or

(C) Other information determined by the State Forester to be of comparable quality.

Emphasis added.

counties, Umatilla and Union.

To summarize, with regard to Issue LU-7, a preponderance of evidence in the record demonstrates that Idaho Power accurately identified the amount of forest land impacted by the proposed facility in Union County, and accurately estimated the total acres of lost production and indirect costs. Ms. Gilbert has not shown otherwise. With regard to Issue LU-8, the preponderance of the evidence establishes that Idaho Power adequately evaluated the proposed facility's impacts on the cost of forest management practices. The proposed measures to mitigate impacts on forested areas are adequate and appropriate, and Ms. Gilbert has not presented any evidence to demonstrate otherwise.

Proposed site certificate conditions related to Issues LU-7 and LU-8:

In her Closing Brief on Issues LU-7 and LU-8, Ms. Gilbert proposed, for the first time in this contested case, 10 new site certificate conditions related to forestland in Union County.¹⁷³ Idaho Power opposes the conditions (Idaho Power's Response Brief and Motion to Strike for LU-4, LU-7, LU-8, LU-9, and LU-11, p. 93-98) as unnecessary and inappropriate and Council agrees. Ms. Gilbert's proposed conditions, as included in footnotes below, are not consistent with the findings of fact, conclusions of law and opinion provided in this order for Issues LU-7 and LU-8, and would require analysis and reassessment of impacts within farm-forest hybrid zoned land based on the presumption that Ms. Gilbert prevailed on the issue. The Council adopts the ALJ's findings of fact, conclusions of law and opinion on Issues LU-7 and LU-8 and therefore rejects conditions that would only apply if Council were to have found that the ALJ's findings of fact, conclusions of law and opinion on those issues were in error.

¹⁷³ Ms. Gilbert proposed the following site certificate conditions in her Closing Brief:

Unnumbered Gilbert Proposed Condition: Prior to the start of construction in Union and Umatilla Counties, the developer must provide documentation that mitigation was provided to forest landowners to compensate for the loss of timber production for the life of the development. This amount was calculated by the department to be approximately \$40,100 per acre of impact for forested land in Union County and \$24,600 per acre of impact for forest land in Umatilla County. This amount is in addition to the negotiations for an easement for the transmission line and associated roads.

Gilbert Proposed Forestland Condition 1: Prior to the start of construction in Union County the developer must provide documentation regarding the soil types and capacity amounts used to determine whether parcels of land being crossed was "forest land."

Gilbert Proposed Forestland Condition 2: Charts showing the amount of land in each category based upon the soil type and mitigation required for habitat impacts must be updated.

Gilbert Proposed Forestland Condition 3: The council must determine if the development complies with the Land Use Goal 4 based upon the increased amount of forest land being impacted.

Gilbert Proposed Forestland Condition 4: The forest practices plan must be updated and

other rules that are impacted by the change in forest land being crossed.

Gilbert Additional Proposed Forestland Condition 1: Documentation in the file showing 18.3 acres of permanent impacts to forest land on the Morgan Lake Route and documentation in the "Plan for Alternate Practice" showing that 296.8 acres of forest land will be cleared. At a minimum, the mitigation needs to include the acres of trees being cleared for the duration of the project. * * * This amount plus any additional forest land not previously identified must be mitigated.

Ruling on Idaho Power's Motion to Strike Portions of Ms. Gilbert's Closing Brief on Issues LU-7 and LU-8:

In its Response Brief, Idaho Power moves to strike or, in the alternative, give no weight to certain statements in Ms. Gilbert's Closing Brief on Issues LU-7 and LU-8. Specifically, Idaho Power challenges statements that address an issue for which Ms. Gilbert does not have limited party status, statements that seek to relitigate matters already resolved on summary determination, and/or statements that reference or rely on the Hartell deposition transcript and exhibits. Idaho Power Motion to Strike, Issues LU-7 and LU-8 at 7-13.

As discussed in the Evidentiary Rulings section above, the ALJ declined to reopen the evidentiary record to admit certain documents, including the Hartell deposition transcript, that Ms. Gilbert did not timely offer in support of her position(s) on Issues LU-7, LU-8 and LU-11. The ALJ noted that Ms. Gilbert submitted the Hartell deposition transcript in support of her opposition to Idaho Power's Motion for Summary Determination on Issues LU-2, LU-3, LU-5, LU-6, but she did not offer it as evidence during the hearing testimony phase.

Because Ms. Gilbert did not timely offer the Hartell deposition transcript (or the exhibits referenced in the transcript) in connection with Issues LU-7, LU-8 or LU-11, she is not entitled to rely upon this evidence in her Closing Brief. Furthermore, as discussed previously, based on the *Ruling on Motion to Dismiss*, Ms. Gilbert is limited in her closing arguments on Issues LU-7 and LU-8 to referencing evidence previously admitted into the evidentiary record as part of the B2H Project Record. For these reasons, the ALJ grants Idaho Power's alternate request and gives no evidentiary weight to Ms. Gilbert's discussion of the Hartell deposition in her Closing

Gilbert Additional Proposed Forestland Condition 2: The evaluation of impacts causing increased costs or requirements to change procedures in forest lands must be corrected to address the additional forest land impacted.

Gilbert Additional Proposed Forestland Condition 3: Amounts identified as needed to provide mitigation for habitat impacts to forest land must be updated to reflect new information.

Gilbert Additional Proposed Forestland Condition 4: Updated financial impacts of development must have objective mitigation required to compensate landowners for the impacts.

Gilbert Additional Proposed Forestland Condition 5: No credit for mitigation can be allowed for actions that are not required and identified in the Site Certificate including payments to landowners resulting from right of way compensation.

Gilbert Closing Brief Issues LU-7 and LU-8 at 4, 9-11, and 34.

Brief.¹⁷⁴ The ALJ also gives no weight to arguments in the Closing Brief outside the scope of Issues LU-7 and LU-8 (such as challenges to the Fish and Wildlife Habitat Mitigation Plan and the Noxious Weed Plan and comments on the alleged unmitigated costs of the proposed facility to be assumed by the landowner).

Accepted farm practices – Issues LU-11 and LU-9

Issue LU-11: Whether the impacts from the proposed facility on accepted farm practices and the cost of accepted farm practices have been adequately evaluated or mitigated.

Ms. Gilbert also has standing on Issue LU-11. Ms. Gilbert challenges, on multiple grounds, the Proposed Order's analysis of potential impacts to farm practices. Ms. Gilbert asserts that the Proposed Order and Site Certificate fail to comply with ORS 215.275(4) and (5) and fail to protect agricultural lands and landowners from adverse impacts.

ORS 215.275 addresses the siting of utility facilities in exclusive farm use-zoned lands. As pertinent here, the statute provides:

(4) The owner of a utility facility approved under ORS 215.213 (1)(c)(A) or 215.283 (1)(c)(A) shall be responsible for restoring, as nearly as possible, to its former condition any agricultural land and associated improvements that are damaged or otherwise disturbed by the siting, maintenance, repair or reconstruction of the facility. Nothing in this section shall prevent the owner of the utility facility from requiring a bond or other security from a contractor or otherwise imposing on a contractor the responsibility for restoration.

(5) The governing body of the county or its designee shall impose clear and objective conditions on an application for utility facility siting under ORS 215.213 (1)(c)(A) or 215.283 (1)(c)(A) to mitigate and minimize the impacts of the proposed facility, if any, on surrounding lands devoted to farm use in order to prevent a significant change in accepted farm practices or a significant increase in the cost of farm practices on the surrounding farmlands.

¹⁷⁴ In the Motion to Strike, Issues LU-7 and LU-8, Idaho Power also asked that, even if the challenged portions of Ms. Gilbert's Closing Brief are not considered, the ALJ review the Hartell deposition transcript to assess whether consideration of the excluded document would have altered the determination on Issues LU-7 and LU-8. Motion to Strike, Issues LU-7 and LU-8 at 9. In accordance with Idaho Power's request, the ALJ has reviewed the Hartell deposition transcript (as offered in by Ms. Gilbert on June 25, 2021 in opposition to Idaho Power's Motion for Summary Determination on Issue LU-5, without deposition exhibits attached). In the deposition, Mr. Hartell explained Union County's process for determining predominant use of land parcels and identifying forest land in the Timber-Grazing zone. He also explained that Union County's review of Idaho Power's predominant use analysis did not result in any adjustments to the predominant use value that Idaho Power initially assigned to parcels in the Timber-Grazing zone. The ALJ confirms that nothing in the Hartell deposition transcript would change her conclusions and determinations on Issues LU-7 and LU-8.

In essence, this zoning law makes the utility owner responsible for restoring, as nearly as possible, disruptions to farmland caused by the construction and operation of the facility, and requires the governing body to impose clear and objective conditions on the construction and operation of the facility to mitigate and minimize any impacts on surrounding farmland.

With regard to compliance with ORS 215.275(4), Ms. Gilbert contends that the Proposed Order fails to adequately address the proposed facility's impacts on agricultural landowners and the costs of restoring the land to allow for farming, should the facility be retired or abandoned. Gilbert Opening Arguments Issue LU-11 at 5-6; Gilbert Closing Brief Issue LU-11 at 1-3, 8-10. On the one hand, Ms. Gilbert misreads ORS 215.275(4) and conflates it with OAR 345-022-0050, the Retirement and Financial Assurance standard. The zoning law requires the facility owner to restore agricultural land damaged or disturbed by the "siting, maintenance, repair or reconstruction of the facility," whereas the Council standard requires a finding that, upon retirement, the applicant is able to obtain a bond or letter of credit in an amount sufficient to restore the site to a "useful, non-hazardous condition." Insofar as Ms. Gilbert challenges the sufficiency of Idaho Power's retirement under ORS 215.275(4), her argument is misplaced.¹⁷⁵

On the other hand, and contrary to Ms. Gilbert's contention, the Proposed Order includes a site certificate condition addressing Idaho Power's compliance with ORS 215.275(4). As set out in the findings above, Recommended Land Use Condition 14 requires Idaho Power to implement the Agricultural Lands Assessment. The Agricultural Lands Assessment, in turn, requires the Company to restore, as nearly as possible, any impacted farmlands to former productivity.¹⁷⁶ The obligations in Recommended Land Use Condition 14 and the Agricultural Lands Assessment will ensure that Idaho Power will restore productivity, as nearly as possible, to any impacted farmlands as required by ORS 215.275(4).

With regard to ORS 215.275(5), Ms. Gilbert asserts that the various mitigation plans set out in the Proposed Order, including the Agricultural Lands Assessment and Agricultural Mitigation Plan, the Noxious Weed Plan, and the Fire Prevention and Suppression Plan, do not contain clear and objective conditions that serve to mitigate and minimize the proposed facility's impacts on surrounding farmlands. She also contends that these plans do not contain enough detail to allow the public the right to participate in the process. Gilbert Opening Arguments Issue LU-11 at 3-4, 6-16; Gilbert Closing Brief Issue LU-11 at 7-8, 11-24.

Ms. Gilbert's concerns about the sufficiency of the Noxious Weed Plan are addressed above in connection with Issue FW-3. Ms. Gilbert's concerns about the sufficiency of the Fire Prevention and Suppression Plan appear to be outside the scope of Issue LU-11, but are nevertheless addressed *infra* in the context of Issues PS-4 and PS-10. Ms. Gilbert's concerns about the finalization of draft plans generally (and the lack of opportunity for public review and

¹⁷⁵ Ms. Gilbert's challenges to the adequacy of Idaho Power's bond/letter of credit are outside the scope of Issue LU-11. The argument is addressed *infra* in connection with Issue RFA-1.

¹⁷⁶ See Proposed Order, Attachment K-1 at 35 (Section 7.0, discussing the Agricultural Mitigation Plan and efforts to minimize impacts to agricultural lands); ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8916 of 10016.

comment) also appear to be outside the scope of Issue LU-11, but are nevertheless addressed elsewhere in this order.¹⁷⁷

Ms. Gilbert's specific challenges to the adequacy of the Agricultural Lands Assessment and the Agricultural Mitigation Plan incorporated therein are also without merit. As set out in the findings, the Agricultural Mitigation Plan (Section 7 of Attachment K-1) identifies the measures Idaho Power will take to avoid, mitigate repair and/or provide compensation for impacts that may result from the construction or operation of the proposed facility on privately owned agricultural land. The plan states that the Company "will reasonably restore the land to its former condition or compensate each landowner, as appropriate, for damages and/or impacts to agricultural operations caused as a result of Project construction and as outlined in this plan."¹⁷⁸ The plan identifies specific actions that Idaho Power take to minimize and mitigate impacts including but not limited to tower placement, weed control, replacement of topsoil and removal of rocks contained in any material brought to the construction area and scheduling construction activities to minimize impacts to livestock operations.¹⁷⁹ In the Proposed Order, the Department found that adherence with the plan and Recommended Land Use Condition 14 will restore agricultural land impacted by construction of the facility as nearly as possible to prior condition, as required by ORS 215.275(4), following clear and objective conditions to mitigate impacts to agricultural landowners as required by ORS 215.275(5).¹⁸⁰

In her Opening Arguments and Closing Brief, Ms. Gilbert identified a list of potential impacts to farm practices that she contends will result from the project,¹⁸¹ but she has not provided any evidence to support these assertions. In addition, she has failed to acknowledge the findings in the Proposed Order regarding the potential impacts to agricultural lands, the provisions of the Agricultural Lands Assessment, and/or the rebuttal testimony of Idaho Power's witness, Kurtis Funke, responding to each of her concerns.¹⁸²

Ms. Gilbert also challenged calculations set out in Attachment K1, Table 5-7, Site Boundary and Average Temporary/Permanent Disturbance Areas by Project Component, and asserted that Idaho Power failed to include all land that will subject to construction and permanent impacts. Gilbert Closing Brief at 32-34. Contrary to Ms. Gilbert's contentions, however, the preponderance of the evidence establishes that Idaho Power did not understate the amount of agricultural land in the project area. The preponderance of the evidence also establishes that Idaho Power appropriately included the features that would result in construction

¹⁷⁷ See the discussion of *Gould* under Issue HCA-3 *supra* and the discussion under Issue M-6 *infra*.

¹⁷⁸ ODOE – B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8918 of 10016.

¹⁷⁹ *Id.*, pages 8916 to 8924 of 10016.

¹⁸⁰ *Id.*, pages 23-32 of 10016.

¹⁸¹ See Gilbert Opening Arguments Issue LU-11 at 17-19; Gilbert Closing Brief Issue LU-11 at 27-38.

¹⁸² See Funke Rebuttal Test. at 46-66 (responding to each concern/allegation identified in Ms. Gilbert's Opening Arguments on Issue LU-11).

disturbance in Table 5-7.¹⁸³ To the extent Ms. Gilbert identified errors in the presentation of acres impacted for different structure types, Idaho Power prepared an updated Table 5-7 correcting these errors.¹⁸⁴

Moreover, even assuming that Idaho Power did err in its calculation of acreage of agricultural land permanently disturbed by the project the error would not alter the evaluation of under ORS 215.275(5). As the Department notes in its Closing Brief:

[A]s presented in the Proposed Order, the Department's evaluation of whether the proposed facility would significantly impact accepted farm practices or the cost thereof under ORS 215.275(5) is not based on acres of permanent impacts. Rather, the evaluation is based on the applicant's assessment of accepted farm practices within the area surrounding the site boundary; the applicant's assessment of potential impacts to those practices; and whether the applicant's proposed mitigation for those impacts would ensure that accepted farm practices are not significantly impacted. Therefore, correlating a factual discrepancy to the ORS 215.275 compliance evaluation ignores the substance of the evidence and information developed and relied upon for the ORS 315.275 evaluation.

ODOE Closing Brief at 75.

In short, the fact that the proposed facility will have construction-related and permanent impacts on privately owned agricultural lands does not mean the facility cannot satisfy the requirements of ORS 215.275. As the Oregon Supreme Court recognized in *Friends of Parrett Mountain v. NW. Nat. Gas Co.*, 336 Or 93, 115, (2003), the requirement in ORS 215.275(5) to mitigate and minimize a utility facility's impacts on agricultural land "requires the general reduction in the intensity and frequency of an impact, not * * * the absolute avoidance or elimination" of such impacts.

A preponderance of evidence in the record establishes that Idaho Power adequately assessed and mitigated potential impacts to accepted farm practices on surrounding farmlands consistent with ORS 215.275(5). The Company has demonstrated compliance with the Council's Land Use Standard as it relates to Issue LU-11. Ms. Gilbert has not shown otherwise.¹⁸⁵

¹⁸³ Funke Rebuttal Test. at 48-49.

¹⁸⁴ *Id.* at 49-50; Funke Rebuttal Exhibit C.

¹⁸⁵ As Idaho Power notes in its Closing Arguments and Response Brief, unsupported concerns about potential impacts to exclusive farm use-zoned lands cannot reasonably support a conclusion that a proposed facility will result in a significant change in accepted farm practices or a significant increase in the cost of farm practices. See *Falcon Heights. Water and Sewer Dist. v. Klamath County*, LUBA No. 2011-068 at 12-13 (Dec. 22, 2011), Attachment A to Idaho Power's Closing Arguments for Contested Case Issues LU-4, LU-7, LU-8, LU-9, and LU-11.

Proposed site certificate conditions related to Issue LU-11:

In her Opening Arguments on Issue LU-11, Ms. Gilbert proposed site certificate conditions related to monitoring and control of noxious weeds. Gilbert Opening Arguments at 13, 16. Those proposed conditions are addressed above in Issue FW-3.

In her Closing Brief on Issue LU-11, Ms. Gilbert restates the proposed noxious weed conditions and proposes additional conditions related to the finalization of draft mitigation plans and mitigation for impacts to agricultural lands.¹⁸⁶ Ms. Gilbert has not presented evidence to support the proposed additional conditions and based on the determination on Issue LU-11 above, they are unnecessary and inappropriate.

Issue LU-9: Whether Applicant adequately analyzed the risk of wildfires from operation of the proposed transmission lines, especially during “red flag” warning weather conditions and the impact the proposed transmission lines will have on Mr. Myers’ ability to use an aerial applicator on his farmland.

Limited party Sam Myers has standing on Issue LU-9 as a personal interest. In his submissions on this issue, Mr. Myers focused on the cost of farm practices related to wildfire risks and potential damage to soils caused by a catastrophic fire. Specifically, Mr. Myers asserts that Idaho Power’s draft Fire Prevention and Suppression Plan does not adequately address the risk of transmission line-related fires during Red Flag weather conditions and/or in extreme whirlwind events. He also contends that the Company lacks a mitigation plan to rehabilitate soils damaged in the event of a catastrophic fire. Myers Direct Test. at 1-5; Myers Closing Brief

¹⁸⁶ Ms. Gilbert proposed the following conditions for the first time in her Closing Brief on Issue LU-11:

1. Prior to the start of construction, all proposed final plans will be jointly developed with the impacted county staff. They will be provided [the] opportunity to make recommendations prior to the start of drafting and will be provided a justification if their recommendations are not implemented.
2. Prior to the start of construction, mitigation will be determined for impacts to agricultural landowners and a formal agreement signed to address issues of increased costs and mandatory changes in procedures as a result of the project.
3. Prior to the issuance of a site certificate the developer must establish the costs associated with the impacts the development will have on agricultural landowners, the procedural changes, and specify how those costs and changes will be mitigated for impacted farm owners.

Gilbert Closing Brief on Issue LU-11 at 26-28, 41.

at 1-12. In addition, in his Closing Brief, Mr. Myers questions the mitigation for any limitations that the proposed facility may have on his ability to use an aerial applicator on his farmland. Myers' Closing Brief at 13.

Red Flag Warnings and whirlwinds. Contrary to Mr. Myers' contentions, Idaho Power adequately analyzed the risk of project-related wildfire during Red Flag warning weather conditions. Although the proposed facility is not yet under construction, Idaho Power analyzed the potential fire risk zones along the proposed route in its 2022 Wildfire Mitigation Plan.¹⁸⁷ The Company's 2022 Wildfire Mitigation Plan specifically addresses Red Flag Warning concerns as a consideration in implementing the PSPS Plan.¹⁸⁸ The PSPS plan thoroughly addresses potential weather-related risks and details Idaho Power's plans for managing its operations to address those risks.¹⁸⁹

The evidence also demonstrates that the risk of a project-related fire is very low even during Red Flag Warning conditions and/or gusty wind conditions. As Idaho Power's expert witness Dr. Lautenberger explained, 500 kV transmission lines rarely ignite fires.¹⁹⁰ Moreover, occurrences of severe fire weather near the project site are less frequent than in places like Northern California, where the largest wildfires occurred. Offshore winds that drove many of the large-loss fires in California are not a concern in Eastern Oregon or Idaho.¹⁹¹ Therefore, even if Mr. Myers is correct that large dust devils occur in Morrow County, there is little risk they would interact with a transmission line to cause a fire. The distance between phases on the project's structures, the height of the structures and the soil type along the site boundary also decrease the likelihood that a dust devil would cause sparking and ignite a fire.¹⁹²

Fire impact on soils. Mr. Myers also raised the concern that a project-related catastrophic fire could cause significant damage to his soil. He asserts that Idaho Power should have "a plan in place for immediate soil rehabilitation and compensation." Myers Closing Brief at 12-13. As discussed above (and in more detail below in the context of Issues PS-4 and PS-10), the likelihood of a catastrophic project-related wildfire during operation is very low. Fires caused by 500kV transmission lines are exceedingly rare. Moreover, historically, wildfires in the area near Mr. Myers' agricultural operations have been relatively small and quickly contained. Given the improbability of a project-related wildfire disrupting Mr. Myers' agricultural operations, there is no need for Idaho Power have a soil rehabilitation plan in place for Mr. Myers' agricultural land.

¹⁸⁷ Dockter Sur-surrebuttal Test., Ex. B at 18-19.

¹⁸⁸ *Id.*, Ex. B at 76; Dockter Cross-Exam. Test., Tr. Day 3 at 22-23.

¹⁸⁹ Dockter Sur-surrebuttal, Ex. B at 65.

¹⁹⁰ Lautenberger Direct Test. at 46-54.

¹⁹¹ Lautenberger Rebuttal Test. at 53.

¹⁹² *Id.* at 55.

Furthermore, a preponderance of the evidence also demonstrates that, if a fire were to occur at or near Mr. Myers' agricultural operations, the fire would most likely result in minimal damage to soils. As Idaho Power's soil expert Mark Madison explained, the fuel source would be mostly herbaceous, grass and grain vegetation. The low-intensity fire would likely move quickly through the fields due to winds in that area, and low intensity, fast moving fires do not cause significant damage to soils.¹⁹³ Consequently, Mr. Myers' challenge to the proposed facility's compliance with the Land Use standard on this basis is unpersuasive.

Aerial application. Finally, Mr. Myers asserts that because the proposed transmission line limits landowners' ability to utilize aerial spraying, the facility violates the Land Use standard, and Idaho Power has yet to make any effort to compensate for this permanent impact to farming practices. Myers Closing Brief at 13-14. Contrary to Mr. Myers' contention, however, the Land Use standard does not require complete avoidance or the absence of impacts to accepted farm practices. Rather, as previously discussed, the applicable law simply requires a general reduction in the intensity and frequency of an impact.¹⁹⁴

In its Agricultural Lands Assessment, Idaho Power identified aerial agricultural operations as one of the accepted farm practices on surrounding farmlands that the project may impact. Idaho Power acknowledged that the presence of transmission lines prevents aerial access to crops directly beneath the lines, may potentially decrease crop yields, and may indirectly impede aerial application of chemicals to other portions of the field depending on orientation, wind direction, and other factors.¹⁹⁵ Idaho Power has committed to minimize potential impacts to aerial spraying by siting the transmission lines as much as possible along the edges of fields, existing roadways, or natural boundaries, rather than through existing fields, which will result in less risk to the applicator and more efficiency to the producer.¹⁹⁶ Through these actions, Idaho Power will reduce the intensity and frequency of impacts to farmlands, consistent with ORS 215.275(5).

As to Mr. Myers' farmland in particular, Idaho Power acknowledged that the proposed transmission line may impact Mr. Myers' ability to use aerial applications. As discussed above, the Company will attempt to reduce potential impacts to active agricultural fields through micrositing facility components.¹⁹⁷ Moreover, although such negotiations are outside the Council's site certificate approval process, the Company will work with the landowner(s) to negotiate an easement for the right-of-way, and will minimize impacts to the extent practicable.

In sum, although the proposed project may impact Mr. Myers' agricultural operations, a

¹⁹³ Madison Rebuttal Test. at 92; *See also* Madison Rebuttal Ex. M.

¹⁹⁴ ORS 215.275(5); *see also* *Friends of Parrett Mountain v. NW. Nat. Gas Co.*, 336 Or 93, 115, (2003).

¹⁹⁵ Proposed Order, Attachment K-1, ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 8904-05 of 10016.

¹⁹⁶ *Id.*

¹⁹⁷ *Id.* page 8906 of 10016.

preponderance of the evidence demonstrates that Idaho Power sited the project in a manner that will generally reduce the intensity and frequency of impacts to farmlands, and that the Company will further minimize and mitigate the specific impacts to Mr. Myers' operations when negotiating an easement with him. Idaho Power has shown that the project complies with the Land Use standard notwithstanding the impact the project may have on Mr. Myers' farm practices.

Proposed site certificate conditions related to Issue LU-9:

In his Closing Brief, Mr. Myers proposed several site certificate conditions that he asserts are necessary to ensure compliance with the Land Use standard.¹⁹⁸ Mr. Myers has not presented evidence to support the proposed conditions and, based on the determination on Issue LU-9 above, the proposed conditions are neither necessary nor appropriate.

Ruling Idaho Power's Motion to Strike Portions of Mr. Myers' Closing Brief, Issue LU-9:

In its Response Brief, Idaho Power moves to strike or, in the alternative, give no weight to certain statements in Mr. Myers' Closing Brief on Issue LU-9. Idaho Power challenges statements that seek to raise an issue for which Mr. Myers was not granted limited party status and/or that rely on evidence not admitted into in the record of the contested case. Specifically,

¹⁹⁸ Mr. Myers proposed the following conditions in his February 28, 2022 Closing Brief:

- Towers must be constructed to withstand 150+ mph maximum wind load speeds.
- Towers built to the 500 kV standards but only operated at 230 kV voltages.
- The entire transmission line must be powered down (turned off) at a minimum from June 15 – July 15 each year. This allows wheat harvesting (and other dryland cropping) to proceed throughout Morrow County without any possibility of electric discharge events from occurring.
- The entire transmission line must be powered down (turned off) during any Red Flag Warnings issued where B2H traverses.
- IPC must classify the ground covered by the transmission line within Morrow County as a high-risk zone in its site plan.
- IPC must compensate financially landowners/tenants for any land use restrictions (ie: harvesting, aerial spraying, cropping limitations, etc.) both during construction and operation before final project certification is issued.
- IPC must agree to \$1000 per/acre paid to landowners/tenants for soil rehabilitation costs resulting from transition line fires.

Myers Closing Brief Issue LU-9 at 15-16.

¹⁹⁹ Because Mr. Myers did not submit the proposed site certificate conditions in accordance with the set schedule, the ALJ also declines to consider Ms. Gilbert's March 30, 2022 brief filed in support of Mr. Myers' proposed conditions.

Idaho Power moves to strike: (1) portions of Mr. Myers' brief referring to testimony in *Sunrise Powerlink Transmission Line*; (2) portions of the brief referring to an article by Wei Zhaolin Gu; (3) portions of the brief referring to building codes and a building code website; (4) arguments not supported by evidence in the record; and (5) arguments outside the scope of Issue LU-9. Motion to Strike for Issue LU-9 at 4-7.

Because Mr. Myers did not timely offer testimony from the *Sunrise Powerlink* matter or the article by Zhaolin Gu into the hearing record, he may not rely on this evidence in his closing argument.²⁰⁰ Accordingly, gives these statements no weight. Although official notice may be taken of Oregon Building Code provisions, it is not clear from Mr. Myers' brief the provisions on which he seeks to rely. Furthermore, to the extent Mr. Myers raises concerns about suitable wind load design for transmission towers, that matter is outside the scope of the Land Use standard and Issue LU-9. Consequently, in accordance with Idaho Power's request, the ALJ gives no weight to arguments not supported by evidence in the record and/or arguments that are outside the scope of Issue LU-9.

Noise Control Rules

The General Standard of Review, OAR 345-022-0000(1)(b), mirrors the language in ORS 469.503(3). The rule requires that, to issue a cite certificate, the Council must determine that the preponderance of evidence on the record establishes that "the facility complies with all other Oregon statutes and administrative rules identified in the project order, as amended, as applicable to the issuance of a site certificate for the proposed facility."

To that end, the Council has historically evaluated whether a proposed facility complies with, among other regulations, the Noise Control laws, set out in ORS 467.010 *et seq.* and OAR Chapter 340, Division 035.

ORS 467.010 sets out the legislative findings and policy behind the noise control laws:

The Legislative Assembly finds that the increasing incidence of noise emissions in this state at unreasonable levels is as much a threat to the environmental quality of life in this state and the health, safety and welfare of the people of this state as is pollution of the air and waters of this state. To provide protection of the health, safety and welfare of Oregon citizens from the hazards and deterioration of the quality of life imposed by excessive noise emissions, it is hereby declared that the State of Oregon has an interest in the control of such pollution, and that a program of protection should be initiated. To carry out this purpose, it is desirable to centralize in the Environmental Quality Commission the authority to adopt reasonable statewide standards for noise emissions permitted within this state and to implement and enforce compliance with such standards.

²⁰⁰ *Second Amended List of Testimony and Exhibits* at 2 (noting that the B2H Project Record and documents listed in the Table of Additional Admitted Evidence are the only documents that the parties/limited parties may reference and/or rely upon in their closing briefs).

ORS 467.030 directs the Environmental Quality Commission (EQC) to adopt rules relating to noise control, and ORS 467.035 authorizes the EQC to adopt rules "exempt[ing] a class of activity within a category of noise emission sources from the application of a rule establishing maximum permissible levels of noise emission for that category of noise emission sources." In determining whether to grant an exemption, ORS 467.035(2) directs the EQC to consider the following:

- (a) Protection of the health, safety and welfare of the citizens of this state;
- (b) Feasibility and cost of noise abatement; and
- (c) Past, present and projected patterns of land use and such state and local laws and regulations as are applicable thereto.

ORS 467.060 addresses variances and states in pertinent part:

(1) The Environmental Quality Commission by order may grant specific variances from the particular requirements of any rule or standard to such specific persons or class of persons or such specific noise emission source, upon such conditions as it may consider necessary to protect the public health, safety and welfare. The specific variance may be limited in duration. The commission shall grant a specific variance only if it finds that strict compliance with the rule or standard is inappropriate because:

- (a) Conditions exist that are beyond the control of the persons applying for the variance;
- (b) Special circumstances render strict compliance unreasonable, unduly burdensome or impractical due to special physical conditions or cause;
- (c) Strict compliance would result in substantial curtailment or closing down of a business, plant or operation; or
- (d) No other alternative facility or method of operating is yet available.

OAR 340-035-0035 sets out the DEQ's Noise Control Regulations for Industry and Commerce. The rule provides, in pertinent part:

(1) Standards and Regulations:

* * * * *

(B) New Sources Located on Previously Unused Site:

- (i) No person owning or controlling a new industrial or commercial noise source located on a previously unused industrial or commercial site shall cause or permit

the operation of that noise source *if the noise levels generated or indirectly caused by that noise source increase the ambient statistical noise levels, L10 or L50, by more than 10 dBA in any one hour, or exceed the levels specified in Table 8*, as measured at an appropriate measurement point, as specified in subsection (3)(b) of this rule, except as specified in subparagraph (1)(b)(B)(iii).

(ii) The ambient statistical noise level of a new industrial or commercial noise source on a previously unused industrial or commercial site shall include all noises generated or indirectly caused by or attributable to that source including all of its related activities. * * *.

* * * * *

(3) Measurement:

(a) Sound measurements procedures shall conform to those procedures which are adopted by the Commission and set forth in Sound Measurement Procedures Manual (NPCS-1), or to such other procedures as are approved in writing by the Department;

(b) Unless otherwise specified, the appropriate measurement point shall be that point on the noise sensitive property, described below, which is further from the noise source:

(A) 25 feet (7.6 meters) toward the noise source from that point on the noise sensitive building nearest the noise source;

(B) That point on the noise sensitive property line nearest the noise source.

* * * * *

(6) Exceptions: Upon written request from the owner or controller of an industrial or commercial noise source, the Department may authorize exceptions to section (1) of this rule, pursuant to rule 340-035-0010, for:

(a) *Unusual and/or infrequent events*[.]

Emphasis added.

OAR 340-035-0010 states the exceptions to the DEQ's noise rules:

(1) Upon written request from the owner or controller of a noise source, the Department may authorize exceptions as specifically listed in these rules.

(2) In establishing exceptions, the Department shall consider the protection of health, safety, and welfare of Oregon citizens as well as the feasibility and cost of

noise abatement; the past, present, and future patterns of land use; the relative timing of land use changes; and other legal constraints. For those exceptions which it authorizes the Department shall specify the times during which the noise rules can be exceeded and the quantity and quality of the noise generated, and when appropriate shall specify the increments of progress of the noise source toward meeting the noise rules.

OAR 340-035-0100, addressing variances, parrots ORS 467.060, and provides:

(1) Conditions for Granting. The Commission may grant specific variances from the particular requirements of any rule, regulation, or order to such specific persons or class of persons or such specific noise source upon such conditions as it may deem necessary to protect the public health and welfare, if it finds that strict compliance with such rule, regulation, or order is inappropriate because of conditions beyond the control of the persons granted such variance or because of special circumstances which would render strict compliance unreasonable, or impractical due to special physical conditions or cause, or because strict compliance would result in substantial curtailment or closing down of a business, plant, or operation, or because no other alternative facility or method of handling is yet available. Such variances may be limited in time.

Identification of Noise Sensitive Properties – Issue NC-1

Issue NC-1: Whether the Department improperly modified/reduced the noise analysis area in Exhibit X from one mile of the proposed site boundary to ½ mile of the proposed site boundary and whether OAR 345-021-0010(1)(x)(E) requires notification to all owners of noise sensitive property within one mile of the site boundary.

Limited parties STOP B2H and Mr. Cooper have standing on Issue NC-1. STOP B2H filed testimony and closing arguments on this issue but Mr. Cooper did not submit testimony or argument. STOP B2H contends that the Department erred in modifying the requirements of OAR 345-021-0010(1)(x)(E)²⁰¹ to require that Idaho Power provide a list of NSR property owners within a half-mile (as opposed to one mile) of the site boundary. STOP B2H also argues that OAR 345-021-0010(1)(x)(E) requires Idaho Power to notify all NSR property owners and evaluate all NSRs within one mile of the site boundary and therefore the Department's reduction of the identification area boundary violates due process rights created by the rule. STOP B2H Closing Argument at 3-5.

Modification of the requirements in OAR 345-021-0010(1)(x)(E). Both the Department and Idaho Power respond to STOP B2H's first contention by asserting that OAR 345-021-0010(1) specifically authorizes the Department to modify the contents of the ASC in the project order to fit the circumstances of the proposed project. OAR 345-021-0010(1) states as follows:

²⁰¹ As previously noted, OAR 345-021-0010(1)(x)(E) states that the applicant "must include * * * [a] list of the names and addresses of all owners of noise sensitive property, as defined in OAR 340-035-0015, within one mile of the proposed site boundary."

The project order described in OAR 345-015-0160(1) identifies the provisions of this rule applicable to the application for the proposed facility, *including any appropriate modifications to applicable provisions of this rule*. The applicant must include in its application for a site certificate information that addresses each provision of this rule *identified in the project order*.

Emphasis added.

The ALJ agrees that the Department's project order governs the application requirements applicable to the proposed facility and that the Council's rules authorize the Department to modify the provisions of OAR 345-021-0010(1). As a matter of law, the Department has the authority to modify the ASC requirements, including the authority to reduce the area referenced in OAR 345-021-0010(1)(x)(E) from one mile to one-half mile.

In its Response Brief, STOP B2H argues that although OAR 345-021-0000(4)²⁰² authorizes the Department to waive the requirements in OAR 345-021-0010 that are not applicable to the proposed facility, the Department may do so only when the applicant submits a written request for waiver or modification of the requirements. STOP B2H contends that there is no evidence in the record establishing that Idaho Power submitted such a request and no evidence of the Department's determination that the one mile requirement is not applicable, and therefore the Department acted outside its authority in modifying the requirements of OAR 345-021-0010(1)(x)(E). STOP B2H Response Brief at 2-3.

The ALJ disagrees with STOP B2H's contention that OAR 345-021-0000(4) serves to limit the Department's authority to modify the ASC content provisions. Rather, the ALJ finds that while OAR 345-021-0000(4) authorizes the Department to modify the requirements of OAR 345-021-0010 on an applicant's written request, the rule does not prohibit the Department from making appropriate modifications to the application contents in the project order on its own accord. ORS 469.330 requires the Department to "issue a project order establishing the statutes, administrative rules, council standards, local ordinances, application requirements and study requirements for the site certificate application." OAR 345-015-0160(1) directs the Department to send the applicant a project order establishing, among other things, "all application requirements in OAR 345-021-0010 applicable to the proposed facility." Thus, it is the project order that identifies the applicable provisions of the content rule, including any appropriate modifications to applicable provisions of the rule. OAR 345-021-0010(1).

The Department has the inherent authority to modify the provisions of OAR 345-021-0010(1) via the project order, including the requirements of subparagraph (1)(x)(E). The Department does not need to produce evidence of an applicant's written request for waiver or modification to justify the change. Moreover, the Department is not required to document its determination to waive or modify the application content requirements anywhere other than in

²⁰² OAR 345-021-0000(4) states: "If the applicant submits a written request for waiver or modification of requirements in OAR 345-021-0010 to the Department, the Department may waive or modify those requirements that the Department determines are not applicable to the proposed facility."

the project order.²⁰³ Consequently, in this matter, the Department lawfully reduced the property owner identification area in Exhibit X from one mile to one-half mile of the proposed site boundary.

Notification/analysis area. STOP B2H next contends that by modifying the ASC requirements, the Department also improperly reduced the project's NSR notification and/or analysis area to one-half mile from the project site boundary.²⁰⁴ However, as both the Department and Idaho Power correctly note, OAR 345-021-0010(1)(x)(E) does not establish notification requirements. All this provision requires is that the applicant provide a list of the names and addresses of all owners of noise sensitive property, which Idaho Power provided in ASC Exhibit X, Attachment X-7.²⁰⁵ The requirements for public notice of a proposed project are set out elsewhere in the Council's rules, including OAR 345-015-0110(1), OAR 345-015-0220 and OAR 345-021-0010(1)(f). Consequently, contrary to limited parties' contention, OAR 345-021-0010(1)(x)(E) does not address notice. OAR 345-021-0010(1)(x) does not require that the Department or Idaho Power provide notice of potential noise impacts to owners of noise sensitive properties within a mile of the proposed site boundary.

Similarly, OAR 345-021-0010(1)(x)(E) does not establish or define the noise analysis area. Rather, the Department established the minimum required analysis areas for potential impacts from the project in the project order (*see* Second Amended Project Order, Section IV, Table 2).²⁰⁶ In this instance, the Department acted well within its authority in setting the minimum required analysis area purposes of the Noise Control rules as the area within the site boundary and one-half mile from the site boundary, based on the linear nature of the proposed facility. The limited parties have not demonstrated any unlawful or erroneous action by the Department in this context.

Variance/Exception to the Noise Rules – Issue NC-2

Issue NC-2: Whether the Department erred in recommending that Council grant

²⁰³ In the Second Amended Project Order, with regard to Exhibit X, the Department states: "All paragraphs apply. However, *because of the linear nature of the proposed facility*, the requirements of paragraph E are modified." (Emphasis added.)

²⁰⁴ In the context of the Noise Control issues, STOP B2H presented testimony from Fuji Kreider asserting that Idaho Power's March 24, 2020 letter to landowners along the Mill Creek Route in Union County was misleading and "undermined the public participation in and the credibility of this entire process." Kreider Dec. on NC-1, 2, 3, 4 at 1. In its closing briefs STOP B2H asserts that this letter (which states, in part, that Idaho Power is pursuing the Morgan Lake Alternative instead of the Mill Creek Route) served to mislead property owners along the proposed Mill Creek Route into believing that they no longer needed to participate in the contested case process. STOP B2H Response at 4-5. The ALJ finds that STOP B2H's claims regarding Idaho Power's March 24, 2020 letter to landowners fall outside the scope of this contested case and outside the scope of the Noise Control issues in particular. Accordingly, the ALJ declines to further address this particular issue.

²⁰⁵ See ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 334 of 371.

²⁰⁶ ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 25 of 29.

a variance/exception from the Oregon DEQ's Noise Rules, OAR 340-035-0035, and whether the variance/exception is inconsistent with ORS 467.010.

Several limited parties have standing on this issue: STOP B2H, Ms. Gilbert, Ms. Gray, Mr. Horst, Ms. Cavinato, and Mr. Myers. In challenging the Department's recommendation that Council authorize a variance and/or exception to the Noise Control rules, the limited parties' argue that: (1) neither the Department nor the Council have the authority to grant a variance; (2) even if the Council could grant a variance, Idaho Power has not demonstrated that the project meets the requirements for the variance; (3) Idaho Power is not entitled to an exception because it has not demonstrated that noise exceedances would be unusual or infrequent and; (4) Idaho Power has not demonstrated that the project is consistent with the policy in ORS 467.010. *See* STOP B2H Closing Argument; Gilbert Closing Brief on Issue NC-2; STOP B2H Response Brief.

Authority to grant the variance. Limited parties argue that the Council lacks the authority to grant a variance under the Noise Rules because, by statute, that authority rests solely with the EQC. In response, the Department and Idaho Power assert that the Council has comprehensive authority over energy facility siting matters, including the authority to apply the DEQ noise rules, assess a proposed facility's compliance with noise standards, and where appropriate, authorize an exception and/or variance.

For the reasons that follow, the ALJ agrees the Council has the jurisdiction and authority to determine whether the proposed facility meets the requirements for an exception and/or a variance from the ambient antidegradation standard, and is not required to consult with the EQC or DEQ in making its determination. First, pursuant to ORS 469.310, the very purpose of the energy facility statutes is to establish "a *comprehensive system* for the siting, monitoring and regulating of the location, construction and operation of all energy facilities in this state." (Emphasis added.) Second, as specified in ORS 469.370(7), the Council must determine whether the proposed facility complies with "the standards adopted under ORS 469.501 *and any additional statutes, rules or local ordinances determined to be applicable to the facility by the project order, as amended.*" Emphasis added. As the Department notes, these statutes recognize that the energy facility siting process is essentially a "one-stop" permitting process because the Council's decision to approve an application binds other state agencies and local governments to the construction and operation of the facility.

Indeed, to that end, ORS 469.401 provides in pertinent part:

Subject to the conditions set forth in the site certificate or amended site certificate, any certificate or amended certificate signed by the chairperson of the council shall bind the state and all counties and cities and political subdivisions in this state as to the approval of the site and the construction and operation of the facility. After issuance of the site certificate or amended site certificate, any affected state agency, county, city and political subdivision shall, upon submission by the applicant of the proper applications and payment of the proper fees, but without hearings or other proceedings, promptly issue the permits, licenses and certificates addressed in the site certificate or amended site

certificate, subject only to conditions set forth in the site certificate or amended site certificate. * * * Each state or local government agency that issues a permit, license or certificate shall continue to exercise enforcement authority over the permit, license or certificate.

Taken together, these statutes establish the authority of the Department and the Council to evaluate whether a proposed facility complies with statutes, rules, and standards normally administered by other agencies, and that the Council's findings and determination of compliance is binding on those agencies. When assessing whether a proposed facility complies with the Noise Control rules, the Council need not obtain approval from, or consult with, the EQC or the DEQ. This is especially true since the EQC and the DEQ suspended their responsibilities for administering the noise program. As stated in OAR 340-035-0110:

[T]he Commission and the Department have suspended administration of the noise program, *including but not limited to processing requests for exceptions and variances*, reviewing plans, issuing certifications, forming advisory committees, and responding to complaints. Similarly, the public's obligations to submit plans or certifications to the Department are suspended.

(Emphasis added.)

Furthermore, as set out in the findings, when the DEQ suspended its responsibilities on noise control matters, the agency specifically contemplated that local governments and in some cases, other agencies, would take over enforcement. The DEQ also recognized that the Department and the Council would continue to review site certificate applications to ensure that proposed facilities meet the State noise requirements.²⁰⁷ Considering that the DEQ has lacked the ability to process requests for exceptions and variances to the noise standards for the last 30 plus years,²⁰⁸ it would be absurd to conclude that the Council lacks the authority to make findings and rule on an applicant's request for a variance and/or exception under ORS 467.060, OAR 340-035-0010 and OAR 340-035-0100.²⁰⁹

In short, the ALJ rejects limited parties' argument that the authority to administer the noise control program and grant a variance under ORS 467.060 and OAR 340-035-0100 rests with EQC and EQC alone. Based on the provisions of ORS Chapter 469, OAR 340-035-0110, the DEQ's interpretation of administration and enforcement authorities under the noise standards, past practice by the Council, and common sense, the ALJ finds that the Council has

²⁰⁷ Rowe Dec., Attachment 1.

²⁰⁸ The Oregon Legislative Assembly withdrew all funding for implementing and administering ORS Chapter 467 and the noise program in 1991. OAR 340-035-0110.

²⁰⁹ As the Department notes, the Council has previously recognized that it has the authority to consider a variance under ORS 467.060 and OAR 340-035-0100 if a proposed facility would not otherwise comply with the noise standards. *See In the Matter of the Request for Amendment #2 of the Site Certificate for the Stateline Wind Project*, EFSC Final Order on Amendment #2, June 6, 2003 at 100.

the authority to make findings and to approve a variance from (and/or exception to) the requirements of OAR 340-035-0035.

Basis for granting a variance. The limited parties next argue that even if the Council has authority to grant a variance, the variance is improper because the project does not meet any of the special circumstances described in ORS 467.060(1) and OAR 340-035-0100(1). STOP B2H Closing at 8-9.

In the Proposed Order, the Department set out the bases for its recommendations that the Council grant both a variance and an exception from the strict application of the DEQ's ambient antidegradation standard. With regard to Idaho Power's request for a variance, the Department found that, although an applicant only needs to establish one of the listed criteria in the rule, Idaho Power actually demonstrated multiple bases for the variance. Specifically, the Department found that the Company demonstrated that conditions where exceedances could occur along the transmission line would be beyond Idaho Power's control because the Company cannot be accountable for foul weather conditions that may cause audible corona noise.²¹⁰ The Department also found that other legal constraints involved in the siting process were beyond Idaho Power's control and constituted special circumstances rendering strict compliance with the ambient antidegradation standard unreasonable, unduly burdensome and impractical.²¹¹ Finally, the Department found that strict compliance would result in the substantial curtailment or closing down (never building) the proposed transmission line and that there is not another alternative facility available.²¹² Consequently, the Department concluded that strict compliance with the noise rules was inappropriate under all four criteria set out in the statute and rule. The Department recommended that the Council impose Recommended Noise Control Condition 5 granting a variance to compliance with the ambient antidegradation standard established in OAR 340-035-0035(1)(b)(B).²¹³

The limited parties present argument, but no persuasive evidence establishing that the Department erred in its evaluation of the requested variance and/or in its recommendation to the Council to grant the variance as set out in Recommended Noise Control Condition 5. The limited parties argue, in essence, that the project is not entitled to a variance because, on occasion, the project will exceed the ambient antidegradation standard at noise sensitive

²¹⁰ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 664 of 10016.

²¹¹ *Id.* at 664-66 of 10016.

²¹² *Id.* at 666 of 10016. The limited parties' claims that Idaho Power could have routed the transmission line to avoid exceedances or should have selected the BLM preferred route (*see, e.g.*, STOP B2H Closing Arguments at 5-2, 25) fall outside the scope of the Council's review. Moreover, routes that may have avoided NSRs presented other siting problems. As noted in the findings, in selecting the proposed and alternative route segments, Idaho Power needed to balance a myriad of competing constraints and opportunities in addition to avoiding potential exceedances at NSRs along the route. *See* Stippel Rebuttal Test. at 10-12.

²¹³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 666-67 of 10016.

properties, especially along the Morgan Lake Alternative route. However, that is the very reason why the legislature created the variance in the first place – where special circumstances and physical conditions (such as those that exist with a linear energy facility) render strict compliance with the noise standards “inappropriate.” ORS 467.060(1). The Department’s findings, *i.e.*, that foul weather conditions are beyond Idaho Power’s control, that transmission lines are dispersed throughout a large area and common noise mitigation measures are not feasible, and that strict compliance would preclude the project from going forward, are supported by a preponderance of the evidence and justify the variance.

Basis for finding an exception. The limited parties also argue that the proposed facility is not entitled to an exception because foul weather is neither infrequent nor unusual in the region. STOP B2H Closing Argument at 7. In recommending that the Council exempt the proposed facility from the noise control standards, the Department found as follows:

Given that the policy [of the noise rules] is to protect citizens from excessive noise emissions which, under typical meteorological conditions for the region, is not expected from the proposed facility, it appears contrary not to consider foul weather events - the contributing factors of excessive noise emissions - unusual or infrequent under OAR 340-035-0035(6)(a). Therefore, based on the Department’s review, technical review and recommendations of its third-party consultant, Golder Associates, and the analysis presented above, the Department recommends Council find that exceedances of the ambient antidegradation standard during foul weather events would be infrequent or unusual under OAR 340-035-0035(6)(a) and that Council grant an exception to the proposed facility.

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 652 of 10016.

The limited parties dispute the Department’s determination. The limited parties base their challenge to the approval of an exception on John Hector’s opinion that potential exceedances occurring 48 days per year “does not meet the criteria of unusual or infrequent.”²¹⁴ However, as both the Department and Idaho Power note, Mr. Hector’s focus on this data point is misguided because the potential exceedances would not occur throughout those 48 days, but rather for a small portion of the day. When all hours of the year are considered (8,760 hours versus 365 days per year), foul weather is predicted to occur only 1.3 percent of the time over the

²¹⁴ STOP B2H Direct Ex. 5 at 13. On this point, Mr. Hector, a retired professional engineer who managed DEQ’s noise control program between 1973 and 1986, reported as follows:

ODOE recommends an exception to the ambient degradation rule be allowed because the exceedance events would be “unusual or infrequent”. However, the proposed order indicates exceedances could occur 48 days per year. This does not meet the criteria of unusual or infrequent. Thus, the basis of the request appears to be flawed.

Id.

course of a year.²¹⁵ Moreover, Mr. Hector's opinion has no context, no measurement criteria, nor any explanation as to what number or percentage of exceedances he would consider infrequent. Therefore, Mr. Hector's assertion is not persuasive.

In summary, a preponderance of the evidence establishes that, because corona sound from the transmission line will result in occasional exceedances of the ambient antidegradation standard, strict compliance with the DEQ's noise rules is not possible. However, because exceedances are only expected to occur during foul weather,²¹⁶ foul weather events are infrequent in the project area, and other circumstances need to occur simultaneously to result in an exceedance (*i.e.*, low ambient noise environment and transmission line operating at full capacity), the ALJ finds that exceedances along the transmission line will be an infrequent event (occurring less than 2 percent of the time). Even singling out the La Grande area, which has a higher frequency of foul weather conditions than Flagstaff Hill, Owyhee Ridge or Umatilla, Idaho Power's modeling indicates that exceedances are predicted to occur only 2.66 percent of the time.²¹⁷ Furthermore, it is important to note that even during foul weather conditions, the proposed facility will not generate noise in excess of 50 dBA maximum allowable sound level for industrial sources.²¹⁸ For these reasons, the Department appropriately determined that the proposed facility is entitled to an exception under OAR 340-035-0035(6)(a).

Consistency with ORS 467.010. Finally, the limited parties contend that the proposed variance and/or exception to strict compliance with the noise rules is inconsistent with the provisions of ORS 467.010. As set out above, ORS 467.010 establishes the legislative policy behind the noise control rules, *i.e.*, "[t]o provide protection of the health, safety and welfare of Oregon citizens from the hazards and deterioration of the quality of life imposed by excessive noise emissions."

Contrary to the limited parties' contentions, a preponderance of the evidence demonstrates that the proposed facility will not present a threat to the environmental quality of life in this state and the health, safety and welfare of the people of Oregon. As discussed above, in the Proposed Order, in its determination whether the proposed facility was entitled to a variance and/or exception to the noise rules, the Department specifically considered the factors

²¹⁵ ASC Exhibit X, at X-24, ODOE – B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 28 of 371.

²¹⁶ Although corona sound may occur in high humidity conditions, the sound level associated with humidity-caused corona sound is significantly quieter than corona triggered by rain or foul weather, and will not result in exceedances. Bastasch Rebuttal Test. at 82. Moreover, corona sound resulting from nicks, scratches, and debris are most likely to occur during the burn-in period, which is temporary and not regarded as "typical operations" that would serve as the basis for an "infrequency" definition. *Id.*, see also Miller Cross-Exam. Test., Tr. Day 1 at 37.

²¹⁷ See ASC Exhibit X, Table X-6, ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, page 28 of 371.

²¹⁸ See ASC Exhibit X, Table X-5, ODOE - B2HAPPDoc3-41 ASC 24_Exhibit X_Noise_ASC 2018-09-28, pages 24-25 of 371.

set out in OAR 340-035-0010(2): protection of public health and safety, feasibility and cost of noise abatement, land use patterns and changes, and other legal constraints.

The Department found that by developing and implementing site-specific mitigation plans (Recommended Noise Control Condition 1) and developing and implementing a complaint response plan (Recommended Noise Control Condition 2), the construction and operation of the proposed facility would not preclude the protection of health, safety, and welfare of Oregon citizens otherwise afforded through compliance with DEQ's noise control regulation.²¹⁹ Moreover, the Department's and Idaho Power's proposed revisions and amendments to Noise Control Conditions 1 and 2 (discussed below in connection with Issue NC-4) provide further protections for owners and residents of NSRs near the project.

Based on the anticipated infrequent and minimal noise impacts and the site certificate conditions meant to protect the health and safety of nearby residents, a preponderance of the evidence establishes that the project is protective of human health. The record also demonstrates that, given the nature of the proposed facility, typical noise abatement technologies are not feasible.²²⁰ Additionally, as the Department appropriately found, future land use changes are unlikely to occur at or near the relevant NSRs and other legal constraints directed the placement of the proposed transmission line with respect to NSRs.²²¹

In short, the limited parties raised arguments, but have not provided any persuasive evidence to support their position that the Department erred in recommending that the Council grant the proposed facility a variance and/or exception. A preponderance of the evidence establishes that the Department's recommendations in this regard are consistent with the legislative policy established in ORS 467.010. The construction and operation of the proposed facility does not threaten the environmental quality of life in this state and the health, safety and welfare of the people of Oregon.

Ruling on Idaho Power's Motion to Strike Portions of Ms. Gilbert's Closing Argument on Issue NC-2:

Idaho Power moves to strike, or in the alternative asks that no weight be given to, statements in Ms. Gilbert's Closing Argument on Issue NC-2 that are not relevant to, and outside the scope of, this issue including her challenges to Idaho Power's methodologies for measuring baseline noise levels and potential exceedances. Motion to Strike, Issue NC-2 at 7.

The ALJ agrees that the challenged statements in Ms. Gilbert's Closing Brief are outside the scope of Issue NC-2. Issue NC-2 asks whether the Department erred in recommending that the Council grant a variance or exception to the Noise Control Rules. Issue NC-2 does not concern Idaho Power's methods for monitoring and measuring sound. Issues NC-3 and NC-6

²¹⁹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 655 of 10016.

²²⁰ *Id.* at page 656 of 10016.

²²¹ *Id.* at pages 656-61 of 10016.

involve challenges to Idaho Power's methodology, but Ms. Gilbert does not have standing on either of those issues. Accordingly, in resolving Issue NC-2, the ALJ gives no weight to the statements and arguments in Ms. Gilbert's brief that are not pertinent to the variance/exception question.

Ruling on Idaho Power's Motion to Strike Portions of Mr. Myers' Closing Argument on Issue NC-2:

Idaho Power moves to strike, or in the alternative asks that no weight be given to, statements in Mr. Myers' Closing Argument on Issue NC-2 that pertain to wildfire concerns and statements that rely on evidence that is not included in the evidentiary record in this contested case. Motion to Strike, Issue NC-2 at 7-8.

The ALJ agrees that the challenged statements in Mr. Myers' Closing Argument are outside the scope of Issue NC-2. As previously noted, Issue NC-2 asks whether the Department erred in recommending that the Council grant a variance or exception to the Noise Control Rules. Issue NC-2 does not concern the proposed project's potential to ignite wildfires. Accordingly, in resolving Issue NC-2, the ALJ gives no weight to the statements in Mr. Myers' brief that are not pertinent to the noise rules issue.

Methodology for the acoustical analysis – Issues NC-3 and NC-6

Issue NC-3: Whether the methodologies used for the noise analysis to evaluate compliance with OAR 340-035-0035 were appropriate and whether the ODOE erred in approving the methodology used to evaluate compliance with OAR 340-035-0035.

Limited party STOP B2H has standing on Issue NC-3. STOP B2H argues, in essence, that Idaho Power's methodology for measuring baseline ambient sound at NSRs was flawed and not appropriate for measuring the proposed facility's impacts to public health, safety, or welfare. Specifically, STOP B2H contends that: (1) MP 11 is not representative of the relevant NSRs; (2) Idaho Power's analysis did not account for conditions other than foul weather that can result in corona noise; and (3) the Department erred in approving Idaho Power's methodology and in approving an exception/variance for the entire transmission line, as opposed to particular NSRs. STOP B2H Closing Arguments at 10-15.

Both the Department and Idaho Power contend that Idaho Power's methodologies for assessing compliance with the Noise Control rules are appropriate and that the Department did not err in concurring with Idaho Power's noise analysis methods. For the reasons that follow, the ALJ also finds that Idaho Power's multi-step methodology is a reasonable and appropriate approach to evaluating the proposed facility's compliance with the Noise Control rules.

MP 11 as representative of NSRs in Union County. As noted above, STOP B2H challenges Idaho Power's choice to use MP 11 as representative of the NSRs along the Morgan Lake Alternative route. STOP B2H asserts that MP 11's proximity to I-84, Highway 30, and the Union Pacific train service means it is not representative of the quieter rural NSRs in Union

County near Morgan Lake. Based on witness testimony and Mr. Standlee's sound monitoring at Mr. Larkin's property near Morgan Lake, STOP B2H argues that Idaho Power should have assigned a much lower baseline sound level than 32 dBA to represent the NSRs along the Morgan Lake Alternative. STOP B2H Closing Argument at 11-12. STOP B2H also argues that Idaho Power's supplemental sound monitoring at MPs 100, 101, and 102 was compromised and also not representative of the baseline sound levels of NSRs near Morgan Lake. *Id.* at 12-14.

Idaho Power responds to these challenges to MP 11 by explaining that the sounds of passing trains at MP 11 are not likely to have influenced the calculation of the ambient sound level because train noise does not persist for at least 30 minutes out of each hour. Idaho Power also explains that even if there was an instance where a very long train or several trains passed close in time causing the noise spike to persist for 30 minutes or more, this would not impact the average ambient sound level. This unique sound spike would effectively be filtered out over the long-term (one month) sampling period, because the L_{50} is an average of all total hours.²²² Given this persuasive evidence, STOP B2H has not demonstrated that MP 11's proximity to train tracks distinguishes it from other NSRs in Union County and makes it an unsuitable proxy.

Furthermore, STOP B2H has not established its claim that Idaho Power's supplemental monitoring at MP 100, MP 101, MP 102 and MP 103 was faulty and/or not representative of the Morgan Lake NSRs. As set out in the findings, Idaho Power monitored and measured sound at these MPs for three weeks in October 2021.²²³ Idaho Power selected these monitoring points to represent NSRs nearer to Morgan Lake and, for MP 103, in the La Grande valley closer to I-84. Idaho Power used the same conservative approach used in its initial monitoring, and established the baseline noise levels based on the quiet late-night period of midnight to 5:00 a.m. with calm winds. In this supplemental monitoring, the mean L_{50} was 31 dBA at MP 100; 36 dBA at MP 101; 32 dBA at MP 102; and 43 dBA at MP 103.²²⁴ The one decibel difference between MP 100 and MP 11 (31 dBA vs 32 dBA) is so subtle that it is not perceivable by the human ear.²²⁵ Consequently, the sound levels measured at MP 100 do not invalidate Idaho Power's initial selection of MP 11, nor should the supplemental monitoring results impact or alter the Council's evaluation of the proposed facility's compliance with the Noise Rules.²²⁶ Rather, the results of

²²² Bastasch Rebuttal Test. at 61-63; *see also* Bastasch Cross-Exam. Test., Tr. Day 1 at 124-25.

²²³ STOP B2H faults Idaho Power for not re-monitoring ambient sound at MP 11 in its supplemental monitoring in 2021. *See* STOP B2H Surrebuttal Exhibit A. However, the purpose of this supplemental monitoring was to collect data at positions that were closer to the NSRs along the proposed routes in Union County and not to verify the results of the prior monitoring at MP 11. Bastasch Cross-Exam. Test., Tr. Day 1 at 70-71. Therefore, there was no reason for Idaho Power to re-monitor the sound levels at MP 11.

²²⁴ Bastasch Sur-surrebuttal Test Ex. I; Bastasch Cross-Exam. Test., Tr. Day 1 at 58-60.

²²⁵ Bastasch Cross-Exam. Test., Tr. Day 1 at 65.

²²⁶ As Idaho Power notes, even if the Company's initial selection of MP 11 was not reasonable, the relevant question still remains whether the 32 dBA ambient sound level that Idaho Power used to determine exceedances in the Morgan Lake area (for NSRs along both the Mill Creek and Morgan Lake Alternative routes) was in fact representative. Given the results of Idaho Power's supplemental

the supplemental monitoring serve to confirm that the 32 dBA ambient baseline measured at MP 11 is fairly representative of other NSRs in Union County.²²⁷

Mr. Standlee's monitoring at Mr. Larkin's residence is not persuasive evidence that the ambient sound levels at NSRs in the vicinity of Morgan Lake are likely 10 to 12 decibels lower than the 32 dBA measured at MP 11 (or the 31 dBA measured at MP 100). As Mr. Standlee conceded in his Surrebuttal Report (STOP B2H Surrebuttal Exhibit A at 7), the results from one night of measurements at the residence should not be used to determine representative ambient noise levels for the residence. Simply stated, the dataset from the Larkin residence is simply too small to prove anything with regard to the average ambient sound levels for NSRs along the Mill Creek or the Morgan Lake Alternative routes. Similarly, the data from the Larkin residence does not establish that Idaho Power's methodology for determining average ambient sound levels was flawed or otherwise inappropriate.

In its Closing Arguments, Idaho Power noted that because MP 100 is significantly closer to the Morgan Lake Alternative than MP 11, it is appropriate to use the MP 11 ambient sound level (31 dBA) to calculate exceedances for the NSRs along the Morgan Lake Alternative. Accordingly, Idaho Power proposed revising Recommended Noise Control Condition 1 to include the two additional potential exceedances (at NSR 118 and NSR 132), thereby requiring the Company to work with the property owners for appropriate mitigation. Idaho Power Closing Arguments, Issues NC-1, NC-2, NC-4 and NC-6 at 87-88. The ALJ accepts Idaho Power's proposal and, as discussed below, recommends revising Recommended Noise Control Condition 1 accordingly.

Other causes of corona noise. In its Closing Argument, STOP B2H also asserts that Idaho Power's analysis of frequency of exceedances did not account for other conditions that can create corona noise, such as fog, snow, humidity, condensation and physical issues, such as nicks, scrapes and debris on the conductors. STOP B2H Closing at 14-15.

As discussed above in connection with Issue NC-2, Idaho Power has acknowledged that corona noise can result from other conditions. However, a preponderance of the evidence also

monitoring (with results ranging from 31 dBA at MP 100 to 45 dBA at MP 103) a preponderance of the evidence demonstrates that Idaho Power's use of 32 dBA was reasonable and fairly representative of the NSRs in the Morgan Lake area. Furthermore, even when the ambient sound level is assumed to be 31 dBA for all NSRs in the area of Morgan Lake, the analysis results in only two more exceedances at residential NSRs along the Morgan Lake Alternative (NSR 119 and 132), and no additional exceedances along the Mill Creek Route. Bastasch Sur-surrebuttal Ex. B at 3-4; Bastasch Cross-Exam. Test., Tr. Day 1 at 62.

²²⁷ STOP B2H's claims that MP 100 is windier than other NSRs along the Morgan Lake Alternative and therefore not representative of the other NSRs are unsupported by evidence and not persuasive. Also not persuasive are STOP B2H's claims that Idaho Power's supplemental monitoring results may be invalid because of data gaps at certain locations from when the monitoring equipment temporarily shut down due to a loss of solar battery power. As Mr. Bastasch testified, there is no reason to believe these data gaps would influence the sound levels recorded late at night on subsequent dates. *See* Bastasch Cross-Exam. Test., Tr. Day 1 at 58.

establishes that corona noise from other weather conditions (such as humidity) is significantly less than corona noise caused by precipitation, and will not result in exceedances of the ambient antidegradation standard. Additionally, corona sounds that result from nicks, scratches, or debris would be a temporary issue, not regarded as typical operations and, after the burn-in period, promptly remedied with maintenance.²²⁸ Therefore, STOP B2H has not demonstrated that Idaho Power's noise analysis underestimated the number of, or potential for, exceedances of the ambient antidegradation standard.

Variance/Exception for the entire project. Finally, STOP B2H contends that the Department erred in approving Idaho Power's methodology and the request for a variance/exception for the entire line, as opposed to specified NSRs where exceedances are anticipated. STOP B2H Closing at 15-16.

On this first point, STOP B2H has presented no persuasive evidence or argument to establish that Idaho Power's methodology for assessing noise impacts was flawed or invalid, and no persuasive evidence that the Department erred or exceeded its authority in approving Idaho Power's sound measurement procedures. Indeed, OAR 340-035-0035(3)(a) expressly authorizes the reviewing agency to approve sound measurement procedures and, as explained in the Proposed Order, the Department and its noise consultants (Golder Associates) appropriately vetted and concurred with Idaho Power's methodology.²²⁹

Similarly, on the second point, STOP B2H provided no persuasive evidence or argument that the Department erred in recommending that the Council grant an exception from compliance with the ambient antidegradation standard for the entire line. As discussed in the Proposed Order, the ambient degradation standard does not address the difference between a non-linear or linear facility. However, the Council should acknowledge those differences in its evaluation of the project's compliance with the noise rules. In the Proposed Order, the Department acknowledged the extent of exceedances predicted to occur in each of the five counties crossed by the proposed facility, including alternate segments. The Department concurred with Idaho Power's request to interpret the ambient antidegradation standard under OAR 340-035-0035(1)(b)(B)(i) as applying to the transmission line as the noise source, where identified NSRs represent the appropriate measurement points for which to determine overall compliance of the transmission line.²³⁰ This is a much more practical approach than evaluating the request for an exception at each of the more than 40 identified NSR locations where exceedances could potentially occur.

In summary, a preponderance of the evidence establishes that Idaho Power's methodologies for evaluating compliance with OAR 340-035-0035 were appropriate and the Department did not err in approving Idaho Power's methodology.

²²⁸ See Bastasch Rebuttal Test. at 43.

²²⁹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 634-635 of 10016.

²³⁰ *Id.* at page 650 of 10016.

STOP B2H proposed site certificate conditions related to Issue NC-3:

STOP B2H proposed that Idaho Power be required to conduct new baseline sound measurements to determine the extent of potential exceedances of the ambient antidegradation standard. See STOP B2H Proposed Site Conditions at 1, 3. Both the Department and Idaho Power object to this proposal as unnecessary.

The ALJ agrees with the Department and Idaho Power that a new baseline study is unnecessary. As discussed above, a preponderance of the evidence establishes that Idaho Power's methodology was appropriate and that the original and supplemental monitoring adequately represents the baseline ambient sound levels. Consequently, STOP B2H's proposed condition is rejected.

Issue NC-6: Whether Applicant's methodology to assess baseline noise levels reflect reasonable baseline noise estimates for residents of the Morgan Lake area.

Limited party Dianne Gray has standing on Issue NC-6. Like STOP B2H's arguments under issue NC-3, Ms. Gray contends that MP 11 is not representative of the NSRs near Morgan Lake, and that Idaho Power erred in using 32 dBA as its baseline ambient sound level for the Union County NSRs. Specifically, Ms. Gray asserts that measurements taken at MP 11 in 2012 should not apply to Morgan Lake area properties in 2021; that highway and train traffic near MP 11 influenced the L₅₀ measurement at that location; and that Idaho Power's supplemental monitoring sites (MPs 100, 101, 102 and 103) are not reliable or representative of Morgan Lake NSRs. Gray Closing Brief at 12-13; Gray Response Brief at 2-4.

As discussed above, a preponderance of the evidence establishes that Idaho Power's methodology for assessing baseline noise levels was appropriate and allowable under OAR 340-035-0035(3). In addition, a preponderance of the evidence establishes that Idaho Power's initial use of MP 11 (and the baseline ambient sound level of 32 dBA), as well as its supplemental consideration of MP 100 (and the baseline ambient sound level of 31 dBA) are reasonably representative of the NSRs near Morgan Lake.

Ms. Gray presents no persuasive evidence to support her assertion that measurements taken at MP 11 in 2012 should not apply to Morgan Lake area properties. On the other hand, Idaho Power has shown through its supplemental monitoring at MPs 100, 101, 102, and 103, that the measurements taken at MP 11 in 2012 are fairly representative of the NSRs near Morgan Lake. Second, Ms. Gray presents argument, but no persuasive evidence that highway and train traffic near MP 11 affected the L₅₀ noise level at that location. As discussed above in connection with Issue NC-3, the sounds of passing trains at MP 11 are not likely to have influenced the calculation of the ambient sound level because train noise does not persist for at least 30 minutes out of each hour. Furthermore, to the extent that Ms. Gray challenges Idaho Power's use of the L₅₀ standard, this statistical noise level is specifically authorized in OAR 340-035-0035 to determine exceedances of the antidegradation standard.

Finally, Ms. Gray presents no persuasive evidence to support her contention that the

results of Idaho Power's supplemental monitoring are unreliable or not representative of NSRs near Morgan Lake. For the same reasons discussed above in connection with Issue NC-3, the ALJ finds that the supplemental monitoring results serve to confirm Idaho Power's use of 32 dBA (or 31 dBA) as the ambient baseline noise level for NSRs near Morgan Lake.

Gray proposed site certificate conditions related to Issue NC-6:

In her Closing Brief, Ms. Gray proposed three site certificate conditions related to Issue NC-6.²³¹ Idaho Power opposes these proposed conditions as impractical and unnecessary (Idaho Power's Response Brief and Motion to Strike for Contested Case Issues NC-1, NC-2, NC-3, NC-4 and NC-6, p. 50-52) and Council agrees. Ms. Gray's proposed Condition 1 is unsupported by Council standard or DEQ's noise control regulation – there are no legal requirements under OAR 345-035-0035 that would support Council imposing a requirement that Idaho Power conduct ambient monitoring at every NSR that could potentially be impacted by corona noise.

Council rejects Ms. Gray's second proposed condition for several reasons. First, while the paragraph narrative is proposed as a condition, it is not written in condition format. Ms. Gray proposes language such as "it would be helpful" and "it would be good to know." Ms. Gray's proposed condition would require more information on the basis for selecting monitoring positions and confirmation of whether field trips were conducted to affirm the representativeness of the ambient noise conditions at the selected monitoring positions compared to ambient noise conditions of NSRs within the analysis area. This is not appropriate is a condition and ignores the findings of fact, findings of fact, and opinion included in this order for Issue NC-3, where any questions on the validity of the ambient noise monitoring positions have been fully litigated and affirmed.

Sufficiency of proposed mitigation – Issue NC-4

Issue NC-4: Whether the mitigation/proposed site conditions adequately protect the public health, safety and welfare.

STOP B2H has standing on Issue NC-4. On this issue, STOP B2H asserts that, in the event the site certificate is approved, the Recommended Noise Control Conditions in the Proposed Order do not go far enough to protect the public health, safety, and welfare from project-related noise. Specifically, STOP B2H contends that, as set out in the Proposed Order, Recommended Noise Control Condition 1 does not adequately protect potentially impacted NSRs or the people who reside on those properties. STOP B2H asks Idaho Power's obligation to work with all owners of NSRs where exceedances are predicted be expanded to include notification to all NSR property owners within one mile of the proposed facility. STOP B2H also requests that Idaho Power be required to update the list of NSRs in Attachment X-7. STOP B2H Closing Argument at 17-18. Additionally, STOP B2H requests revisions to Recommended Noise Control Condition 2 to improve the noise complaint procedure and response plan and revisions to Noise Control Condition 3 to include additional mitigation measures. *Id.* at 19-20.

In their respective Closing and Response briefs, both the Department and Idaho Power proposed revisions to the Recommended Noise Control Conditions incorporating many of STOP B2H's suggestions and clarifying Idaho Power's obligations for working with NSR property

owners, implementing mitigation measures, and addressing noise complaints. In its Response Brief and Closing Arguments, STOP B2H also proposed revisions to each Noise Control Condition.

STOP B2H's proposed conditions are addressed below.

²³¹ In her Closing Brief, Ms. Gray proposed that Idaho Power be required to: (1) monitor every NSR where exceedances could occur; (2) provide more detailed information about the NSRs along the proposed route(s); and (3) offer noise mitigation measures (home retro-fits and window treatments) to all NSRs regardless of predicted exceedances at the location. Gray Closing Brief at 13-15.

As for Issue NC-4, a preponderance of the evidence establishes that the proposed mitigation measures and the Recommended Noise Control Conditions (as amended in the section below) adequately protect the public health, safety, and welfare.

Proposed revisions to Recommended Noise Control Conditions:

Noise Control Condition 1. In its rebuttal testimony, Idaho Power proposed revisions to Recommended Noise Condition 1 to address limited parties' concerns regarding mitigation for corona noise impacts.²³² In its Closing Brief, the Department agreed that setting out the specific mitigation measures would improve Noise Control Condition 1, as would clarifying the timeline for mitigation and incorporating a dispute resolution process. The Department proposed revisions to the condition to address these concerns. ODOE Closing Brief at 112-13. In its Response Brief, Idaho Power agreed with the Department's proposals and added provisions to clarify Idaho Power's mitigation obligations. Idaho Power proposed that, as a condition of the granting of the variance and exceedance, the Company be required to offer mitigation measures to minimize the impacts of those exceedances, including exceedances that are currently predicted and new exceedances that might be established through the complaint procedure contained in Noise Control Condition 2. Idaho Power's Response at 59. In its Response Brief, STOP B2H recommended adding detail to the notice requirement and removing some specific remedies to preserve flexibility. STOP B2H Response at 24-26.

STOP B2H's proposed revisions to Noise Control Condition 1 as included in their Closing Arguments are presented below:

STOP B2H Proposed Noise Control Condition 1: "should not be limited to only those NSRs [{"Noise Sensitive Receptors"}] listed in the draft site certificate conditions, Attachment 1 in the PO (also in Attachment X-5).

- 1) The problems with the baseline study needs to be resolved via new monitoring study, paid for by the developer.
- 2) Those NSRs that are likely to exceed the 10 dBA ambient antidegradation standard must be notified by the developer and/or ODOE during the PRE-NC-01 phase.
- 3) Those NSRs may negotiate the site-specific Noise Exceedance Mitigation Plans. ODOE -B2HAPPDoc2-1 Proposed Order on ASC wHyperlink Attachments 2019-07-02. Page 624 of 699.

- 4) Under Site condition 1 part b., if the developer and the NSR cannot come to agreement after multiple attempts, the ODOE should attempt to mediate a plan, refer to an ADR (alternative dispute mediator), or refer to an appropriate legal jurisdiction."

Idaho Power and the Department oppose Stop B2H's proposed condition revision sub(1) above because it ignore the evaluation of Issue NC-3 and the outcome of the contested case. There is no basis to require a new monitoring study as the existing monitoring study has been supplemented and further validated through the contested case.

Idaho Power, the Department and Stop B2H agree in concept with STOP B2H's proposed Noise Control Condition 1 Sub 2; and, Idaho Power has volunteered to provide notice of the Noise Compliant Response Plan and condition requirements to all NSRs of record within 1-mile of the transmission line route selected at final design. Neither Idaho Power or the Council agree that all NSRs within 1-mile of the transmission line should be able to negotiate site-specific Noise Exceedance Mitigation Plan. Council does not have authority to require mitigation if there is no evidence of an impact – the record shows that exceedances are only predicted at 41 NSR locations. There is no evidence that would suggest all NSRs within 1-mile of the 300-mile transmission should receive the same level of mitigation as the NSRs with predicted exceedance.

The Council agrees with STOP B2H's Noise Control Condition 1 sub (4), but rather affirms that the review of any disputes of mitigation must be referred and reviewed by Council, unless the Council Chair defers the dispute review to the Department.

Based on consideration of STOP B2H's proposal and the Department's and Idaho Power's stipulations, the ALJ recommends that Noise Control Condition 1 state as follows:

Amended Recommended Noise Control Condition 1:

Prior to construction, the certificate holder will **initiate discussions** with the following 41 NSR property owners at which it has estimated exceedances of the ambient antidegradation standard may occur identified in Attachment X-5 and/or Attachment X-4 of the Final Order on the ASC (NSR: 8, 9, 10, 11, 5002, 69, 70, 5004, 46, **118**, 125, 5010, 5011, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 518, 111, 112, **132**, 133, 5008, 5009, 113, and 115) to develop mutually agreed upon Noise Exceedance Mitigation Plans, specific to each NSR location. The site-specific Noise Exceedance Mitigation Plans will include agreed upon measures that would be implemented at the NSR location to minimize or mitigate the ambient antidegradation standard noise exceedance.

a. If the certificate holder and the NSR property owner **agree upon a specific Noise Mitigation Plan**, the certificate holder will submit a signed acknowledgement from the property owner to the Department for its records.

²³² Bastasch Rebuttal Test. at 55-56.

b. If an agreement between certificate holder and NSR property owner is not obtained, the certificate holder shall concurrently notify the Department and NSR property owner of the dispute and of Council review of the dispute to occur at the next regularly scheduled Council meeting, to the extent possible, from the date of the certificate holder's notice. The notice shall explain that the NSR property owner will be given an opportunity to provide comments to the Council on the dispute, unless the Council Chair defers the dispute review to the Department. Review of the dispute will be based on the information per sub(i) below, and any other relevant facts provided by the NSR property owner and will result in a determination of the appropriate mitigation measure(s), proportional to the facility operational noise levels in excess of the ambient degradation standard, as determined to occur at the NSR property. The Council or Department's determination of appropriate mitigation is not binding on the NSR property owner or certificate holder if the NSR property owner opts not to accept the mitigation.

i. At the time of issuance of the notice per (b) above, certificate holder will submit to the Department: (1) the mitigation measures it offered the NSR property owner, the mitigation measures that the NSR property owner requested and an explanation of the dispute; (2) a list of the dates that the certificate holder communicated with, or attempted to communicate with, the NSR property owners; and (3) the names, addresses, and phone numbers of the NSR owners.

c. In working with NSR property owners under this condition, certificate holder will propose corona-noise mitigation of installation of sound-attenuating windows for residential structures as follows:

i. For NSRs where an 11 to 14 dBA sound level increase above ambient noise levels are expected, certificate holder will purchase and install sound attenuating windows with an STC rating of 25-40.

ii. For NSRs where a 15 dBA or greater sound level increase is expected, certificate holder will purchase and install sound attenuating windows with an STC rating of above 40.

iii. If an owner of an NSR where an 11 dBA or greater sound level increase is expected provides a letter from a health care provider indicating that health care provider's belief that the owner has a health condition that is exacerbated by increased sound levels, upon request, certificate holder will purchase and install sound attenuating windows with an STC rating of over 40 and would work with the NSR property owner to consider other mitigation options, as appropriate. During landowner consultations required under this condition, the certificate holder will specifically ask each landowner whether that landowner has a health condition that the landowner believes is

exacerbated by elevated sound levels.

iv. At the request of an NSR property owner, certificate holder will offer alternative mitigation proposals, such as performing air-sealing of the NSR residence, planting trees, or installing insulation.

d. Prior to operation, the certificate holder will implement the mitigation measures agreed upon with the NSR property owners and/or as determined by EFSC or the Department to be the appropriate mitigation measures.

Noise Control Condition 2. In its Closing Argument, STOP B2H proposed revisions to Noise Control Condition 2, as follows:

STOP B2H Proposed Noise Control Condition 2: “should not wait until the operation phase to develop a complaint response plan to address noise complaints.”

In its Closing Argument, the Department proposed extensive revisions to Recommended Noise Control Condition 2 to set out the processes for addressing complaints. ODOE Closing Brief at 116-18. In its Response Brief, Idaho Power agreed with the Department’s proposals, and proposed further revisions for clarification (in part to implement STOP B2H’s requests) and to ensure consistency with the other Noise Control conditions. In its Response Brief, STOP B2H also proposed changes to streamline the notification and complaint processes. STOP B2H Response at 27-30. The condition, as presented below, would require that Idaho Power prepare the Operational Noise Complaint Response Plan, prior to construction. Therefore, the condition aligns with STOP B2H’s proposed language – where they expressed a concern that the Noise Compliant Response Plan may not be developed until the operational phase – which is not the case.

Based on the parties’ stipulations, Noise Control Condition 2 should state as follows:

Amended Recommended Noise Control Condition 2:²³³

a. After the Site Certificate has been issued and before landowner consultations contemplated in Condition 1, the certificate holder will prepare a new version of Attachment X-7, which will update landowner information and correct any errors (Updated Attachment X-7). The certificate holder will send notices to all landowners listed in Updated Attachment X-7, which notice shall inform the recipient: (a) that the recipient is the owner of an NSR; (b) the requirements and condition language of Noise Control Conditions as adopted by the Council; and (c) a plain summary of the steps designated Noise Control Conditions 1 and 2. In addition, prior to construction, the certificate holder shall develop and submit to the Department an operational noise complaint response plan as well as distribute a simplified operational noise complaint response plan for landowners to the landowners listed in Updated Attachment X-7.

b. The plan shall specify that it is intended to address complaints filed by persons falling into one of the following categories: (1) the owner of an

NSR property identified in Noise Control Condition 1, and for whom has received mitigation under Noise Control Condition 1, but who believes that exceedances (as measured at their NSR property) are occurring in a manner not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5; or (2) An owner of an NSR property within one mile of the site boundary who was not identified under Noise Control Condition 1 and who has not received mitigation from the certificate holder, but who nevertheless believes that

²³³ Given the Department's extensive revisions to this condition in its Closing Brief and Idaho Power's concurrence with those revisions, the Department's revisions are in normal font and Idaho Power's subsequent changes (as set out in the Response Brief) are in bold.

exceedances above the ambient degradation standard have occurred at their NSR property.

c. The plan shall include the following: Scope of the complaint response plan, including process for complaint filing, receipt, review and response. The scope shall clearly describe how affected persons will be provided necessary information for filing a complaint and receiving a response, **and will specify the information that the complainant must include in its complaint, including the date the certificate holder received the complaint, the nature of the complaint, weather conditions of the date for which the complaint is based (including wind speed, temperature, relative humidity, and precipitation), duration of perceived noise issue, the complainant's contact information, and the location of the affected property.**

d. The plan shall require that the certificate holder notify the Department within three working days of receiving a noise complaint related to the facility. The notification shall include the date the certificate holder received the complaint, the nature of the complaint, weather conditions of the date for which the complaint is based (such as wind speed, temperature, relative humidity, and precipitation) as described by the complainant, duration of perceived noise issue, the complainant's contact information, the location of the affected property, and a schedule of any actions taken or planned to be taken by the certificate holder (including inspection and maintenance actions, or actions taken or planned to be taken pursuant to the processes described in subsection (e) of this condition).

e. The plan shall identify the following process if a noise complaint is received:

i. The certificate holder shall assess possible causes of the corona noise. If the complaint is received within the first 12 months of operation, the certificate holder will assess whether the corona noise is typical of noise that occurs during the transmission line "burn in period" (the first 12 months of operation) and ensure that it **already** has taken appropriate measures near that NSR to minimize corona noise that may occur during the burn in period (e.g., use conductors with a nonspecular finish/sandblasting of conductors to make them less reflective and clean them of manufacturing oils, protect the conductors to minimize scratching and nicking during construction). **If the exceedance occurs during the burn-in period, and if the certificate holder complies with the requirements of this condition, then the certificate holder will not be found to be in violation of its site certificate because of the exceedance.**

ii. If it is determined the corona noise is not typical burn in period noise, the certificate holder will assess whether the noise exceeds the ambient antidegradation standard in a manner not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5. If the complainant's noise sensitive property or properties are included in Attachment X-5 of

the Final Order on the ASC, the modeled sound level increases as presented in Attachment X-4 of the Final Order on the ASC may be relied upon to determine whether the corona noise exceeds the ambient antidegradation standard, unless the complainant voluntarily provides alternative noise data.

iii. If the complainant's NSR property or properties are not included in Attachment X-5 of the Final Order on the ASC, the certificate holder shall model the sound level increases using the methods set forth in ASC Exhibit X, unless the complainant voluntarily provides alternative noise data.

iv. If the complainant voluntarily provides alternative noise data and the data suggests an exceedance that had not previously been identified and mitigated, and/or an exceedance not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5, the complaint shall be verified through site specific sound monitoring conducted by an Oregon registered Professional Engineer, Board Certified by the Institute of Noise Control Engineering noise specialist, employed or contracted by the certificate holder, in accordance with NPCS-1 unless otherwise approved by the Department. If site specific sound monitoring is not authorized by the complainant, the certificate holder's modeling results may be relied upon to determine compliance.

v. In the event of a dispute regarding complainant's noise data and the certificate holder's data from site specific sound monitoring, certificate holder shall request that EFSC, in consultation with the Department's noise consultant, if necessary, make the final determination regarding which data will be used to determine whether corona noise exceeds the ambient antidegradation standard and/or in a manner not allowed under Noise Control Condition 4 or Noise Control Condition 5. The EFSC Chair may direct the Department to make this determination.

f. The plan shall specify that, if it is determined pursuant to the process described in subsection (e) of this condition that corona noise at the complainant's NSR property exceeds the ambient antidegradation standard in a manner not allowed under Noise Control Condition 4 or Noise Control Condition 5, and/or exceeds the ambient antidegradation standard at an NSR property that had not previously been predicted to experience exceedances under Noise Control Condition 1, the certificate holder shall work with the NSR property owner to develop a mutually agreed upon mitigation plan to include agreed upon measures that would be implemented at the NSR location to minimize or mitigate the ambient antidegradation standard noise exceedance. **To be clear, the fact that the certificate holder has received an exception or variance under Noise Control Conditions 4 and 5 does not excuse the certificate holder from providing mitigation under this condition.**

i. If the NSR property was identified in Noise Control Condition 1 and has previously received mitigation by the certificate holder, and if it has been determined that the NSR property experiences exceedances not allowed under Noise Control Condition 4 or Noise Control Condition 5, the certificate holder will work with the complainant to identify supplemental mitigation measures, which may include any of the measures discussed in **Noise Control Condition 1** or the ASC, or other measures requested by the complainant.

ii. If the NSR property was not identified in Noise Control Condition 1 and has not been provided with mitigation by the certificate holder, certificate holder will work with the NSR property owner to identify appropriate mitigation measures, which may include any of the measures discussed in **Noise Control Condition 1** or the ASC, or other measures requested by the landowner.

iii. If, through the efforts described above, the certificate holder executes an agreement with the NSR property owner, the certificate holder will submit a signed acknowledgement from the property owner to the Department for its records. If an agreement between certificate holder and NSR property owner is not obtained, the certificate holder shall concurrently notify the Department and NSR property owner of the dispute and of Council review of the dispute to occur at the next regularly scheduled Council meeting, to the extent possible, from the date of the certificate holder's notice. The notice shall explain that the NSR property owner will be given an opportunity to provide comments to the Council on the dispute, unless the Council defers the dispute review to the Department. Review of the dispute will be based on the information per (iv) below, and any other relevant facts provided by the NSR property owner and will result in a determination of the appropriate mitigation measure(s), proportional to the facility operational noise levels in excess of the ambient degradation standard, as determined to occur at the NSR property. The Council or Department's determination of appropriate mitigation is not binding on the NSR property owner or certificate holder if NSR property owner opts not to accept the mitigation.

iv. At the time of issuance of the notice per (iii) above, certificate holder will submit to the Department: (1) the mitigation measures it offered the NSR property owner, the mitigation measures that the NSR property owner requested and an explanation of the dispute; (2) a list of the dates that the certificate holder communicated with, or attempted to communicate with, the NSR property owners; and (3) the names, addresses, and phone numbers of the NSR owners.

g. The certificate holder shall provide necessary information to the complainant to

support understanding of corona noise, corona noise levels and effects, and of the process to verify actual noise levels of events resulting in complaints. If the complainant opts not to authorize the certificate holder to conduct monitoring, and it is otherwise determined pursuant to the process described in subsection (e) of this condition that corona noise does not exceed the ambient antidegradation standard, the noise complaint shall be considered fully resolved and no mitigation shall be required.

Noise Control Condition 3. Neither the Department nor Idaho Power proposed revisions to Recommended Noise Condition 3. However, STOP B2H has proposed new language clarifying mitigation measures and requiring that Idaho Power “inspect, monitor, and implement necessary maintenance throughout the operational life of the project.” STOP B2H Response at 32. In addition, STOP B2H proposed a new provision requiring that Idaho Power develop a monitoring plan for corona noise on a periodic basis for the life of the project and update noise mitigation measures as new technologies are developed. STOP B2H Response at 32-33.

The Department and Idaho Power contend that these proposed revisions/additions are unnecessary, and the ALJ agrees. Recommended Noise Control Condition 3 already requires Idaho Power to use a triple bundled conductor configuration and to protect the conductor surface to minimize scratching or nicking.²³⁴ Other recommended site certificate conditions (*e.g.*, Recommended Organizational Expertise Condition 1, addressing the Transmission Maintenance Inspection Plan)²³⁵ already require Idaho Power to inspect, monitor, and maintain the facility. Therefore, it is not necessary to add this requirement to Noise Control Condition 3. Furthermore, given the recommended revisions to Noise Control Condition 1 (noise mitigation plans) and Noise Control Condition 2 (noise complaint response plan) discussed above, and considering that exceedances of the antidegradation standard are predicted to occur only infrequently, the ALJ finds it unnecessary to require Idaho Power to monitor for corona noise at key NSRs on a periodic basis for the life of the project. For these reasons, the ALJ declines to adopt STOP B2H’s proposed revisions to Noise Control Condition 3.

Noise Control Condition 4. In its Closing Brief, the Department also proposed revisions to Noise Control Conditions 4 and 5 to clarify terms relating to the granting of the variance and the exception to the ambient antidegradation standard. ODOE Closing Brief at 101-102. In its Response Brief, Idaho Power concurred with the proposed revisions to Noise Control Condition 4 (granting an exception). Idaho Power also agreed the proposed revisions to Noise Control Condition 5 (granting a variance) with the clarification that the Company would not be in violation of the site certificate for exceedances during the burn-in period, as long as the Company is otherwise in compliance with Noise Control Condition 2. Idaho Power Response Brief at 28-29.

Based on the parties’ stipulation, the ALJ recommends that Noise Control Condition 4 be revised to state as follows:

²³⁴ ODOE - B2HAPPDoc2-1 Proposed Order on ASC w Hyperlink Attachments 2019-07-02, page 656 of 699.

²³⁵ *Id.* at page 71 of 699.

Amended Recommended Noise Control Condition 4:

During operation:

a. Pursuant to OAR 340-035-0010, an exception to compliance with the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) (which prohibits an increase of more than 10 dBA above ambient sound pressure levels) is granted during facility operation **when there is foul weather (a rain rate of 0.8 to 5 millimeters per hour), which Council finds constitutes an infrequent event** under OAR 340-035-0035(6)(a).

b. The ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) may be exceeded by the transmission line at any time of day or night during foul weather events **(defined as a rain rate of 0.8 to 5 millimeters per hour)**. [OAR 340-035-0010(2)]

c. The quantity and quality of noise generated in exceedance of the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B), during foul weather events **(defined as a rain rate of 0.8 to 5 millimeters per hour)**, shall not be more than 10 dBA (i.e., ambient plus 20 dBA). [OAR 340-035-0010(2)]

Finally, considering the parties' stipulations and acknowledging Idaho Power's clarification,²³⁶ the ALJ recommends that Noise Control Condition 5 be amended as follows:

Amended Recommended Noise Control Condition 5:

During operation:

a. A variance to compliance with the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) (which prohibits an increase of more than 10 dBA above ambient sound pressure levels) is granted pursuant to OAR 340-035-0100(1) for the transmission line **at any time of day or night during foul weather events (defined as a rain rate of 0.8 to 5 millimeters per hour)**.

b. The quantity and quality of noise generated in exceedance of the ambient antidegradation standard shall not be more than 10 dBA (i.e., ambient plus 20 dBA), as measured at any NSR location.

Public Services Standard: Traffic Safety concerns – Issues PS-1 and PS-6

As pertinent to Issues PS-1 and PS-6, the Public Services Standard requires that Council find that “the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to the ability of public and private providers within

²³⁶ As set out above in Amended Recommended Noise Control Condition 2, the ALJ recommends incorporating into Noise Control Condition 2 the following clarification: “If the exceedance occurs during the burn-in period, and if the certificate holder complies with the requirements of this condition, the certificate holder will not be found to be in violation of its site certificate because of the exceedance.”

the analysis area * * * to provide * * * traffic safety.” OAR 345-022-0110(1).

Issue PS-1: Traffic Safety: Whether Applicant was required to evaluate traffic safety impacts from construction-related use of Morgan Lake Road.

Limited party Susan Badger-Jones has standing on Issue PS-1, and bears the burden of producing evidence to support her claim. Ms. Badger-Jones did not file any written direct testimony or exhibits in support of her position on Issue PS-1, nor did she submit written closing argument regarding this issue. Because Ms. Badger-Jones failed to submit evidence and/or argument in support of her contention that Idaho Power was required to evaluate traffic safety impacts from construction-related use of Morgan Lake Road, the ALJ considers the claim unsubstantiated.²³⁷ The findings in the Proposed Order pertaining to this issue constitute *prima facie* evidence of Idaho Power's compliance with the traffic safety requirements under the Public Services Standard.

Issue PS-6: Whether Applicant adequately evaluated the potential traffic impacts and modifications needed on Hawthorne Drive and Modelaire Drive (the Hawthorne Loop).²³⁸

Limited parties Dale and Virginia Mammen, Joe Horst and Anna Cavinato have standing on Issue PS-6. The limited parties contend that Idaho Power did not adequately evaluate the potential traffic impacts on the paved portion of Hawthorne Drive and Modelaire Drive (the Hawthorne Loop) and the unpaved, privately owned portion of Hawthorne Drive.²³⁹ Specifically, the limited parties contend that Idaho Power's evaluation is inadequate given the roadway characteristics (road widths, grade, curves and blind corners) and the geologic hazards in the area (potentially unstable soils). *See* Horst Closing Statement at 2-6; Mammen Closing Brief at 1-8. In addition, the limited parties assert that Idaho Power's Traffic Plan does not provide adequate safety measures to protect pedestrians and pet animals. *See* Horst Closing Statement at 4-5, 8.

First, it is important to distinguish between the roads comprising the Hawthorne Loop (Modelaire Drive and the paved portion of Hawthorne Drive) and the unpaved, private access portion of Hawthorne Drive. The Hawthorne Loop roads are paved and maintained by the City

²³⁷ Because Issue PS-1 is deemed unsubstantiated, there is no need to address the merits of the claim in this order. *See Ruling on Motion to Dismiss* at 11.

²³⁸ As noted previously, although Issue PS-6, as written, references “the Hawthorne Loop” (*i.e.*, the paved portion of Hawthorne Drive and Modelaire Drive), this issue also includes the limited parties' challenge to Idaho Power's evaluation of traffic impacts on the unpaved, private access portion of Hawthorne Drive.

²³⁹ In his Closing Statement on Issue PS-6, Mr. Horst also challenges Idaho Power's selection of the Mill Creek Route, arguing that the La Grande City Council strongly opposes this proposed route, that Idaho Power did not sufficiently coordinate and consult with the City regarding this route, and that the Company did not provide sufficient site-specific information in the ASC. Horst Closing Statement at 2-4. These arguments fall outside the scope of Issue PS-6. Further, Idaho Power's route selection falls outside Council's jurisdiction.

of La Grande. Although these existing roads may be used to access construction sites, the roads comprising the Hawthorne Loop are outside the site boundary and Idaho Power does not propose any modifications to these roads.

Because the Hawthorne Loop roads are outside the project site boundary, the Council does not have jurisdiction or authority to address the limited parties' claims that these roads will require substantial modification for safety (such as sidewalks) and/or are inadequate for construction vehicle use because of geological hazards. See *In re the Application for a Site Certificate for the Wheatridge Wind Energy Facility*, Final Order, April 28, 2017 at page 7, n. 22 ("It is the Council's responsibility to review, evaluate and issue orders either approving or denying ASCs as put forth by an applicant; the Council does not have authority to propose alternatives[.]"²⁴⁰ *Boardman to Hemingway Transmission Line Proposed Order* at page 51, n. 58 ("The Council does not have jurisdiction over matters that are not included in and governed by the site certificate or amended site certificate."²⁴¹)

Additionally, as to the limited parties' claims that traffic resulting from the construction and operation of the facility presents a safety risk to pedestrians and animals in the Hawthorne Loop neighborhood, Idaho Power's Traffic Plan (required by Recommended Public Services Condition 2) adequately addresses these concerns. Idaho Power proposes using traffic control measures such as pilot vehicles, traffic control flaggers, warning signs, lights, and barriers during construction to ensure safety, minimize localized traffic congestion, and avoid accidents due to limited visibility.²⁴² After final route selection and prior to construction of the transmission line, these safety measures will be fully vetted by the Department, in consultation with Union County and the City of La Grande where applicable.²⁴³

As to the limited parties' concerns regarding the unpaved, privately owned portion of Hawthorne Drive, Idaho Power has shown that substantial modifications (modifications involving repairs to more than 20 percent of the road surface area) may potentially be, but are not likely to be, necessary to support construction vehicle traffic.²⁴⁴ The evidence persuasively

²⁴⁰ See also, *Wheatridge Final Order* at 31:

It is the Council's responsibility to review, evaluate and issue orders either approving or denying ASCs submitted by an applicant. *The Council does not have authority to evaluate structures that are not proposed by the applicant. An amendment to the site certificate would be required if a certificate holder proposes related and supporting facilities to the energy facility not included in or evaluated in the ASC.*

Emphasis added.

²⁴¹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 58 of 10016.

²⁴² Grebe Rebuttal Test. at 38.

²⁴³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 8460 of 10016 (Road Classification Guide and Access Control Plan at 10).

²⁴⁴ Grebe Rebuttal Test. at 39.

establishes that the width, slope and curves of this gravel road are within typical construction vehicle parameters,²⁴⁵ and therefore it is unlikely that substantial modifications such as widening the road or reinforcing the slope will be necessary. The road meets the minimum requirements for width and turning surface, and does not exceed the maximum grade for construction vehicles.²⁴⁶ Idaho Power determined that this portion of roadway would likely need non-substantial maintenance activities such as blading to maintain the surface and water to mitigate dust emissions,²⁴⁷ but not substantial modification. Furthermore, if necessary to avoid tight turning conditions and possible traffic congestion issues, Idaho Power could and likely would air-lift materials and equipment by helicopter.²⁴⁸

As noted above, Idaho Power's Traffic Plan (required by Recommended Public Services Condition 2) adequately addresses traffic safety concerns. Idaho Power's proposal to use traffic control measures such as pilot vehicles, traffic control flaggers, warning signs, lights, and barriers during construction is completely appropriate and reasonable to protect other traffic, pedestrians and pets. Finally, if it is later determined that the roadway needs substantial modification in connection with the proposed facility construction or operation because of potential geologic hazards in the area, Idaho Power has committed to protect public safety. Idaho Power will, prior to construction or road modification, complete appropriate engineering due diligence and consult with a licensed civil engineer to ensure that the design of the road modification accounts for these potential hazards and protects the public.²⁴⁹

In summary, the preponderance of the evidence establishes that Idaho Power adequately evaluated the potential traffic impacts and modifications needed on the Hawthorne Loop as well as the unpaved, private-access portion of Hawthorne Drive. The limited parties have failed to provide persuasive evidence or testimony supporting their claims.

Proposed site certificate conditions related to Issue PS-6:

In their Closing Argument, the Mammens propose a cite certificate requiring Idaho Power to "complete engineering due diligence before moving forward with any construction" in the Hawthorne Loop/Hawthorne Drive area. Mammens Closing Argument at 8-9. The Mammens did not submit this proposed condition in a timely manner in accordance with the schedule set in the *Case Management Order*.

Notwithstanding the untimeliness of the proposed condition, Idaho Power has, as discussed above, agreed that, prior to construction or road modification in a geologic hazard

²⁴⁵ Grebe Rebuttal Test. at 39-41.

²⁴⁶ *Id.* at 26-29; *see also* Grebe Rebuttal Exs. B and D.

²⁴⁷ Grebe Rebuttal Test. at 27, 32, 41.

²⁴⁸ Grebe Rebuttal Test. at 26-27.

²⁴⁹ Grebe Rebuttal Test. at 42.

zone, it will consult with a licensed civil engineer to assess the proposed construction or road design in relation to potential geologic hazards.²⁵⁰ In its Response Brief on Issue PS-6, Idaho Power also proposed a new Public Services Condition to formalize this agreement:

Prior to construction or road modification in any area designated as a geologic hazard zone by Oregon Department of Geology and Mineral Industries (DOGAMI) data and maps (e.g., as landslide or debris flow fan), or by relevant local zoning ordinances and maps, the site certificate holder and/or its construction contractors will consult with a licensed civil engineer to assess the proposed construction or road design in relation to potential geologic hazards.

Idaho Power's Response Brief and Motion to Strike for Contested Case Issues PS-1 and PS-6 at 22.

Ruling on Idaho Power's Motion to Strike portions of the Mammens' Closing Argument:

In its Response Brief for Issue PS-6, Idaho Power moves to strike, or in the alternative give no weight to, the portions of the Mammens' Closing Argument that reference or rely upon Mammens Exhibit 5, as this document was excluded from the evidentiary record pursuant to the *Rulings on Objections to Direct Testimony and Exhibits*, issued October 15, 2021.²⁵¹ The ALJ acknowledges that Mammens Exhibit 5 is not part of the evidentiary record,²⁵² and that the Mammens' concerns about slope instability in the Hawthorne Loop area are not directly relevant to Issue PS-6, which focuses on the evaluation of potential traffic impacts in that area. While the ALJ finds it inefficient and unnecessary to strike the challenged portions of the Mammens' Closing Argument referencing or relying upon Mammens Exhibit 5, these statements are not material to this issue. Therefore, the ALJ grants Idaho Power's alternative request and gives these statements no evidentiary weight.

Idaho Power also moves to strike portions of the Mammens' Closing Arguments that reference and rely on a June 22, 2021 letter from Scott Hartell, Union County Planning Director, because this document is not part of the evidentiary record.²⁵³ For the reasons stated above, the ALJ declines to strike this portion of the Mammens' brief. However, because the statements are not pertinent to the resolution of Issue PS-6 they have no evidentiary weight in this context.

²⁵⁰ Grebe Rebuttal Test. at 42-43.

²⁵¹ Mammens Exhibit 5 is a June 2021 study/report by Barlow Environmental Consulting and a letter dated October 8, 2018 from Mark Stokes to the La Grande City Manager and others. In the *Rulings on Objections to Direct Testimony and Exhibits*, the ALJ found that these documents were not relevant or material to Issue PS-6 and excluded them from the evidentiary record.

²⁵² As set out in Appendix 2, Mammens Exhibit 5 is, however, part of the administrative record as a document submitted in opposition to Idaho Power's Motion for Summary Determination on Issue SS-4.

²⁵³ As set out in Appendix 2, this letter is part of the administrative record as Mammens Response Exhibit 3, a document submitted in opposition to Idaho Power's Motion for Summary Determination on Issue SS-4.

Ruling on Idaho Power's Motion to Strike portions of Mr. Horst's Closing Argument:

Idaho Power also moves to strike a statement in Mr. Horst's closing brief asserting that the project does not help Oregonians' energy supply as unsupported and outside the scope of Issue PS-6. While the ALJ declines to strike this statement for logistical reasons, the claim is unsupported, outside the scope of Issue PS-6, and entitled to no weight.

Ruling on Idaho Power's Motion to Strike Portions of Mr. Horst's Response Brief regarding Issue PS-6:

In the motion, Idaho Power moves to strike, or in the alternative give no weight to, statements in Mr. Horst's Response Brief pertaining to granting Idaho Power access to his property as unsupported by evidence in the record. Motion at 11. The ALJ agrees that this portion of Mr. Horst's brief is testimonial in nature, unsupported by evidence in the record, and not material to Issue PS-6. Therefore, the challenged statements are given no weight.

Public Services Standard: Fire Protection concerns – Issues PS-2, PS-3, PS-4, PS-5, PS-8, PS-9 and PS-10

As pertinent to Idaho Power's Issues PS-8 and PS-9, and limited parties' Issues PS-2, PS-3, PS-4, PS-5, and PS-10, the Public Services Standard requires that Council find that "the construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to the ability of public and private providers within the analysis area * * * to provide * * * fire protection." OAR 345-022-0110(1).

Applicant's Issues – Issues PS-8 and PS-9

Issue PS-8: Whether Department-proposed revisions to Public Services Condition 7 are redundant with Attachment U-3 and existing condition requirements.

Idaho Power raised this issue to clarify certain provisions of Recommended Public Services Condition 7, which requires the Company provide its Wildfire Mitigation Plan to the Department and affected counties prior to and annually during facility operations. Idaho Power contends that some of the language in the recommended condition is redundant. As set out in the Proposed Order, Recommended Public Services Condition 7(a) requires that the Wildfire Mitigation Plan "address facility and emergency contacts, agency coordination and responsibilities, necessary fire-fighting equipment, and long-term agreements with service providers, as needed."²⁵⁴ However, these same requirements are already addressed elsewhere in Recommended Public Services Condition 7 and in the draft FPS Plan. Recommended Public Services Condition 7(c) requires Idaho Power to "provide to each of the fire districts and rural fire protection a contact phone number to call in the event a district needs to request an outage as part of a fire response."²⁵⁵ Section 1.4 of the draft FPS Plan addresses agency coordination and

²⁵⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 590 of 10016,

²⁵⁵ *Id.*

responsibilities, necessary fire-fighting equipment, and long-term agreements with service providers.²⁵⁶ Idaho Power proposed revisions to Recommended Public Services Condition 7, specifically deletion of the last sentence of paragraph 7(a) to address these redundancies.

The Department agrees that the challenged portion of Recommended Public Services Condition 7 is redundant of other provisions and therefore should be removed.²⁵⁷ Given the parties' stipulation on this issue, the ALJ finds a preponderance of the evidence supports removal of the redundant language (the second sentence of paragraph 7(a)) from Department Recommended Public Services Condition 7. Consequently, in the final order, Public Services Condition 7 should state as follows:

Amended Recommended Public Services Condition 7: The certificate holder shall:

- a. Prior to operation, provide a copy of its Wildfire Mitigation Plan to the Department and each affected county which provides a wildfire risk assessment and establishes action and preventative measures based on the assessed operational risk from and of wildfire in each county affected by the facility.
- b. During operation, the certificate holder shall update the Wildfire Mitigation Plan on an annual basis, or frequency determined acceptable by the Department in consultation with the Oregon Public Utilities Commission.
- c. During operation, for the service territories the facility would be located within, the certificate holder shall provide to each of the fire districts and rural fire protection a contact phone number to call in the event a district needs to request an outage as part of a fire response.
- d. Any Wildfire Mitigation Plan required by the Oregon Public Utilities Commission shall be considered by EFSC as meeting the requirements of this condition.

Issue PS-9: Whether Department-proposed revisions to the Fire Prevention and Suppression Plan (Public Services Condition 6, Proposed Order Attachment U-3) incorrectly reference applicability to facility operations.

Idaho Power raised Issue PS-9 in response to revisions the Department made to the draft FPS Plan in the Proposed Order. In the Proposed Order, the Department added Section 1.4, Fire Response Agreements, to the draft FPS Plan. This new section requires that Idaho Power attempt to negotiate agreements with relevant fire response organizations or federal agencies outlining communication and response procedures for potential fires within their boundaries during facility construction and operation. While Idaho Power agrees that this requirement is

²⁵⁶ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9780 of 10016.

²⁵⁷ ODOE Rebuttal to Direct Testimony, Evidence and Response to Proposed Site Certificate Conditions at 89; ODOE Closing Brief at 135.

appropriate during the construction phase of the project, the Company disagrees that the same obligations should apply during operation, because the risk of fire is much lower and Idaho Power will generally not have personnel on site to respond to a fire more quickly than fire response organizations in the area. Idaho Power proposed revisions to Section 1.4 of the draft FPS Plan to address the Company's concern.

In light of the persuasive expert testimony explaining that a 500 kV transmission line is unlikely to cause wildfires and therefore the risk of a project-related fire during operation is very low, the Department agreed with Idaho Power's proposed revisions to Section 1.4 of the draft FPS Plan. The Department agreed that the actions Idaho Power will take to ensure fire protection in areas outside designated fire districts, along with the low risk of a project-related fire during operation, were sufficient to ensure that the project would not result in a significant adverse impact to the ability to provide fire protection services within the analysis area.²⁵⁸ The Department also recommended a revision to Recommended Public Services Condition 6 to clarify that the condition and the FPS Plan apply during construction and operation of the proposed facility.²⁵⁹ Idaho Power agrees with this recommendation.

Given the parties' stipulation, the ALJ finds a preponderance of the evidence supports Idaho Power's proposed revisions to Section 1.4 of the draft FPS Plan and the Department's proposed revision to Public Services Condition 6. Accordingly, Section 1.4 of the draft FPS Plan should state as follows (revisions in bold):

1.4 Fire Response Agreements

In areas not covered by a fire response organization or located on federal land, the certificate holder will attempt to negotiate an agreement with the relevant fire response organization or federal agencies as presented in Table 2 above, outlining communication and response procedures for potential fires within their boundaries during facility construction and operation. In those areas not covered by a fire response organization and not located on federal land, the certificate holder will attempt to negotiate an agreement with nearby fire response organizations or the federal agencies to provide fire response. If no such agreements can be reached **during construction**, the certificate holder will propose alternatives such as contracting with a private fire response company or providing additional firefighting equipment at those sites. **If no such agreements can be reached during operation, the certificate holder will consult with the local dispatch centers and report to the ODOE the dispatch center's procedures for responding to wildfires in those areas without fire district coverage.** The certificate holder shall provide documentation to the Oregon

²⁵⁸ ODOE Rebuttal to Direct Testimony, Evidence and Response to Proposed Site Certificate Conditions at 97; ODOE Closing Brief at 136.

²⁵⁹ The Department recommended the following revision (in bold) to paragraph 6(c): All work must be conducted in compliance with the approved plan during construction **and operation, as applicable**, of the facility. ODOE Rebuttal at 98; ODOE Closing Brief at 137.

Department of Energy, demonstrating the final agreements or alternative contract agreements for fire response, or dispatch center procedures as applicable.

Furthermore, Public Services Condition 6, paragraph 6(c) should be revised as follows (revisions in bold):²⁶⁰

c. All work must be conducted in compliance with the approved plan during construction **and operation, as applicable**, of the facility.

Limited parties' Fire Protection Issues – Issues PS-2, PS-3, PS-4, PS-5 and PS-10

Issue PS-2: Fire Protection: Whether the site certificate should require that the public have the opportunity to review and comment on the final Wildfire Mitigation Plan; whether the Wildfire Mitigation Plan should include remote cameras to detect wildfire, safety procedures during red flag conditions, and the requirement that firefighting equipment be present on-site during construction.

Limited parties Miller and Carbiener, acting in both his personal capacity and as a representative of OCTA, and have standing on Issue PS-2. Mr. Carbiener filed direct testimony on this issue, combined with Issue PS-3. Neither Ms. Miller nor Mr. Carbiener filed closing briefs. In his direct testimony, Mr. Carbiener argues that Idaho Power has not been aggressive in its proposed wildfire prevention plans and have not incorporated remote cameras or weather stations in its Wildfire Mitigation Plan. Carbiener Direct Test. at 5. Mr. Carbiener does address the claim regarding public review and comment on the Wildfire Mitigation Plan in his testimony.

Idaho Power developed its Wildfire Mitigation Plan to comply with Public Utility Commission rules, not the Council's siting rules.²⁶¹ As both the Department and Idaho Power note, no applicable statute or rule requires Idaho Power to submit its Wildfire Mitigation Plan for public review and comment as part of the Council's ASC review process. Therefore, there is no need for a site certificate condition requiring such a process. ORS 469.402 authorizes the Council to delegate the approval of a future action and plan finalization to the Department. Furthermore, OAR 345-025-0016 requires that a certificate holder develop proposed monitoring and mitigation plans in consultation with the Department and, as appropriate, other state agencies, local governments and tribes. Consistent with those requirements, Recommended Public Services Condition requires Idaho Power to submit the Wildfire Mitigation Plan to the Department and the affected counties.²⁶² Although Idaho Power is also required to submit the

²⁶⁰ As discussed *infra* under Issue PS-4, the Department proposed additional amendments to Recommended Public Services Condition 6 to inform the scope of review during the agency finalization process of the FPS Plan.

²⁶¹ Dockter Direct Test. at 2-3. As set out in the findings, the primary objectives of the Wildfire Mitigation Plan are to identify and implement strategies that reduce wildfire risk associated with Idaho Power's transmission and distribution facilities and improve Idaho Power's transmission and distribution system's resiliency to any wildfire event, independent of the fire's ignition source. Dockter Direct Ex. A at. 11.

²⁶² See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 590 of 10016.

Plan to the OPUC for approval under ORS 757.963, that process falls outside the Council's jurisdiction.

As to the second part of Issue PS-2, Mr. Carbiener has presented no evidence or persuasive legal argument in support of his contention that the Wildfire Mitigation Plan should include provisions requiring the installation of cameras, firefighting equipment on-site during construction and/or specific safety procedures during red flag conditions. Furthermore, as discussed in the findings, Idaho Power's 2022 Wildfire Mitigation Plan specifically addresses Red Flag Warnings as a consideration in the PSPS Plan. If the Company determines a combination of critical conditions indicate the transmission and distribution system at certain locations is at an extreme risk of being an ignition source and wildfire conditions are severe enough for the rapid growth and spread of wildfire, then it will initiate a power shutoff plan.²⁶³

In summary, there is no requirement under the Council's review process that the public have the opportunity to review and comment on the final Wildfire Mitigation Plan. Furthermore, there is no requirement under the Council's rules that the Wildfire Mitigation Plan include specific fire protection or fire suppression tools, such as remote cameras, a shut off plan, and on-site firefighting equipment and personnel during construction. As the Department notes in its Closing Arguments, the evidence in the record coupled with the recommended conditions in the Proposed Order requiring finalization and implementation of the FPS Plan, the Vegetation Management Plan, the Right of Way Clearing Assessment, and the Wildfire Mitigation Plan provide a preponderance of evidence to support a Council finding of compliance with OAR 345-022-0110.²⁶⁴

Proposed site certificate conditions related to Issues PS-2 and PS-3:

In his direct testimony, Mr. Carbiener timely proposed two site certificate conditions related to Issues PS-2 and PS-3.

Carbiener Proposed Fire Protection Condition 1: Prior to the start of construction, Idaho Power will complete any Wildfire Prevention Plan or Wildfire Mitigation Plan even if the Public Utilities Commission has not yet developed their plan requirements. If OPUC rules are completed, then Idaho Power must obtain acknowledgement from OPUC that they are acceptable.

Both the Department and Idaho Power oppose this condition as unnecessary. The ALJ agrees. First, since Mr. Carbiener proposed this condition on September 1, 2021, Idaho Power has submitted both its 2021 and 2022 Wildfire Mitigation Plans into the contested case record. Second, as noted above, the recommended conditions in the Proposed Order require Idaho Power to finalize and implement its FPS Plan, Vegetation Management Plan, Right of Way Clearing Assessment, and Wildfire Mitigation Plan, which will further minimize the risk of a project-related fire and the potential impacts to public and private fire protection providers under OAR

²⁶³ Dockter Sur-surrebuttal Test., Ex. B at 75.

²⁶⁴ See ODOE Closing Brief at 121. See also ODOE Response Brief at 91.

345-022-0110. Therefore, this proposed condition is denied.

Carbiener Proposed Fire Protection Condition 2: Prior to the start of Operation (2026), Idaho Power will conduct and publish for all to know, an analysis of their potential investment in cameras and weather stations and other preventive wildfire solutions.

Both the Department and Idaho Power also oppose this condition as unnecessary. Again, the ALJ agrees. First, as discussed above, Mr. Carbiener has provided no persuasive evidence or argument to establish why an applicant must invest in cameras, weather stations, and other preventive wildfire solutions to establish compliance with the Public Services standard. Furthermore, while in the future OPUC may require utilities to include such information in their Wildfire Mitigation Plans, that requirement is a matter outside the scope of the Council's ASC review. Accordingly, this proposed condition is denied.

Issue PS-3: Fire Protection: Whether Council's reliance on the Wildfire Mitigation Plan (Public Services Condition 7) prepared by Applicant for the Oregon Public Utility Commission (OPUC) is adequate to address wildfire response consistent with the Public Services standard.

As with Issue PS-2 above, limited parties Miller and Carbiener, acting in both his personal capacity and as a representative of OCTA, have standing on Issue PS-3. Mr. Carbiener filed direct testimony on this issue. Neither limited party filed closing briefs. In his direct testimony, Mr. Carbiener notes, "it appears the OPUC plans will be general in nature and not specific to B2H." Carbiener Direct Test. Issues PS-2 and PS-3 at 4. He also challenged the fact that, in an OPUC meeting, Idaho Power only identified two areas along the project route as potential fire risk. *Id.* at 3.

As the Department notes in its brief on Issue PS-3, the Public Services standard is not a wildfire or risk assessment standard. It is a standard that evaluates whether the level of demand for services by a proposed facility would significantly impact service providers' ability to continue providing their services. For fire protection service providers, the standard involves an assessment of whether the proposed facility is located within the fire service provider's service territory and whether the proposed facility would significantly impact the provider's level of service (demand) and resources (employees, volunteers and equipment) in the event fire protection services are required during facility construction and operation.

A Wildfire Mitigation Plan is not an essential element of compliance with the Public Services standard. To the extent that Idaho Power's Wildfire Mitigation Plan (which, as discussed above, was developed to satisfy OPUC rules), reduces the proposed facility's potential to cause or contribute to the spread of a wildfire, this reduced potential can be applied to the potential resource demand of the proposed facility under the Public Services standard. However, whether the Wildfire Mitigation Plan is adequate to address wildfire response is not relevant to the Council's determination of whether the proposed facility complies with the Public Services standard.

Mr. Carbiener is correct that the Wildfire Mitigation Plan is general and nature and not specific to the project (although the 2022 Plan discussed the wildfire risk along the proposed project route). However, that is because the Plan's objective is to reduce wildfire risk for Idaho Power's entire transmission and distribution system, and not just the proposed project. For purposes of the proposed project, the evidence in the record, coupled with the recommended conditions requiring implementation of the FPS Plan, the Vegetation Management Plan, the Right of Way Clearing Assessment and Wildfire Mitigation Plan provide a preponderance of evidence to support a Council finding of compliance with the Public Services standard. In other words, the Council may rely on Public Services Condition 7 and the OPUC-approved Wildfire Mitigation Plan, along with conditions requiring implementation of other mitigation and management plans, to find that that construction and operation of the facility are not likely to result in significant adverse impact to fire protection services within the analysis area.

Issue PS-4: Fire Protection: Whether Applicant adequately analyzed the risk of wildfire arising out of operation of the proposed facility and the ability of local firefighting service providers to respond to fires.

Limited parties Cooper and Winters have standing on Issue PS-4. Mr. Cooper filed testimony and argument in support of his position on this issue. Mr. Winters did not submit either. Mr. Cooper contends that Idaho Power did not adequately analyze the risk of a project-related wildfire and that the Company seriously understated the response times of local fire protection agencies to respond to a project-related fire, especially the ability of the La Grande Rural Fire Protection District (LGRFPD) to respond to such a fire. Cooper Closing Brief on Issue PS-4; Cooper Response Brief on Issue PS-4.

Idaho Power responds that it has adequately analyzed the risk of wildfire during operation of the facility and has presented substantial evidence establishing that the risk of a project-related fire is extremely low. Idaho Power also asserts that it has adequately analyzed the response capabilities of fire response organizations near the project site. The Department agrees that Idaho Power adequately analyzed the risk of a project-related wildfire and that the proposed facility is not likely to result in a significant adverse impact to public and private firefighters' ability to provide fire protection service. However, to address concerns about the accuracy of the response time information presented in ASC Exhibit U, Table U-10, the Department recommended amendments to Recommended Public Services Condition 6. ODOE Rebuttal to Direct Testimony at 84; ODOE Closing Brief at 127; ODOE Response Brief at 98.

Risk of project-related fire. Mr. Cooper argues that Idaho Power has not established compliance with OAR 345-022-0110 because: (1) 500 kV transmission lines can ignite, and have ignited, fires; (2) the La Grande area in Union County has a history of catastrophic fires; and (3) the winds, weather conditions, topography, and vegetation in the region already pose a significant fire threat, which the proposed facility will only exacerbate.²⁶⁵ Cooper Closing Brief

²⁶⁵ To the extent Mr. Cooper argues that portions of the transmission line should be buried underground (see, e.g., Cooper Closing Brief on Issue PS-4 at 2, 26-27; Cooper Response Brief on Issue PS-4 at 10), the argument falls outside the scope of Issue PS-4 and outside of the Council's jurisdiction. This is because the Council does not have the authority to evaluate structures and alternative routes that are not

on Issue PS-4 at 1-15. For the reasons that follow, Mr. Cooper's challenges are not persuasive.

First, it is important to note that Idaho Power does not need to prove that the proposed facility cannot or will not cause a fire. Rather, to demonstrate compliance with the Public Services standard, the Company needs to show by a preponderance of the evidence that the proposed facility is not likely to result in a significant adverse impact to public and private firefighters' ability to provide fire protection service. OAR 345-022-0110(1). On this record, Idaho Power has provided substantial evidence demonstrating that 500 kV transmission lines are much less likely to ignite fires than lower voltage lines.²⁶⁶ Idaho Power has also shown that the winds, weather conditions, topography, and vegetation along the project route (including the Mill Creek and Morgan Lake Alternative segments) do not significantly increase the risk of a large, project-related wildfire.²⁶⁷ The persuasive evidence establishes that although fires are not uncommon in the project area, the fire protection agencies are able to contain the fires quickly, while they are still small.²⁶⁸ Moreover, the FSP Plan, the Right of Way Clearing Assessment, and the Vegetation Management Plan all include measures the Company will take to minimize the risk of project-related fires.

The fire history data for the project area demonstrates that, although fires occur in the area frequently, the fire protection agencies are able to contain those fires at small sizes. The fact that there has been two large wildfires near La Grande in the last 150 years (one in 1858 and the Rooster Peak fire in 1973), is not an adequate predictor of the likelihood of a large project-related fire in the future. Putting aside the very low probability of the proposed facility igniting a fire in Union County or elsewhere along the route, both fire prevention measures and firefighting capabilities have improved over the past 50 years. Indeed, there is now an aerial firefighting dispatch center located at the La Grande Airport.²⁶⁹ Mr. Cooper has not overcome the persuasive evidence demonstrating that the proposed facility is not likely to result in a significant adverse impact public and private firefighters' ability to provide fire protection service.

Local agency response times. As noted above, Mr. Cooper maintains that Idaho Power understated the response times of local fire agencies in general, and in particular the response time of the LGRFPD. Mr. Cooper asserts that it would take the LGRFPD significantly longer than four to eight minutes to respond to a fire in the area Morgan Lake Park, because of the time needed to muster a crew and the travel time to the area. Cooper Closing Brief at 15-18; Cooper Response Brief at 8-9.

Although Mr. Cooper is correct that it would likely take the LGRFPD more than four to

included in, and governed by, the site certificate application. *See In re the Application for a Site Certificate for the Wheatridge Wind Energy Facility*, Final Order, April 28, 2017, page 7 n.22.

²⁶⁶ Lautenberger Direct Test. at 54; Lautenberger Rebuttal Test. at 58-62.

²⁶⁷ Lautenberger Rebuttal Test. at 25-27.

²⁶⁸ Lautenberger Rebuttal Test. at 25-27.

²⁶⁹ Dockter Sur-surrebuttal Exhibit B; Dockter Cross-Exam. Test., Tr. Day 3 at 17.

eight minutes to respond to a fire near Morgan Lake, that does not change the analysis of the proposed facility's compliance with OAR 345-022-0110(1). In ASC Exhibit U, Idaho Power acknowledged that response times to fires in the analysis area will vary depending on the time of day, the priority of the emergency/call and the location of the emergency and the type of available access.²⁷⁰ In ASC Exhibit U, Table U-10, Idaho Power provided a response time of four to eight minutes for the LGRFPD based on information provided by the LGRFPD. At the time LGRFPD provided this information (in 2017), neither Morgan Lake Park nor surrounding properties were within the district's protection jurisdiction.²⁷¹

Furthermore, although LGRFPD has since added several properties in the vicinity of Morgan Lake to its protection area, the fact remains that the LGRFPD has mutual aid agreements with both the City of La Grande and the ODF. The City and the ODF are primarily responsible for the Morgan Lake area. They are located closer to Morgan Lake than the LGRFPD and would likely respond more quickly to the area than the LGRFPD.²⁷² Moreover, in the event of a large wildfire in the Morgan Lake area, there are other resources, including aerial resources, available to deploy to combat the fire.²⁷³

In summary, a preponderance of the evidence establishes that Idaho Power adequately analyzed both the risk of wildfire arising out of operation of the proposed facility and the ability of local firefighting service providers to respond to fires in or near the project area. Mr. Cooper has not demonstrated otherwise.

Proposed site certificate conditions related to Issue PS-4:

In his direct testimony for Issue PS-4, Mr. Cooper timely proposed a fire protection site certificate condition. He requested that the line be "undergrounded through all five counties in Oregon, since they are categorized as Fire Weather Hazard 3." Cooper Direct Test. Issue PS-4 at 16. This proposed condition is inappropriate because it falls outside the Council's jurisdiction. Idaho Power did not propose an underground transmission line and the Council cannot require that the project be constructed underground. Therefore, this proposed condition is denied.

In his closing brief for Issue PS-4, Mr. Cooper proposes additional site certificate conditions, including a request that Idaho Power "fully fund a Multi-Agency Fire and Emergency Response Station to be located at the Baker City Municipal Airport." Council rejects Mr. Cooper's proposed condition as unnecessary and outside the Council's jurisdiction. Council does not have the authority to require, wholesale, that an applicant such as Idaho Power provide compensation and or funding to create a fire and response station in order to satisfy the Public Services standard. This proposed condition is neither appropriate or necessary.

As noted above, the Department recommended amending Recommended Public Services Condition 6 to address concerns about the accuracy of the response time information presented in

²⁷⁰ ODOE - B2HAPPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 20 of 143.

²⁷¹ Kretschmer Dep. at 6-8, 31, 40, Cooper Direct Ex. 6.

²⁷² Dockter Cross-Exam. Test., Tr. Day 3 at 17.

²⁷³ *Id.*

ASC Exhibit U, Table U-10. Specifically, the Department recommended adding a provision requiring Idaho Power to:

Identify specific seasonal work restrictions, onsite fire-fighting equipment and necessary fire protection resources based on: 1) documented evaluation of reasonably available sources related to wildfire risk and sensitive seasonal conditions such as high temperatures, drought and high winds; and, 2) updated information obtained from the LGRFPD on the number of full-time and volunteer employees, number and type of equipment/vehicles, and response times to the facility. Response time must consider LGRFPD crew mobilization time and access limitations (e.g., road condition, level of service and impact of multi-users from Morgan Lake Park, residents and emergency services).

ODOE Closing Brief at 127.

Idaho Power maintains this revision to Recommended Public Services Condition 6 is not necessary because the seasonal work restrictions, onsite fighting equipment, and fire protection considerations are already addressed in the FPS Plan. Idaho Power notes that Section 2.2 of the draft FPS Plan requires the Company to restrict construction operations in specified locations during fire season at the direction of a land-management agency. Idaho Power also notes that it already identified the firefighting equipment it will keep onsite during construction and will coordinate with land-management agencies to implement any additional measures required to allow construction to continue. In addition, Idaho Power asserts that additional fire prevention measures based on fire protection districts' response times is unnecessary because the Company's FPS Plan, including the requirement to take additional precautions during periods of high fire risk, will adequately address the potential fire risk, thereby ensuring that the project does not result in a significant adverse impact to the ability of public and private providers to provide fire protection. Idaho Power Closing Argument at 43-46; Idaho Power Response Brief at 30-31.

In its Response to Closing Arguments, the Department notes that the Public Services standard is neither a risk assessment nor wildfire mitigation standard. The purpose and legal parameters of the Public Services standard is to evaluate the proposed facility's demand on existing service capacity, and not forecast the project's potential demand based on wildlife risk assessment. Upon considering Idaho Power's objections to the proposed amendments to Recommended Public Services Condition 6, the Department acknowledged that Idaho Power's contentions have merit. The Department agreed that land-management agencies such as the ODF and/or the BLM must be given deference during the finalization of the Company's FPS Plan as to the factors that should be considered, work restrictions and process for establishing high-fire risk/no-work days and type of fire-fighting equipment that Idaho Power should have onsite during construction. ODOE Response to Closing Arguments at 95-97.

The Department proposed further revisions to Recommended Public Services Condition 6 to clarify its position regarding the scope of review during finalization of the FPS Plan. The Department proposed clarifying language to allow consideration of the listed factors, while also allowing flexibility for the land management agencies that participate in the finalization process

to weigh in and determine the factors to be addressed in the FPS Plan, particularly in the lands the agencies manage. The Department proposed a Second Amended Recommended Public Services Condition 6 as follows (revisions in bold):

Second Amended Recommended Public Services Condition 6: Prior to construction of a facility phase or segment, in accordance with the OAR 345-025-0016 agency consultation process outlined in the plan (Attachment U-3 of the Final Order on the ASC), the certificate holder shall submit final Fire Prevention and Suppression Plan(s) to the Department. **The plan finalization process shall consider (a)(i) and (a)(ii) unless otherwise identified by a land management agency or other participating review agency:**

a) The protective measures as described in the draft Fire Prevention and Suppression Plan as provided in Attachment U-3 of the Final Order on the ASC **and:**

i. Wildfire training for onsite workers and facility personnel be conducted by individuals that are National Wildfire Coordination Group and Federal Emergency Management Agency certified.

ii. **Specific seasonal work restrictions, onsite fire-fighting equipment and necessary fire protection resources based on: 1) documented evaluation of reasonably available sources related to wildfire risk and sensitive seasonal conditions such as high temperatures, drought and high winds; and 2) update Table PS-9 of the Proposed Order based on information obtained from the LGRFPD on the number of full-time and volunteer employees, number and type of equipment/vehicles, and response times to the facility. Response time must consider LGRFPD crew mobilization time and access limitations (e.g., road condition, level of service and impact of multi-users from Morgan Lake Park, residents and emergency services).**

b) A description of the fire districts and rural fire protection districts that will provide emergency response services during construction and copies of any agreements between the certificate holder and the districts related to that coverage.

c) All work must be conducted in compliance with the approved plan during construction **and operation** of the facility.

The ALJ finds the Department's proposed revisions to Recommended Public Services Condition are necessary and appropriate to meet the requirements of the Public Services standard. Therefore, the ALJ recommends that, in the Final Order, the Council modify this condition accordingly.

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Ruling Mr. Cooper's Motion to Strike Portions of Idaho Power's Response Brief on Issue PS-4:

Following receipt of Idaho Power's Response Brief, Mr. Cooper moved to strike the following assertion in Idaho Power's brief: "Mr. Cooper's testimony demonstrates that firefighters in La Grande had to rely on bucket brigades to fight the Rooster Peak Fire."²⁷⁴ Cooper Motion to Strike at 1. Mr. Cooper asserts that this assertion is false, or at the very least misleading, because the evidence actually demonstrates that in 1973, firefighters used a variety of measures, including helicopters and air tanker drops, to combat the Rooster Peak Fire. *Id.* at 1-2.

The ALJ declines to strike the statement from Idaho Power's brief. The ALJ notes, however, the evidence shows that about 300 firefighters fought the lightning-caused Rooster Peak fire with the assistance of approximately 1500 community volunteers, and using a variety of fire suppression measures, including bucket brigades, digging fire lines, helicopter water drops, and airplane flame retardant drops.²⁷⁵ Consequently, to the extent Idaho Power's argument suggests that firefighters had to rely solely on bucket brigades to fight the 1973 fire, the contention is given no weight.

Issue PS-5: Fire Protection: Whether the Wildfire Mitigation Plan is adequately developed and includes sufficient detail to allow for public participation.

Ms. Gilbert has standing on Issue PS-5, and bears the burden of producing evidence to support her challenges to the Wildfire Mitigation Plan. Ms. Gilbert did not timely file any written direct testimony or exhibits in support of her position on Issue PS-5, nor did she submit written closing argument on this issue. Because Ms. Gilbert failed to submit evidence and/or argument in support of her claim, the ALJ considers the claim unsubstantiated.²⁷⁶ The findings in the Proposed Order constitute *prima facie* evidence of Idaho Power's compliance with the Public Service standard as it relates to Issue PS-5.

Issue PS-10: Whether the draft Fire Prevention and Suppression Plan (Attachment U-3) is adequate and whether local service providers would be able to respond to a facility-related fire.

Limited parties Charles Lyons and Stacia Webster have standing on Issue PS-10. In his direct testimony, Mr. Lyons argues that the FPS Plan is inadequate because Idaho Power seriously underestimates the risk of fires caused by 500 kV transmission lines in the Blue Mountain and Morgan Lake Alternative segments of the proposed facility. Lyons Direct Test. at

²⁷⁴ Idaho Power's Response Brief for Issue PS-4 at 15, citing Cooper Direct Test. Issue PS-4 at 6.

²⁷⁵ See, e.g., Cooper Direct Test. at 3-6; Cooper Direct Ex. 3.

²⁷⁶ See *Ruling on Motion to Dismiss* at 12-13 ("absent timely filed written closing argument from Ms. Gilbert, the ALJ will consider the claim asserted as unsubstantiated, and will not address the merits of Issue PS-5 in the Proposed Contested Case Order.").

2-4. Mr. Lyons also contends the draft PPS Plan lacks clear criteria for emergency de-energizing the proposed line, that it fails to mitigate fire danger by burying portion of the line, and that it does not provide specific information about points of access for firefighters along the route nor contingency plans for emergencies when resources are scarce.²⁷⁷ *Id.* at 5-6.

In her testimony, Ms. Webster offers evidence of the 1973 Rooster Peak wildfire in the forested mountains west of La Grande. Ms. Webster argues that the draft FPS Plan misstates local fire protection agencies' ability to respond to a project-related fire and the estimated response times. Webster Direct Test. at 3-6. Ms. Webster also contends that the draft FPS Plan should incorporate an amended version of Proposed Order Table PS-9, setting out the fire protection agencies and associations within the analysis area and accurate estimates of the agencies' response times to a project-related fire in their service area. *Id.*

First, as discussed above in connection with Issue PS-4, persuasive evidence in the record belies the limited parties' claims that Idaho Power has seriously underestimated the risk of a project-related fire. A preponderance of evidence in the record establishes that 500 kV power lines are unlikely to ignite a fire, that operation of the proposed facility will not significantly increase the risk of wildfire in the project area,²⁷⁸ and that the construction and operation of the facility will not result in significant adverse impact providers' ability to provide fire protection. The evidence also demonstrates that, in the unlikely event of a project-related fire, fire response agencies would be able to promptly respond to and suppress the fire.

Local agency response. Both Mr. Lyons and Ms. Webster raised concerns that local agencies would be delayed in their response until Idaho Power de-energized the line. However, the record establishes that the Company will be able to de-energize the line remotely in a matter of seconds. Therefore, any delay in this regard would be minimal.²⁷⁹ Ms. Webster also argued that local agency response times are incorrect in the Proposed Order Table PS-9²⁸⁰ because they do not include time that may be needed to muster a crew of volunteers. However, the record demonstrates that local fire districts and adjacent fire protection agencies have established mutual aid agreements to pool resources, ensure cooperation between these entities, and prevent

²⁷⁷ In his Closing Brief, Mr. Lyons mistakenly asserts that the Wildfire Mitigation Plan is an update to the draft FPS Plan. He then questions the sufficiency of the Wildfire Mitigation Plan under the Council's standards and the Oregon PUC's rules. Lyons Closing Brief on Issue PS-10. First, the FPS Plan and the Wildfire Mitigation Plan are separate plans that serve different purposes. The latter is not a replacement for, or update of, the former. Second, Mr. Lyons' challenges to the Wildfire Mitigation Plan fall outside the scope of Issue PS-10. Issue PS-10 is limited to the adequacy of the draft FPS Plan and the ability of local service providers to respond to a facility-related fire. Because Mr. Lyons does not have standing to challenge Idaho Power's Wildfire Mitigation Plan, the ALJ declines to address these arguments in any substantive manner.

²⁷⁸ Lautenberger Rebuttal Test. at 25-27, 54-62.

²⁷⁹ Dockter Rebuttal Test. at 13.

²⁸⁰ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 579-581 of 10016.

fires on a county and state level instead of isolating efforts to local districts.²⁸¹ Therefore, in the unlikely event that a local volunteer fire response organization needed several minutes to muster a crew to respond to a project-related fire, other agencies in the area would respond in accordance with the mutual aid agreements.

Ms. Webster also questions whether local fire responders have been adequately trained to fight transmission line fires. However, there is no evidence indicating such specialized training is necessary.²⁸² The evidence establishes that the response to a project-related fire would be similar to a wildland fire, because a fire's cause of ignition does not lead to different fire behavior or require different suppression methods to contain the fire perimeter.²⁸³ Finally, Mr. Lyons asserts that Idaho Power has not adequately assessed access points for first responders to reach the project but, as Idaho Power notes, the Company identified vehicle access points for all routes in the ASC.²⁸⁴

In summary, notwithstanding the limited parties' evidence and argument, a preponderance of evidence in the record establishes that the draft FPS Plan is adequate and that local services providers would be able to respond to and suppress a facility-related fire. In addition, as required by OAR 345-022-0110(1), a preponderance of the evidence demonstrates that the construction and operation of the facility will not result in significant adverse impact providers' ability to provide fire protection.

Proposed site certificate conditions related to Issue PS-10:

Mr. Lyons proposed two site certificate conditions related to fire protection for the first time in his Closing Brief.²⁸⁵

²⁸¹ ODOE - B2HAPPDoc3-38 ASC 21_Exhibit U_PublicServices_ASC 2018-09-28, page 20 of 143.

²⁸² Moreover, as provided in the draft FPS Plan, Idaho Power offers a training course for emergency responders that addresses potential hazards involving electricity and necessary guidelines that help ensure the safety of responders and the general public. ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 9785 of 10016.

²⁸³ Dockter Rebuttal Test. at 19-20.

²⁸⁴ See generally Proposed Order, Attachment B-5, Road Classification Guide and Access Control Plan, ASC Exhibit B, Attachment B-5, ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 8504-8646 of 10016.

²⁸⁵ Mr. Lyons proposed the following:

- (1) Before siting can be approved, Idaho Power should consult with each county along the proposed route about their wildfire protection plans and meet with local forestry, government, and fire authorities in order to revise their fire risk assessment to conform to that specified in OAR 860-300-0002, and to insure that county and industry risk ratings are in agreement; and

Based on the findings herein, the proposed conditions are unnecessary.

The Department's proposed amendments to Recommended Public Services Condition 6, Attachment U-3 of the Proposed Order (addressing finalization of the draft FPS Plan), are addressed above in connection with Issue PS-4.

Ruling on Idaho Power's Motion to Strike portions of Mr. Lyons' Closing Brief on Issue PS-10:

In the motion, Idaho Power moves to strike, or alternatively give no weight to, portions of Mr. Lyons' Closing Brief challenging the adequacy of the Wildfire Mitigation Plan on the grounds that Mr. Lyons' arguments fall outside the scope of Issue PS-10. Motion to Strike at 3. Mr. Lyons opposes Idaho Power's motion as procedurally inappropriate. Lyons Opposition to Motion to Strike at 1.

The ALJ agrees that Mr. Lyons does not have standing to challenge the sufficiency of the Wildfire Mitigation Plan and therefore his arguments in that regard fall outside the scope of Issue PS-10. Accordingly, as noted above, the ALJ grants Idaho Power's alternative request and declines to consider Mr. Lyons' statements and arguments regarding the sufficiency of the Wildfire Mitigation Plan.

Recreation Standard

As pertinent here, OAR 345-022-0100, the Recreation standard states:

(1) [T]o issue a site certificate, the Council must find that the design, construction and operation of a facility, taking into account mitigation, are not likely to result in a significant adverse impact to important recreational opportunities in the analysis area as described in the project order. The Council shall consider the following factors in judging the importance of a recreational opportunity:

- (a) Any special designation or management of the location;
- (b) The degree of demand;
- (c) Outstanding or unusual qualities;
- (d) Availability or rareness;
- (e) Irreplaceability or irretrievability of the opportunity.

Recreation activities at Morgan Lake Park – Issue R-1

Issue R-1: Whether Applicant adequately evaluated the potential adverse impact

(2) If reliable fire ratings then indicate high fire risk in the Morgan Lake area, the proposed transmission line should be buried underground through the area of elevated risk, or re-routed, preferably to the original BLM-approved route.

Lyons Closing Brief at 11-12.

of the proposed facility on recreational opportunities at Morgan Lake Park.

Limited party Colin Andrew has standing on Issue R-1. Mr. Andrew provided direct testimony in support of his claim that Idaho Power did not adequately evaluate the potential adverse impacts the proposed facility will have on recreational opportunities at Morgan Lake Park. Mr. Andrew asserts that Idaho Power did not evaluate the visual impacts of a proposed communication station near Morgan Lake Park, viewers' subjective perceptions, or potential noise impacts to users near the edge of Twin Lake.²⁸⁶ Andrew Direct Test. at 7-11. Mr. Andrew also submitted testimony from other La Grande residents, frequent visitors to Morgan Lake Park, who testified to their belief that construction and operation of the proposed transmission line will destroy the beauty and serenity of Morgan Lake Park and have an adverse impact their ability to use and enjoy recreation opportunities at the Park.²⁸⁷ Mr. Andrew did not file closing argument on this issue.

As set out in the findings, Idaho Power evaluated potential impacts to Morgan Lake Park under the Recreation standard because the park is an important recreational opportunity within the project analysis area. Morgan Lake Park is not a scenic resource described in the Scenic Resources standard or a protected area under the Protected Areas standard, and therefore Idaho Power was not required to evaluate the park under those standards. Contrary to Mr. Andrew's claims, a preponderance of the evidence in the record establishes that, taking into account mitigation, the proposed facility is not likely to result in a significant adverse impact to the recreational opportunities at Morgan Lake Park.²⁸⁸ More specifically, a preponderance of the evidence establishes that, with the proposed design modifications set out in Recommended Recreation Condition 1, the proposed Morgan Lake Alternative route will have a less than significant visual impact to the recreational opportunities at Morgan Lake Park.²⁸⁹

²⁸⁶ Mr. Andrew also contends that the proposed site boundary for the Morgan Lake Alternative route runs through Morgan Lake Park. Andrew Direct Test. at 5-6. This is incorrect. Idaho Power does not propose any project facilities within the Park boundary, and no portion of the site boundary overlaps with the Park boundary. Stippel Rebuttal Test. at 1; Kling Rebuttal Test. at 86. In addition, Mr. Andrew asserts that Morgan Lake Park is a State Game Refuge. Andrew Direct Test. at 3. There is no persuasive evidence in the record establishing that the park is currently designated as a wildlife refuge. However, even if the park was so designated, that fact would not invalidate Idaho Power's analysis of the project's impacts on recreational opportunities at the park. Finally, Mr. Andrew contends that the project would "ruin" stargazing opportunities at the junction of Morgan Lake Road and the park entrance road. Andrew Direct Test. at 2. This argument falls outside the scope of Issue R-1 because the referenced junction is not within the park boundaries and the road itself is not an important recreational opportunity subject to review under the Recreation standard. *See* OAR 345-022-0100(1) (discussing factors to be considered in judging the importance of a recreational opportunity).

²⁸⁷ *See* Carper Direct Test., Edvalson Direct Test., Griffith Direct Test., Jones Direct Test., McAllister Direct Test., and Witek Direct Test.

²⁸⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 530-31 of 10016.

²⁸⁹ *Id.*

As demonstrated by ASC Exhibit T, Idaho Power's November 2019 supplemental analysis of impacts at Morgan Lake Park, and the November 2021 Revised Supplemental Analysis,²⁹⁰ Idaho Power has adequately evaluated the potential adverse impacts of the proposed facility on the recreational opportunities at Morgan Lake Park. Contrary to Mr. Andrew's contention, Idaho Power was not required to collect data on how the "typical visitor" to Morgan Lake Park would perceive the facility as part of its impact assessment. The evidence establishes that recreational opportunities will continue in a natural setting throughout a vast majority of the park, because no project component will be visible from approximately 84 percent of the park area.²⁹¹ Rather, high-intensity visual impacts will only occur in about 16 percent of the park, mostly in the southern portion, where the project will be close to the park and vegetation will provide little or no screening.²⁹² Nevertheless, although visible from certain locations within the park, the project will not preclude recreational opportunities and recreation will continue to occur in a natural setting throughout the vast majority of the park.²⁹³ The project's potential visual impacts to Morgan Lake Park will be less than significant, as that term is defined by Council rule.

In addition, contrary to Mr. Andrew's assertions, a preponderance of the evidence establishes that Idaho Power adequately evaluated the potential noise impacts on recreation resources at Morgan Lake Park. As detailed in the Morgan Lake Park Revised Supplemental Analysis, Idaho Power analyzed potential noise impacts resulting from construction and operation by discussing the predicted noise levels at various camping and recreation locations in the park.²⁹⁴ Idaho Power found that noise impacts during construction would be short-term. During facility operation, noise impacts would come from periodic vegetation maintenance, inspections, and corona noise from the transmission line. Noise from maintenance and inspections would be short term, occurring about once a year. Corona noise from the transmission lines would be low-level, exceed ambient levels only infrequently during foul weather events, and would not preclude recreational opportunities. Accordingly, the proposed facility will result in a less than significant noise impact to recreation at Morgan Lake Park.²⁹⁵ Mr. Andrew has not presented any persuasive evidence demonstrating otherwise.

Visual impacts at Morgan Lake Park – Issues R-2, R-3, and R-4

Issue R-2: Whether the visual impacts of the proposed facility structures in the viewshed of Morgan Lake Park are inconsistent with the objectives of the Morgan

²⁹⁰ Kling Rebuttal Ex. E.

²⁹¹ Kling Rebuttal Test. at 102.

²⁹² *Id.* at 102; Kling Rebuttal Ex. E at 17.

²⁹³ *Id.*

²⁹⁴ Kling Rebuttal Ex. E at 3-5.

²⁹⁵ Kling Rebuttal Ex. E at 6.

Lake Park Recreational Use and Development Plan and should therefore be reevaluated.

Limited parties Lois Barry and Michael McAllister have standing on Issue R-2. The limited parties provided direct testimony asserting that the construction and operation of the proposed transmission line will have an adverse impact on visitors' ability to use and enjoy recreation opportunities at the Morgan Lake Park. In her Closing Argument on Issue R-2, Ms. Barry asserts that the Morgan Lake Plan "should prevail" and that Idaho Power erred rating the proposed facility's visual impacts to Morgan Lake Park as less than significant. L. Barry Closing Argument at 28-30. In his Closing Brief, Mr. McAllister argues that, in evaluating Morgan Lake Park as an important recreational resource, Idaho Power did not give sufficient weight to the management objectives of the Morgan Lake Plan. Mr. McAllister asserts that, had Idaho Power given sufficient weight to the Park Plan's objectives of minimum development to preserve the maximum natural setting, it would have determined that the proposed facility will result in a significant adverse visual impact.²⁹⁶ McAllister Closing Brief at 4-6.

As set out in the findings, the Policy Statement in the Morgan Lake Plan states, in pertinent part:

Morgan Lake Park shall be managed and improved in a manner consistent with the objective of providing a quality outdoor recreational experience harmonious with a natural forest and lake area (as opposed to typical city park activities). Example activities consistent with this objective include fishing, bird watching, nature study, boating, but do not include baseball, motorbike trails, hunting, shooting, or playground activities using swings, merry-go-rounds, slides, etc.

McAllister Ex. 4 at 6. The limited parties contend that Idaho Power did not sufficiently consider the proposed facility's visual impacts on recreational opportunities in undeveloped areas of the park and should have given more weight to the Morgan Lake Plan's policy of preserving the park's natural forest and lake setting.

First, the record establishes that Idaho Power is not required to demonstrate compliance with the Morgan Lake Plan for purposes of the Recreation Resources standard because there are no proposed project components located within the park boundary. Second, the record demonstrates that Idaho Power did consider the objectives and values of the Morgan Lake Plan ~~in its analysis.~~_____

²⁹⁶ Mr. McAllister makes several arguments in his Closing Brief that are outside the scope of Issue R-2. Because these arguments are outside the scope of Issue R-2 and Mr. McAllister's standing in this matter, they are not considered. For example, Mr. McAllister argues that the project site boundary crosses into Morgan Lake Park. McAllister Closing Brief at 6-10. Not only is this claim outside the scope of Issue R-2, but a preponderance of the evidence establishes otherwise. Mr. McAllister also argues that Idaho Power's assessment of the proposed facility's impact on Morgan Lake Park, including the November 2021 Revised Supplemental Analysis is "deeply flawed and based on unsupported assumptions." McAllister Closing Brief at 10-22. Issue R-2 asks whether the proposed facility's visual impacts should be reevaluated because they are *inconsistent with the objectives of the Morgan Lake Park Plan*, and not whether Idaho Power's impact assessment was flawed in other respects. Furthermore, that contention is

addressed above in connection with Issue R-1.

In all three evaluations (ASC Exhibit T, the November 2019 supplemental analysis, and the November 2021 Revised Supplemental Analysis), Idaho Power referenced the Morgan Lake Plan's goals and objectives. In its November 2019 supplemental analysis, Idaho Power noted that although Morgan Lake Park is an important recreation opportunity, the Morgan Lake Plan did not identify any specific scenic views or values as particularly important providing a quality outdoor recreational experience.²⁹⁷ In the Proposed Order, the Department included Recommended Recreation Condition 1 to mitigate the overall potential visual impacts to visitors Morgan Lake Park and users of the park's recreational opportunities.²⁹⁸

In response to the limited parties' ongoing claims that Idaho Power did not sufficiently consider the proposed facility's potential impact to recreational opportunities in the undeveloped areas in the park, the Company revisited its impact analysis of the park. Idaho Power provided additional evidence of the project's potential adverse impacts to Morgan Lake Park in Kling Rebuttal Exhibits E, F and G.²⁹⁹ Idaho Power specifically addressed disbursed recreation opportunities in undeveloped areas of the park such as bird watching and nature study (both of which are referenced in the Morgan Lake Plan Policy Statement). The Revised Supplemental Analysis acknowledged that scenery is a valued attribute of the recreational opportunities at Morgan Lake Park.³⁰⁰ The Revised Supplemental Analysis also recognized that the proposed facility would be visible from approximately 16 percent of the park, primarily from the access road and day-use parking areas located to the south of Morgan Lake, and undeveloped areas west and south of Little Morgan Lake. Idaho Power acknowledged that in those areas of the park, where the towers are not screened, the visual contrast will be high. Idaho Power also acknowledged that at certain observation points within that 16 percent area of visibility, scenic integrity would be reduced to low and viewer perception could be high.³⁰¹ Nevertheless, Idaho Power concluded (and the Department concurred³⁰²) that impacts to the park *overall* would be less than significant, and that the proposed mitigation (including the proposal to expand use of the H-frame structures to all tower locations between mileposts 5 to 8) would further reduce the potential visual impacts in that 16 percent of the park.

To summarize, Issue R-2 asks, in essence, whether the proposed facility's visibility from certain vantage points within the boundary of Morgan Lake Park are inconsistent with the

²⁹⁷ See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7702 of 10016.

²⁹⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 530-31 of 10016.

²⁹⁹ Exhibit E is the Revised Morgan Lake Park Supplemental Analysis (Nov. 12, 2021); Exhibits F1, F2, and F3 are video simulations of potential visual impacts in Morgan Lake Park; and Exhibit E is a study of tree heights and locations at Morgan Lake Park.

³⁰⁰ Kling Rebuttal Ex. B at 17.

³⁰¹ *Id.* at 14-17.

³⁰² See ODOE Response to Closing Arguments at 109.

Morgan Lake Plan and whether Idaho Power should reevaluate those visual impacts. A preponderance of the evidence establishes that, although the proposed facility will not be built within the park boundaries, the park is nevertheless an important recreational opportunity in the project's analysis area. For that reason, Idaho Power looked to the objectives and values of the Morgan Lake Plan to determine that scenery is a valued attribute of Morgan Lake Park. The Company incorporated that determination in its analysis of the proposed facility's potential impacts to the park. Contrary to the limited parties' contentions, the Revised Supplemental Analysis confirms that, taking into account mitigation, the proposed facility's impact on recreational opportunities at Morgan Lake Park will be less than significant. Indeed, as the Department notes, the Recreation standard does not require the Council to find that there will be *no* impact on a recreational opportunity, only that there is sufficient mitigation to ensure that impacts will be avoided, minimized, corrected or compensated so the impact is less than significant.³⁰³

Ruling on Mr. McAllister's Request to Exclude Kling Rebuttal Exhibit E:

In his Closing Brief, Mr. McAllister asks that the ALJ strike Idaho Power's Revised Supplemental Analysis (Kling Rebuttal Ex. E) from the evidentiary record because it is a "new study and opinion" to which the limited parties were "denied the opportunity to respond." McAllister Closing Brief at 20. As explained below, Mr. McAllister's argument is not persuasive and his request to exclude the exhibit is denied.

Idaho Power timely submitted the Revised Supplemental Analysis (Kling Rebuttal Exhibit B) in support of its position on Issues SR-2, SR-3, SR-7, R-1, R-2, R-3, and R-4. The limited parties with standing on those issues had the opportunity to object to this evidence following its filing in November 2021,³⁰⁴ but did not do so. The limited parties also had the opportunity to respond to the substance of the revised analysis in their surrebuttal testimony and the opportunity to question Ms. Kling about the revised analysis during the cross-examination hearing.³⁰⁵ Kling Rebuttal Ex. E was properly admitted into the evidentiary record (*see* Appendix 1, Table of Additional Admitted Evidence) and is properly considered herein. Therefore, the ALJ denies the request to strike or exclude this evidence.

Ruling on Idaho Power's Motion to Strike Portions of Mr. McAllister's Closing Arguments on Issue R-2:

Idaho Power moves to strike, or in the alternative requests that the ALJ give no weight to, statements in Mr. McAllister's closing arguments that address issues outside the scope of Mr. McAllister's standing on Issue R-2 and/or that were already addressed and resolved on summary determination. Specifically, Idaho Power challenges:

³⁰³ *Id.*

³⁰⁴ *See Second Case Management Order* at 10 (setting November 22, 2021 as the deadline for filing objections to rebuttal testimony).

³⁰⁵ Ms. Barry timely filed a request to cross-examine Ms. Kling regarding Issue R-2. Mr. McAllister did not file a similar request.

1. All statements relating to Idaho Power's development of the Morgan Lake Alternative;
2. Mr. McAllister's arguments that Idaho Power was required to survey subjective evaluations of visual impacts to Morgan Lake Park;
3. Mr. McAllister's argument that a portion of the Project site is located within the boundaries of Morgan Lake Park;
4. All statements relating to the route analyzed in the federal National Environmental Policy Act ("NEPA") process, including any assertions that Idaho Power identified the Proposed Route as the same route analyzed in the federal process;
5. Mr. McAllister's arguments that Idaho Power must analyze wetlands located within Morgan Lake Park as Habitat Category 1; and
6. Mr. McAllister's statements regarding compliance with Oregon's Wildlife Diversity Program, the 1986 Emergency Wetlands Resources Act, and/or Oregon's Comprehensive Outdoor Recreation Plan.

Idaho Power's Motion to Strike, Issue R-2 at 9. Mr. McAllister filed an opposition to the motion, asserting that the motion is procedurally improper and substantively incorrect. McAllister Opposition to Motion to Strike, Issue R-2 at 1-4.

Although the *Case Management Order* does not address motions to strike, the Council's procedural rules specifically allow parties, including limited parties, to submit motions seeking an order or other relief. OAR 345-015-0054(1). Therefore, the ALJ rejects Mr. McAllister's procedural challenge to the motion. The ALJ also agrees with Idaho Power that Mr. McAllister's closing brief includes arguments that fall outside the scope of Issue R-2, outside the scope of Mr. McAllister's standing in this matter, and/or outside the Council's jurisdiction.³⁰⁶

As discussed above, Issue R-2 asks whether the proposed facility's visibility from certain vantage points within the boundary of Morgan Lake Park are inconsistent with the Morgan Lake Plan and whether Idaho Power should reevaluate those visual impacts. Mr. McAllister's assertion that Idaho Power did not adequately study the Morgan Lake Alternative falls outside the narrow scope of Issue R-2. Mr. McAllister's challenge to Idaho Power's methodology for assessing visual impacts and his claim that the Company should have surveyed typical visitors to

³⁰⁶ Mr. McAllister appears to acknowledge as much in his Closing Brief, where he states:

It bears mention that the narrow issue R-2 as articulated by this body does not accurately reflect the issue Petitioner McAllister raised in public comment and his Petition for Party Status: the failure to conduct site certificate review in a manner consistent with federal agency review[.] * * * Petitioner McAllister was precluded from challenging this core issue—properly raised during public comment—during the contested case. Petitioner McAllister intends to appeal the exclusion of this issue at the conclusion of the contested case.

McAllister Closing Brief at 3.

Morgan Lake Park is also outside the narrow scope of Issue R-2.³⁰⁷ Additionally, Mr. McAllister's claims regarding the project site boundary in relation to Morgan Lake Park were conclusively resolved on summary determination. Mr. McAllister's arguments regarding federal agency review and the BLM's recommended preferred route are not only outside the scope of Issue R-2 but also outside Council's jurisdiction. Finally, Mr. McAllister's arguments pertaining to the Morgan Lake Alternative and compliance with the Fish and Wildlife Habitat standard are outside the scope of Issue R-2. The arguments were already resolved on summary determination (Issue FW-13). Accordingly, in the context of Issue R-2, the ALJ grants Idaho Power's alternate request and gives the challenged statements no weight.

Issue R-3: Whether the mitigation proposed to minimize the visual impacts of the proposed facility structures at Morgan Lake Park (\$100,000 for recreational facility improvements) is insufficient because the park's remote areas will not benefit from the proposed mitigation.

Limited parties Lois Barry, Peter Barry, Colin Andrew, Kathryn Andrew, and Irene Gilbert have standing on Issue R-3. Lois Barry and Peter Barry filed written testimony and exhibits in support of their positions on the issue, along with closing arguments. The limited parties argue that Idaho Power's agreement with the City of La Grande to pay \$100,000 for park improvements as further mitigation for potential impacts to Morgan Lake Park is insufficient because the offered funds will not address impacts to the undeveloped areas in the park.³⁰⁸ L. Barry Direct Test.; P. Barry Direct Test. Ms. Barry and Mr. Barry also contend this proposed mitigation is inadequate because the project will still be visible from certain areas of the park. *Id.* In her Closing Arguments, Ms. Barry asserts that the agreement is improper because the La Grande City Council did not comply with the Morgan Lake Plan and did not consult with the Morgan Lake Advisory Committee and/or the Director of City Parks and Leisure. L. Barry Closing Arguments at 14.

First, it is important to note that the MOA agreement between Idaho Power and the City of La Grande is a matter outside of the siting process and therefore outside the Council's jurisdiction and scope of review. As the Department explained in the Proposed Order, the MOA is only material to the Council's review under the Land Use standard, because Idaho Power's commitment to provide \$100,000 for improvements to the facilities at Morgan Lake Park (if the Company selects the Morgan Lake Alternative route) provides evidence of the project's compliance with Goal 8 (Recreation Needs).³⁰⁹ The promised payment of \$100,000 to the City is not designed or intended to provide mitigation for the project's visual impacts at Morgan Lake Park under the Recreation standard. Rather, as discussed above, the proposed mitigation for the project's visual impacts at the park is Recommended Recreation Condition 1, requiring the use

³⁰⁷ However, this same argument is addressed above in the context of Issue R-1.

³⁰⁸ Ms. Barry also argues that undergrounding the project segment near Morgan Lake Park is the only acceptable mitigation for visual impacts. L. Barry Direct Test. at 2. Not only is this argument outside the scope of Issue R-3 but also, as discussed elsewhere in this order, undergrounding is outside the Council's jurisdiction in this matter, because Idaho Power did not propose to underground any facility segments.

³⁰⁹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 250 of 10016.

of smaller, H-frame towers along the visible segment.

Because Idaho Power and the City of La Grande executed the MOA outside of the Council's site certificate review process, the limited parties' challenges to the City's actions or the agreement itself are outside the Council's purview. Idaho Power has committed to pay the funds for recreational improvements to the park (if the Company selects the Morgan Lake Alternative route), but how the funds are used, *i.e.*, the improvement projects selected, are the City's prerogative. The City may choose to improve the developed areas, refresh the natural areas, or do both. Neither Idaho Power nor the Council have any say in that matter.

Moreover, because the MOA is not intended as mitigation for visual impacts, it is immaterial whether the park's remote areas will benefit from these funds. As previously discussed, to mitigate for the potential visual impacts Idaho Power has proposed micro-siting so that project components are not visible from the vast majority of the park and, for those components that will be visible from certain remote areas in the park, the Company has proposed design changes to minimize the visible impact. Also as previously discussed, the Recreation standard does not require the Council to find that the project will have no impacts to Morgan Lake Park, only that overall the project has a less than significant impact on the recreational activities at the park. Here, a preponderance of the evidence supports Idaho Power's conclusion (and the Department's concurrence) that, with Recommended Recreation Condition 1, the impacts from the proposed facility at Morgan Lake Park will be less than significant.

Ruling on Mr. Barry's Motion to Strike the ASC:

In the context of his standing on Issue R-3, on March 30, 2022, Mr. Barry filed a letter requesting that the ALJ strike the entire ASC. In the letter, Mr. Barry argues that the ASC is flawed, does not comply with the Council's standards, and therefore should be discarded. Mr. Barry also asserts that the citizens of Oregon oppose the project and the ALJ should give this opposition significant weight in evaluating the ASC.

For the following reasons, Mr. Barry's request is denied. First, Mr. Barry's general request to strike, discard, or deny the ASC exceeds the scope of Issue R-3, and Mr. Barry's standing as a limited party in this matter. As set out in the *Amended Order on Party Status*, Mr. Barry's participation in the contested case is limited to the discrete issue of proposed mitigation for visual impacts at Morgan Lake Park. Second, even if Mr. Barry had standing to challenge the ASC in its entirety, he does not identify or reference any specific evidence in support of his contentions. Finally, as set out in the *Case Management Order*, the ALJ's authority and obligations in this contested case are governed by the Model Rules of Procedure for Contested Cases (OAR 137-003-0000 through 137-003-0092) and the Council's procedural rules governing site certificate contested case hearings (OAR 345-015-0001 through OAR 345-015-0240). The ALJ must apply the burden of proof and standards of evidence in accordance with these rules. In other words, and contrary to Mr. Barry's request, it is not appropriate or acceptable for the ALJ to "weigh the efforts and arguments heavily on the side of the citizens"³¹⁰ simply because the applicant is an energy corporation.

³¹⁰ P. Barry March 30, 2022 Letter to Judge Webster at 1.

Issue R-4: Whether Applicant's visual impact assessment for Morgan Lake Park adequately evaluates visual impacts to the more than 160 acres of undeveloped park land and natural surroundings, as visual simulations were only provided for high-use areas.

Lois Barry has standing on Issue R-4. Ms. Barry provided written testimony and exhibits in support of her contentions along with written argument. In response to Ms. Barry's claim that Idaho Power did not provide a sufficient visual impact analysis of the remote, undeveloped areas in the park, Idaho Power conducted an additional analysis of potential visual impacts in both the developed and undeveloped areas of the park where visitors engage in dispersed recreation activities. Idaho Power submitted its Revised Supplemental Analysis of Morgan Lake Park as Kling Rebuttal Exhibit E.

In her closing argument, Ms. Barry argues that the visual impact assessment of the natural and undeveloped areas of Morgan Lake Park is incomplete and inadequate. She contends that the valued natural scenery near Little Morgan Lake "would be the most intensely impacted" and that, even if the project would be visible from only 16 percent of the park in the undeveloped natural areas, these natural areas are nevertheless worth protecting. L. Barry Closing Arguments at 2-3. Ms. Barry also argues that Idaho Power's methodology for assessing visual impacts is flawed because the Company: (a) developed its own methodology (instead of using the USFS SMS); (b) did not consider constituent information; and (c) did not specifically assess visitors' enjoyment of the park. *Id.* at 3-11. As explained below, Ms. Barry's challenges to Idaho Power's evaluation of impacts to Morgan Lake Park are not persuasive. Furthermore, Ms. Barry's challenges to Idaho Power's methodology for assessing visual impacts fall outside the scope of Issue R-4.

As explained in the Revised Supplemental Analysis, Idaho Power used a video simulation model to assess potential impacts of the project from undeveloped areas where visitors may engage in dispersed recreation opportunities. The Company's evaluation showed potentially high intensity impacts in areas where there is no vegetation screening, and that there would be low or no visibility of the project from areas where trees will screen views of the towers.³¹¹ Idaho Power acknowledged in its analysis that there could be high magnitude impacts in areas south of Morgan Lake and Little Morgan Lake due to the project's proximity and the lack of screening.³¹² The Company determined that "viewer perception will range from low to high throughout Morgan Lake Park" and that because of this range, "viewer perception for the park as a whole will be medium."³¹³

Although Ms. Barry does not agree with Idaho Power's analysis of and conclusions regarding the project's potential impacts to recreation opportunities at Morgan Lake Park, she

³¹¹ Kling Rebuttal Ex. E at 11.

³¹² *Id.* at 12.

³¹³ *Id.* at 15.

has not demonstrated that the analysis is inadequate, incomplete, or that it fails to demonstrate the proposed facility's compliance with the Recreation standard.³¹⁴ Ms. Barry argues, in essence, that because the project will have a high-intensity viewer perception in some areas of the park, the project will have a significant adverse impact on the enjoyment of those who engage in recreation activities at the park. However, as previously stated, the Recreation standard does not require finding that the project will have no or only minimal impacts on recreational opportunities at Morgan Lake Park. Rather, the standard requires the applicant to demonstrate that, with mitigation, the impacts on recreational opportunities will be less than significant. As discussed above in connection with Issues R-1 and R-2, Idaho Power has provided a preponderance of evidence to establish that, with the proposed mitigation (design features) the project will have a less than significant adverse impact to recreational opportunities at Morgan Lake Park.

Ms. Barry also argues that Idaho Power should have applied the USFS SMS to assess the magnitude of impact and/or should have surveyed visitors to Morgan Lake Park to determine viewer perception. As noted above, Ms. Barry's challenges to the methodology for assessing visual impacts fall outside the scope of Issue R-4. Issue R-4 asks whether Idaho Power adequately evaluated visual impacts "to the more than 160 acres of undeveloped park land and natural surroundings." In other words, this issue concerns the scope of the Morgan Lake Park evaluation and the Company's conclusions regarding magnitude of impact, but it does not encompass challenges to Idaho Power's methodology for assessing impacts to visual resources. Moreover, the ALJ previously considered and rejected these same contentions in the *Ruling and Order on Summary Determination of Issue SR-6*.³¹⁵ While not addressed in connection with Issue SR-6, Ms. Barry's assertions that Idaho Power's methodology was inappropriate and not properly vetted or peer-reviewed also exceed the scope of Issue R-4.³¹⁶

In summary, Idaho Power's supplemental analysis of Morgan Lake Park adequately evaluates the proposed project's visual impacts in the undeveloped areas of the park. A preponderance of evidence establishes that although the project will result in long-term visual impacts of varying intensity in Morgan Lake Park, these visual impacts will not preclude visitors from engaging in recreational opportunities in the park. Hence, the project's impacts to the park will be less than significant.

³¹⁴ Like Mr. McAllister, Ms. Barry argued that Idaho Power provided the Revised Analysis "late in the game," thereby denying the limited parties the opportunity to assess its validity. L. Barry Response to Closing Arguments at 3. However, as previously discussed, Idaho Power properly offered the Revised Analysis, video simulations, and tree study as evidence in response to limited parties' claims that the Company did not adequately evaluate the park's undeveloped areas. The evidence was admitted without objection; it is relevant and material to the Council's review under the Recreation standard and is entitled to evidentiary weight.

³¹⁵ In the *Ruling and Order on Summary Determination of Issue SR-6*, the ALJ found that the Council's rules do not require an applicant to employ a specific methodology to assess visual impacts and do not require that the applicant collect constituent information. *Ruling on Issue SR-6* at 12-13.

³¹⁶ Furthermore, even if Ms. Barry had standing to raise these other challenges to Idaho Power's visual impact assessment methodology, she has not demonstrated that the methodology is flawed, incomplete or insufficient to establish the project's compliance with the Council's siting standards.

Proposed site certificate condition related to Issue R-4:

In her Closing Arguments, Ms. Barry asserts the proposed mitigation for visual impacts (lower H-frame towers with a natina finish) is inadequate. She proposes, as a site certificate condition, that Idaho Power “bury the parts of the transmission line that would in any way obstruct the irreplaceable top-of-the-world views from the Park” or that the Company select the BLM Preferred Route instead of the Morgan Lake Alternative route. L. Barry Closing Argument at 20.

Ms. Barry’s proposed condition is inappropriate. It is inappropriate because the Council cannot consider other routes or the undergrounding of segments that Idaho Power did not propose in the ASC. Accordingly, the proposed condition is denied.

Ruling on Idaho Power’s Motion to Strike Portions of Ms. Barry’s Closing Arguments on Issue R-4:

Idaho Power moves to strike, or in the alternative requests that the ALJ give no weight to, statements in Ms. Barry’s closing arguments on Issue R-4 that address issues outside the scope of Ms. Barry’s standing in this contested case and/or issues that were already addressed and resolved on summary determination.³¹⁷ Specifically, Idaho Power challenges Ms. Barry’s assertions that the Company should have applied the USFS SMS to assess visual impacts and should have surveyed visitors to the park to determine viewer perception. Motion to Strike, Issues R-2, R-3 and R-4 at 6-7. Ms. Barry filed an opposition to the motion.

As noted above, in the *Ruling and Order on Summary Determination of Issue SR-6*, the ALJ determined that the fact that Idaho Power did not collect constituent information in accordance with the USFS SMS did not invalidate the Company’s chosen methodology for assessing visual impacts. *Ruling on Issue SR-6* at 12-13. Insofar as Ms. Barry argues, in connection with Issue R-4, that Idaho Power should have applied the USFS SMS and should have surveyed visitors to Morgan Lake Park to determine viewer perception, the ALJ agrees that these legal arguments were already considered and rejected in connection with Issue SR-6. Consequently, in the context of Issue R-4, the ALJ gives Ms. Barry’s arguments regarding the USFS SMS methodology no weight.

Retirement and Financial Assurance Standard

OAR 345-022-0050, the Retirement and Financial Assurance standard provides:

To issue a site certificate, the Council must find that:

- (1) The site, taking into account mitigation, can be restored adequately to a useful, non-hazardous condition following permanent cessation of construction or

³¹⁷ See Idaho Power’s Motion to Strike, Issue R-4, Attachment B.

operation of the facility.

(2) The applicant has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition.

Bond amount – Issue RFA-1

Issue RFA-1: Whether the \$1 bond amount adequately protects the public from facility abandonment and provides a basis for the estimated useful life of the facility.

Limited parties Carbiener, in his personal capacity and on behalf of the OCTA, and Gilbert have standing on this issue. They both challenge the recommended phased-in bonding approach described in the Proposed Order and the Department's recommendation to reduce the bond/letter of credit to \$1 during the first 50 years of operation (Recommended RFA Conditions 4 and 5). The limited parties assert that the \$1 bond amount does not protect the public from the likelihood of facility abandonment. They also challenge the Department's finding that it is highly unlikely the proposed facility will be decommissioned any time in the first 50 years of operation. Both Mr. Carbiener and Ms. Gilbert propose that Idaho Power be required to secure a bond for the full retirement/restoration cost of \$140 million for the life of the facility. (Carbiener Direct Test. at 3; Gilbert Opening Argument on Issue RFA-1 at 10-15; Gilbert Closing Brief on Issue RFA-1.)

In the Proposed Order, based on information presented in the ASC, the Department found that a 100-year lifetime is a reasonable estimated useful life for the proposed facility. The Department also found that, while some level of risk exists, the likelihood that Idaho Power would abandon the proposed facility during the first 50 years of operation is very low. The Department agreed that the risk of facility abandonment or retirement will increase after the first 50 years, as future unforeseen technological and electricity market changes could affect Idaho Power's financial condition or the facility's continued viability.³¹⁸ The Department also agreed that Idaho Power's proposed financial assurance methodology, *i.e.*, incrementally increasing the bond/letter of credit on an annual basis after the facility has been in service for 50 years, is a reasonable approach to accounting for the possibility that the facility may eventually be retired. Furthermore, as provided in Recommended RFA Condition 5, and to account for conditions that could impact the facility's viability in the first 50 years of operation, the Department adopted Idaho Power's proposal to report on the facility's continued viability and the Company's financial condition on the fifth anniversary of the in-service date and every five years thereafter.³¹⁹

The limited parties have presented no evidence to support their claims that the \$1 bond for the first 50 years of facility operation is insufficient, that the facility is likely to become

³¹⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 309 of 10016.

³¹⁹ *Id.*, pages 307-311 of 10016.

obsolete or unnecessary in that time frame, and/or that Idaho Power will become insolvent during that time. They have not countered Idaho Power's evidence that a 500 kV transmission line is an extremely valuable asset and the Company is developing and constructing the facility with the expectation that it will operate in perpetuity.³²⁰ The limited parties also have not shown that Wells Fargo's letter of willingness (updated as of October 2021 for a period not to exceed five years) to arrange a syndicated letter of credit in an amount up to \$141 million during the construction phase fails to satisfy the Council's RFA requirements.³²¹ Furthermore, to the extent the limited parties compare the financing and operation of the proposed transmission line to recent solar projects (*i.e.*, Bakeoven Solar and Obsidian Solar Center), these comparisons are misplaced. As Idaho Power's expert Randy Mills testified, the financial and operational risks associated with these solar facilities are entirely distinct from those associated with a major transmission line proposed by a regulated utility.³²²

Additionally, Ms. Gilbert's legal challenge to the proposed phased-in bonding approach misconstrues the Council's rules. Ms. Gilbert argues that, under OAR 345-022-0000(3)(c), the Council lacks the ability to apply a balancing determination to the RFA standard, there is no room for flexibility, and therefore the Council must require Idaho Power to maintain a bond for the full amount of restoration costs throughout construction and the operational life of the facility. Gilbert Opening Argument on Issue RFA-1 at 3; Gilbert Closing Brief on Issue RFA-1 at 7.

Contrary to Ms. Gilbert's contention, the Council's rules require the certificate holder to have a bond/letter of credit "in a form and amount satisfactory to the Council" to restore the site. OAR 345-022-0050(2); OAR 345-025-0006(8). Accordingly, the rules give the Council the discretion to approve a bond/letter of credit in an amount less than the full cost of site restoration as long as that amount is *satisfactory to the Council*. The plain text of the rules allows the Council to exercise reasonable judgment in determining the appropriate form and amount of the bond/letter of credit. Indeed, OAR 345-025-0006(8) (Mandatory Condition 8), specifically authorizes the Council to "specify different amounts for the bond or letter of credit during construction and during operation of the facility." Had the Council intended to require that a certificate holder maintain a bond/letter of credit for the full decommissioning cost at all times, then it could and would have so stated in its rules.

Furthermore, while the General Standard of Review prohibits the Council from applying "the balancing determination"³²³ to the RFA standard (*see* OAR 345-022-0000(3)(c)), the

³²⁰ *See* Ellsworth Rebuttal Test. at 4-7.

³²¹ Mills Rebuttal Test., Ex. B.

³²² *See* Mills Rebuttal Test. at 7-13 (explaining why the Bakeoven and Obsidian solar projects differ from the B2H project and are not comparable to B2H in organizational expertise, financing, and likelihood of retirement).

³²³ Under OAR 345-022-0000(2), the Council may issue a site certificate for a facility that does not meet one or more applicable Council standards "if the Council determines that the overall public benefits of the facility outweigh any adverse effects on a resource or interest protected by the applicable standards the facility does not meet. * * *."

discretion granted to the Council under the RFA standard to determine the appropriate form and amount of the bond/letter of credit is not the same as the balancing determination. Also, a balancing determination is not necessary here because, as explained in the Proposed Order, Idaho Power has met the RFA standard by demonstrating a reasonable likelihood of obtaining a bond/letter of credit in an amount sufficient to restore the site to a useful, non-hazardous condition.³²⁴

In short, limited parties Carbiener and Gilbert stated concerns, but they provided no evidence or persuasive legal argument to contradict the findings in the Proposed Order and the testimony of Idaho Power's expert witnesses explaining why it is highly unlikely that the facility would be retired before the end of its useful life. The limited parties also provided no evidence that Idaho Power would be unable to bear the costs of decommissioning the facility and restoring the site to a useful, non-hazardous condition. Idaho Power, on the other hand, persuasively explains why it is not necessary, and in fact inappropriate, to require that it maintain a bond/letter of credit at the full decommissioning cost (approximately \$141 million) for the life of the project.³²⁵

A preponderance of the evidence establishes that the proposed \$1 bond amount for the first 50 years of operation, with a phased-in increase over the next 50 years of operation until the bond covers the full decommissioning cost, adequately protects the public from facility abandonment and provides a basis for the estimated useful life of the facility.

Proposed site certificate conditions related to Issue RFA-1:

Mr. Carbiener timely proposed two conditions, which are addressed below. Ms. Gilbert also timely proposed conditions related to Issue RFA-1 also addressed below.^{326, 327}

³²⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 305-06 of 10016.

³²⁵ As set out in ASC Exhibit M, Idaho Power estimates that the cost to maintain a bond/letter of credit to guarantee the full decommissioning cost would be approximately \$880,000 annually, based on 2018 interest rates and market conditions. Because Idaho Power is a regulated utility, the cost incurred by Idaho Power to maintain such a bond/letter of credit would be built into the rates of the Company's utility customers and would be in addition to the decommissioning costs that are normally built into utility rates. See ODOE - B2HAPPDoc3-21 ASC 13_Exhibit M_Financial Capability_ASC 2018-09-28, page 8 of 19.

³²⁶ Another condition proposed by Ms. Gilbert related Idaho Power's financial ability to pay for construction costs, but not directly related to Issue RFA-1, is addressed *infra* under the heading, *Gilbert Additional Proposed Site Certificate Conditions*.

³²⁷ See Gilbert Closing Brief on Issue RFA-1 at 9-11.

Carbiener Proposed RFA-1 Condition 1: During the four years of construction Idaho Power will secure a bond for the full estimated amount of \$140 million.

Carbiener Proposed RFA-1 Condition 2: When [the facility is] operational, Idaho Power will provide full amount of bond, \$140 million.

Carbiener Direct Test. 3.

Both the Department and Idaho Power oppose Mr. Carbiener's proposed conditions as unnecessary. Although the Council could impose these conditions, the Council's rules do not require that it do so.

As discussed above, the RFA standard requires that Idaho Power produce evidence that it can obtain a bond or letter of credit in an "amount satisfactory to the Council." OAR 345-022-0050(2). The standard does not require that the certificate holder obtain a bond or letter of credit for the full amount of decommissioning/site restoration. As discussed above, Idaho Power proposed, and the Department approved, the phased-in approach to the bond/letter of credit. As a practical matter, there is no need for Idaho Power to secure a bond for the full decommissioning cost at the outset of construction. Furthermore, given the very low risk that the facility would be retired after construction and before 50 years of service, there is no need for a bond/letter of credit for the full amount of decommissioning/site restoration during that period. Consequently, Mr. Carbiener's proposed RFA conditions are denied.

Gilbert Proposed RFA-1 Condition: Prior to acceptance of a bond in an amount less than the amount identified in OAR 345-02[5]-0006(9), Idaho Power will document that they have established dedicated additional funds which combined with the bond amount will equal the amount identified as being required to restore the site to a useful, non-hazardous condition based upon the calculations in the site certificate and annual adjustments. These funds will be placed in trust and dedicated specifically for use in the restoration of the transmission line site and will not be made available for other uses including those resulting from bankruptcy or actions of Ida-Corp.

Gilbert Proposed Retirement and Financial Assurance Condition 3: In order to replace the mitigation previously provided through a bond the following site certificate condition is necessary to comply with OAR 345-022-0030: 'Idaho Power will provide mitigation for the risk of farm landowners being required to assume the cost of removing the transmission line structures and wires from their property by paying the landowners the estimated cost of them purchasing insurance to protect them from this risk for the 100 years the development is planned to exist.'

Gilbert Proposed Retirement and Financial Assurance Condition 4: Idaho Power must provide documentation that they have the financial resources available to construct and run their share of the Boardman to Hemingway Transmission line without making customers vulnerable to financial collapse.

Gilbert Opening Arguments Regarding Issue RFA-1 at 16.

Council oppose these condition as unnecessary. First, there is no obligation under the Council's rules for the certificate holder to document that it has established dedicated additional funds to cover the full cost of site restoration in addition to a bond/letter of credit in a satisfactory amount. Second, as Idaho Power notes, the Council rules

³²⁸ Pursuant to OAR 345-015-0085(1), "parties shall submit proposed site certificate conditions to the hearing officer in writing according to a schedule set by the hearing officer." In this matter, the deadline for submitting written direct testimony, evidence, and any proposed site certificate conditions was September 17, 2021. *Case Management Order* at 16, 18.

do not contemplate placing decommissioning funds in escrow and there is no precedent for such a requirement. Third, Ms. Gilbert offered no evidence to support her proposals. Because there has been no showing that these proposed RFA conditions are necessary or appropriate, the proposed conditions are denied.

Removal of concrete footings – Issue RFA-2

Issue RFA-2: Whether, in the event of retirement of the proposed transmission line, removal of concrete footings to a depth of one foot below the surface is sufficient to restore the site to a useful, non-hazardous condition.

Mr. Carbiener, on his own behalf and on behalf of OCTA, has standing on Issue RFA-2. He asserts that, in the event the facility is retired, Idaho Power should be required to remove the foundations for each support structure (concrete tower footings) to a depth of three feet below ground, because one foot is insufficient to restore the soil to a useful, non-hazardous condition. Mr. Carbiener contends that three feet below ground is necessary because remaining fragments of concrete can damage soil. (Carbiener Direct. Test on Issue RFA-2 at 4.)

Mr. Carbiener presents no evidence in support of his contention that removal of concrete foundations to a depth of three feet on non-EFU land is necessary to protect soils and return the land to a useful non-hazardous state. Idaho Power, on the other hand, presented testimony establishing that, except within EFU zones, removal of concrete footings to a depth of one foot below grade is appropriate. Jared Ellsworth, a licensed professional engineer, explained that it is more environmentally impactful to remove the concrete footings than it is to leave in place the portion of the footing below a one-foot depth. Increasing the removal depth from one foot to three feet would result in significantly more disturbance to the surrounding ground.³²⁹ Mr. Ellsworth also explained the exception for EFU zoned land, because removing the footings to three feet below ground allows sufficient clearance for farming equipment and installation of irrigation.³³⁰

In the Proposed Order, the Department included Recommended RFA Condition 2, requiring that, if Idaho Power permanently ceases construction or operation of the facility, then it must retire the facility in accordance with a Council-approved retirement plan. The Department also concurred with Idaho Power's retirement plan proposal of removing the footings to a depth of three feet below grade in EFU zoned lands, and to one foot below grade, depending on ground slope, on all other lands. Mr. Carbiener has not shown that Idaho Power must remove all concrete footings to a depth of three feet below ground surface to restore the site to a useful, non-hazardous condition.

Proposed site certificate conditions related to Issue RFA-2:

Carbiener Proposed RFA-2 Condition 1: The completed application and

³²⁹ Ellsworth Rebuttal Test. at 38-39.

³³⁰ *Id.* at 39.

project order will remove tower concrete footings to a depth of three feet below surface of ground. This will be included in EFSC Retirement Plan for action 100 years from today or sooner.

Both the Department and Idaho Power oppose this proposed condition. The Department asserts this condition is unnecessary, because in the unlikely event of facility retirement Recommended RFA Condition 4 will ensure that Idaho Power restores the site to a useful, non-hazardous condition. Idaho Power asserts that the proposal is both unnecessary and inappropriate, because (as discussed above) requiring that concrete footings be removed to a depth of three feet below ground surface on all lands will result in excessive disturbance of existing ground surrounding the footings.

Mr. Carbiener has not provided any evidence indicating that Idaho Power would fail to restore the project site to a useful, non-hazardous condition unless it removed all footings to a depth of three feet below ground surface. Idaho Power has explained why such a requirement is problematic and unnecessary. Accordingly, this proposed condition is denied.

Carbiener Proposed RFA-2 Condition 2: Idaho Power will clean the surrounding soil from any remaining concrete contamination.³³¹

Both the Department and Idaho Power oppose this proposed condition. The Department notes that this proposal is outside the scope of Issue RFA-2, which is limited to the appropriate depth for foundation removal. Idaho Power asserts that, in the event of facility retirement, it will perform concrete footing removal in accordance with industry standards and a Council-approved final retirement plan as required by OAR 345-025-0006(9).

Mr. Carbiener has not provided evidence showing that this proposed condition is necessary or appropriate under the Council's RFA standard. Idaho Power has explained why the proposed condition is unnecessary. Accordingly, this proposed condition is also denied.

Ruling on Idaho Power's Motion to Strike Portions of Mr. Carbiener's Response Brief on Issue RFA-2: In its motion, Idaho Power moves to strike statements in Mr. Carbiener's Response Brief for Issue RFA-2 relating to the process of removing reinforced concrete pillars. Motion at 15-16. The ALJ agrees that the challenged statements are not supported by evidence in the record. Accordingly, in lieu of striking this portion of Mr. Carbiener's argument, the ALJ gives the unsupported statements no evidentiary weight.

Scenic Resources and Protected Areas Standards

OAR 345-022-0080, the Scenic Resources standard, states in pertinent part:

³³¹ In his March 30, 2022 Response Brief on Issue RFA-2, at page 2, Mr. Carbiener changed the wording of this proposed condition to "Idaho Power will remove the surrounding soil from any remaining concrete contamination." This new version is substantively the same as the prior version, and does not change the determination.

[T]o issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in significant adverse impact to scenic resources and values identified as significant or important in local land use plans, tribal land management plans and federal land management plans for any lands located within the analysis area described in the project order.

Also, as pertinent here, OAR 345-022-0040, the Protected Area standard, states: “To issue a site certificate * * * the Council must find that, taking into account mitigation, the design, construction and operation of the facility are not likely to result in significant adverse impact to the [listed protected areas].”³³²

Feasibility of undergrounding – Issue SR-2

Issue SR-2: Whether Applicant satisfied the Scenic Resources and Protected Area standards at Flagstaff Hill/NHOTIC and whether Applicant adequately analyzed the feasibility of undergrounding the transmission line as mitigation for potential visual impacts.

Limited parties Miller and Carbiener, in his personal capacity and on behalf of the OCTA, have standing on Issue SR-2. Mr. Carbiener provided evidence and argument in support of his position on this issue. Mr. Carbiener challenges Idaho Power’s visual impact assessment at the Flagstaff Hill/NHOTIC ACEC and the sufficiency of the Company’s visual depictions (photo simulations) of the proposed facility components in that area. Specifically, he argues that the visual depictions prepared by his witness, Ms. Lingenfelter, demonstrate that the proposed facility will have a significant adverse impact to the scenic resource. In addition, Mr. Carbiener argues that the Company did not adequately assess the feasibility of undergrounding the transmission line as mitigation for its visual impacts to the Flagstaff Hill/NHOTIC area. Carbiener Direct Test. Issue SR-2 at 3-12; Carbiener Closing Brief Issue SR-2 at 2-7.

Both Idaho Power and the Department contend that Idaho Power has provided sufficient evidence for the Council to find that the proposed facility, taking into account the proposed mitigation, will comply with the Scenic Resources and Protected Area standards. Ms. Lingenfelter’s video does not establish otherwise, *i.e.*, that the facility will have a significant adverse impact at the Flagstaff Hill/NHOTIC ACEC. Additionally, both the Department and Idaho Power noted that Idaho Power was not required to propose, nor the Council required to consider additional mitigation, including undergrounding the transmission line. Department Closing Brief at 181-188; ODOE Response Brief at 122-23; Idaho Power Closing Brief at 29-44; Idaho Power Response Brief at 29-36.

Extent of adverse impact. Mr. Carbiener asserts that Idaho Power’s video simulation of the proposed facility at the Flagstaff Hill/NHOTIC ACEC are inaccurate, not based on actual

³³² The Protected Areas standard is addressed in this section with the Scenic Resources standard because the Oregon Trail ACEC-NHOTIC parcel is a protected area located 123.4 feet NE of the project’s proposed route. ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 281 of 10016.

photographs of the area, and “all make believe.” Carbiener Closing Brief Issue SR-2 at 2. Mr. Carbiener also asserts that Idaho Power’s photo simulations showing the proposed project in relation to the existing 230 kV towers actually show that the proposed project would dominate the landscape. *Id.* at 3. He contends that Ms. Lingenfelter’s model also demonstrates that the proposed project would significantly impact the view from NHOTIC and the Oregon Trail. *Id.* at 4.

Contrary to Mr. Carbiener’s contention, Ms. Lingenfelter’s video simulations do not invalidate or outweigh the other evidence in the record demonstrating that, with the proposed mitigation, the proposed project will have a less than significant adverse impact on the scenic value of the NHOTIC and surrounding area. As the Department notes in its Response Brief, both Ms. Lingenfelter’s and Idaho Power’s video simulations have strengths and weaknesses. Both video models help to better understand the proposed project’s potential visual impact at the NHOTIC, but neither realistically depicts the existing landscape and other context necessary to assess the visual impact of the proposed facility in the Flagstaff Hill/NHOTIC area.³³³

The Scenic Resource standard requires Idaho Power to demonstrate that, taking into account mitigation, no significant impacts are likely to result at the NHOTIC. As explained in the findings, Idaho Power developed its own methodology specifically to apply the Council’s definition of “significant.” To be considered significant, a potential impact must: (1) be high intensity; (2) preclude the impacted resource’s ability to provide the scenic value for which the resource was designated or recognized in the applicable land management plan; and (3) last for a duration of at least 10 years.³³⁴

As for the Flagstaff Hill/NHOTIC area, Idaho Power has demonstrated (and the Department concurred) that the visual impacts of the proposed project would be less than significant. Taking into account mitigation via tower design (H-frame towers with a weathered steel finish) the impact would be of medium intensity and would not preclude the resource’s ability to provide the scenic value for which the resource was designated or recognized.³³⁵ In applying its methodology, Idaho Power assumed that viewer sensitivity would be high. However, taking into consideration other characteristics and the landscape context (other developments and the already existing transmission line), the project will be co-dominant with the existing viewshed.³³⁶ Consequently, with mitigation, both viewer perception and the

³³³ Also, as Idaho Power notes in its Response Brief, Ms. Lingenfelter’s model (which includes 129-foot tall towers spaced 900 feet apart) is not an accurate depiction of the proposed project. Near NHOTIC Idaho Power will use towers that range in height from 105 feet to 129 feet, will vary the spans between towers and will microsite tower locations to further reduce the magnitude of visual impacts. Idaho Power Response Brief at 33-34; *see also* Kling Rebuttal Test. at 107-08.

³³⁴ Kling Rebuttal Test. at 49.

³³⁵ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 283-87 of 10016.

³³⁶ As Ms. Kling explained, codominance is not simply a question of the size of the transmission towers relative to other features in the landscape. The project is codominant with other features because, as the viewer looks out on the landscape, the viewer is seeing all of the features as a collective. The viewer’s

resource change would be medium.³³⁷

Undergrounding. Mr. Carbiener also argues that Idaho Power did not sufficiently consider undergrounding the transmission line in the area of NHOTIC and that doing so would make the visual impact less than significant. Carbiener Closing Brief Issue SR-2 at 5-7. As both the Department and Idaho Power correctly note, Idaho Power did not propose undergrounding the transmission line as mitigation for visual impacts at Flagstaff Hill/NHOTIC. The Council is tasked with determining whether the facility, as proposed by Idaho Power, complies with applicable standards, laws and rules. Idaho Power proposed design modifications to mitigate the visual impact of the facility in that area. Because Idaho Power did not propose undergrounding the transmission line, the question of whether undergrounding is a better mitigation option is outside the Council's jurisdiction and, accordingly, outside the scope of this contested case.³³⁸

eye is not selecting one feature, *i.e.*, the proposed facility, to the exclusion of the others in the landscape. Kling Cross-Exam. Test., Tr. Day 6 at 160-163.

³³⁷ Kling Rebuttal Test. at 66-69.

³³⁸ In the Proposed Order, in addressing the visual impact assessment of the Oregon Trail ACEC-NHOTIC parcel, the Department noted that, in response to comments and concerns about the visual impacts at NHOTIC, Idaho Power provided an engineering report and cost estimate for undergrounding the transmission line in this area. The study concluded that the costs would be very high (approximately \$100 million more than the traditional overhead configuration) and that the ground disturbance for installation would be substantially greater than for an above ground line. ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 285-86 of 10016. The Department also noted that information about undergrounding is not required in the ASC and, "more importantly," Idaho Power did not propose undergrounding any portion of the facility as an alternative or as potential mitigation to reduce visual impacts. *Id.* at page 286 of 10016. The Department acknowledged that the Council is not authorized to evaluate alternatives not proposed by the applicant, but then addressed whether the Council could impose undergrounding as a mitigation measure, even if not proposed by the applicant. The Department concluded as follows:

Undergrounding could be considered as "minimizing" impacts of the action if it was found that undergrounding did, in fact, minimize the visual impact of the proposed facility to the extent that the mitigation reduced a potentially significant adverse impact to a level that was less than significant, in compliance with an applicable Council standard.

However, to the extent that undergrounding is viewed as mitigation for potentially significant adverse visual impacts at NHOTIC, the Department emphasizes that the technology and infrastructure needed to underground a transmission line would themselves create visual impacts as well as potential impacts to other resources protected under the Council's standards and not evaluated in the ASC. As described here, therefore, the Department does not find that undergrounding, if a viable mitigation option, is necessary for the proposed facility to comply with the Council's Protected Areas standard. For the reasons described here, the Department does not conclude that the visual impacts of the proposed facility (including recommended Scenic Resources Condition 3) to NHOTIC are significant, and does not find that additional mitigation in the form of undergrounding are necessary to comply with the Council's Protected Area standard.

Proposed site certificate conditions related to Issue SR-2:

In his direct testimony, Mr. Carbiener timely proposed two site certificates related to Issue SR-2.³³⁹

Carbiener Proposed Scenic Resources Condition 1: During construction certificate holder will not construct any new roads or improve any existing roads between Flagstaff Gulch and Highway 86. Access to tower sites will be performed by wide-balloon tired vehicles. Materials (re-bar and concrete) will be delivered by helicopter, tower and conductor placement will be by helicopter. In front of ACEC, no cuts into hillsides, and tower footings made to hill contour. All above ground tower footings to have concrete colored to match sage, or light grey.

Both the Department and Idaho Power object to this proposed condition as unnecessary. The ALJ agrees. First, Mr. Carbiener did not present any evidence or argument in support of these proposed construction-related provisions. Second, the proposed condition is not necessary because any new and/or improved roads will not result in significant visual impacts and Idaho Power's design already includes light grey concrete footings. Accordingly, this proposed condition is denied.

Carbiener Proposed Scenic Resources Condition 2: Idaho Power will provide compensation in the amount of \$3.5 million due to permanent visual impact to the National Historic Oregon Trail and Flagstaff Hill Interpretive Center to comply with the required mitigation as described by the Energy Facilities Siting Council in their site certificate at Attachment S-9; HPMP, p, 22.

Both the Department and Idaho Power also object to this proposed condition as unnecessary. Again, the ALJ agreed with this assessment. This proposed condition is not necessary because a preponderance of the evidence in the record establishes that the design, construction, and operation of the proposed facility, with the mitigation proposed to reduce visual impacts, will have a less than significant adverse impact to the scenic resource and protected area, and therefore satisfies the Scenic Resources and Protected Area standards. Consequently, this proposed condition is also denied.

NHOTIC/Oregon Trail visual impact assessment – Issues SR-3 and SR-7

Issue SR-3: Whether Applicant adequately assessed the visual impact of the proposed project in the vicinity of the NHOTIC and properly determined the impact would be “less than significant.”

Id. pages 286-87 of 10016.

³³⁹ Carbiener Direct Test at 12-13.

Limited party Deschner has standing on Issue SR-3. Mr. Deschner provided direct testimony and signed statements in support of his position that the proposed facility would have a significant adverse visual impact at the NHOTIC. Deschner Direct Test. at 4. Mr. Deschner argued that the proposed mitigation via design features (including shorter, H-frame towers) is insufficient because the project will still be visible from the NHOTIC parcel. *Id.* at 5-10. In addition, Mr. Deschner challenged the Council's definition of the term "significant" in OAR 345-001-0010(52)³⁴⁰ and Idaho Power's methodology for assessing visual impacts. *Id.* at 7-8.

Both the Department and Idaho Power contend that Idaho Power used the appropriate definition of "significant" in evaluating visual impacts at the NHOTIC, and that Idaho Power appropriately applied that definition in its visual impact assessment. In addition, as discussed above with regard to Issue SR-2, the Department and Idaho Power assert that the evidence in the record is sufficient for the Council to determine that the proposed facility, taking into account the proposed mitigation, will comply with the Scenic Resources and Protected Area standards. ODOE Closing Brief at 196-97; Idaho Power Closing Arguments at 45-54.

Definition of "significant." Contrary to Mr. Deschner's contention, the Council's definition of "significant" does not muddy the meaning of the word. Where, as here, the Council has provided a specific definition for a term used in its rules, it is not appropriate to look to a dictionary to interpret that term. Indeed, OAR 345-001-0010 specifically states, "the following definitions apply unless the context requires otherwise or a term is specifically defined within a division or rule." With regard to the phrase "significant adverse impact" as used in the Scenic Resources standard, the Protected Areas standard, and other standards, the context does not require a different definition of "significant" than what is set out in the Council rule.

Furthermore, the evidentiary record belies Mr. Deschner's claim that Idaho Power bent or manipulated the meaning of "significant" to justify the proposed facility's placement in the area of the NHOTIC. The evidence establishes that the Company refined its impact assessment approach in response to the Department's request to consider the Council's definition of significant in its analysis.³⁴¹ Idaho Power also submitted its refined methodology to the Department for review and approval. In the Proposed Order, the Department set out its reasons for concurring with the Company's methodology for assessing visual impacts and recommended

³⁴⁰ OAR 345-001-0010(52) states:

"Significant" means having an important consequence, either alone or in combination with other factors, based upon the magnitude and likelihood of the impact on the affected human population or natural resources, or on the importance of the natural resource affected, considering the context of the action or impact, its intensity and the degree to which possible impacts are caused by the proposed action. Nothing in this definition is intended to require a statistical analysis of the magnitude or likelihood of a particular impact.

³⁴¹ ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 140 of 570.

that the Council do the same.³⁴² Consequently, Mr. Deschner has not shown that Idaho Power and/or the Department misconstrued the meaning of significant in evaluating the proposed facility's visual impacts.

Extent of adverse impact. Also contrary to Mr. Deschner's claim, Idaho Power has demonstrated, and the Department properly found, that the proposed facility's visual impacts at Flagstaff Hill/NHOTIC will be "less than significant." First, the fact that the proposed facility will be visible from the NHOTIC parcel does not, in and of itself, mean the proposed facility runs afoul of the Council's siting standards. Idaho Power does not need to demonstrate that the project is not likely to result in *any* adverse impact to scenic resources, only that with mitigation, the project is not likely to have a significant adverse impact. See OAR 345-022-0080(1); OAR 345-022-0040(1).

Second, as discussed above in connection with Issue SR-2, a preponderance of the evidence establishes that, taking into account mitigation, the proposed facility is likely to result in a medium adverse impact, rather than a significant adverse impact. After assessing potential impacts of the project at the NHOTIC parcel, taking into account the baseline conditions including the prior development within the landscape, Idaho Power determined that, absent mitigation, the project's visual impacts could potentially be significant.³⁴³ However, taking into account the proposed mitigation in the form of design changes (required by recommended Scenic Resources Condition 3),³⁴⁴ micrositing and tower placement, these potential impacts will be reduced to less than significant.

In summary, Idaho Power accurately assessed the visual impact of the proposed project in the vicinity of the NHOTIC and properly determined that the impact would be medium, meaning less than significant as defined by Council rule.

Ruling on Idaho Power's Motion to Strike Portions of Mr. Deschner's Closing Arguments:

In its Response Brief, Idaho Power moves to strike, or in the alternative, give no weight to certain statements and arguments in Mr. Deschner's Closing Argument on Issue SR-3. Idaho Power challenges portions of the brief that rely on evidence not in the record and/or that address an issue on which Mr. Deschner does not have standing. Specifically, Idaho Power challenges statements regarding the Company's visual impacts assessment methodology and statements relying on Idaho Power's Response to Mr. Deschner's Discovery Request No. 4. Idaho Power Motion to Strike for Issue SR-3 at 7-9.

Because Mr. Deschner did not timely offer Idaho Power's response to Discovery Request

³⁴² ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 279-280 of 10016.

³⁴³ ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 122 of 570.

³⁴⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 424 of 10016.

No. 4 into the evidentiary record, he may not rely on it as evidence in his closing argument. Furthermore, the ALJ agrees that Mr. Deschner's challenges to Idaho Power's visual assessment methodology are outside the scope of Issue SR-3, because Mr. Deschner did not raise the issue in his comments on the DPO.³⁴⁵ Consequently, in accordance with Idaho Power's request, the ALJ gives no weight to those statements in Mr. Deschner's closing brief that are not supported by evidence in the record and/or arguments that are outside the scope of Issue SR-3.

Issue SR-7: Whether the methods used to determine the extent of an adverse impact of the proposed facility on scenic resources, protected area and recreation along the Oregon Trail were flawed and developed without peer review and/or public input. Specifically, whether Applicant erred in applying numeric values to the adverse impact and whether Applicant used unsatisfactory measurement locations/observation points in its visual impact assessment.

Limited parties Lois Barry and STOP B2H have standing on Issue SR-7. In her direct testimony, Ms. Barry challenged Idaho Power's methodology for assessing the proposed facility's visual impacts at scenic resources. She argued that Idaho Power did not follow the procedures and methods in the USFS 1995 publication, *Landscape Aesthetics: A Handbook for Scenery Management (SMS)*, and did not consider constituent users' subjective evaluations of the resource. STOP B2H/Barry Direct Test. at 1-2. In the Closing Argument, STOP B2H also argued that Idaho Power's visual impact assessment for the NHOTIC fails to meet the requirements of the Scenic Resources and Protected Areas standards. STOP B2H asserts that Idaho Power's methodology was flawed because it did not include any constituent information and/or consider the impact on the affected human population. STOP B2H Closing Argument at 22. STOP B2H further argues that the Department "has not been appropriately attentive" in its review and erred in approving Idaho Power's methodology for assessing visual impacts.³⁴⁶ *Id.* at 23-24.

The Department and Idaho Power assert that Idaho Power used acceptable methods to assess visual impacts to scenic resources, protected areas, and recreation resources. Idaho Power adds that, contrary to the limited parties' contention, the Company could not apply the SMS methodology under the Council's standards, because the Department specifically requested that the Company use a methodology that applied the Council's definition of "significance." Idaho Power Response Issue SR-7 at 17.

For the reasons that follow, the ALJ finds that methods Idaho Power used to determine the extent of adverse impact of the proposed facility on scenic resources, protected areas, and recreation along the Oregon Trail were reasonable and appropriate. First, the Council's rules do

³⁴⁵ The ALJ notes that other limited parties' challenges to Idaho Power's visual assessment methodology are addressed in the *Ruling and Order on Motion for Summary Determination of Contested Case Issue SR-6* as well as Issue SR-7 below.

³⁴⁶ Neither STOP B2H nor Ms. Barry submitted evidence or argument in support of the second part of Issue SR-7, *i.e.*, whether Idaho Power used unsatisfactory key observation points in its visual impact assessment. Because the limited parties did not present evidence or argument on their challenge to the sufficiency of the selected KOP locations, the ALJ considers this sub-issue waived.

not require that an applicant employ a specific methodology for assessing visual impacts. The Council's standards simply require that the applicant demonstrate that the proposed facility is not likely to result in significant adverse impacts to identified resources. Therefore, Idaho Power had no legal obligation to collect constituent information in accordance with the SMS to demonstrate compliance with the Scenic Resources, Protected Areas, and/or Recreation standard.

Second, and contrary to STOP B2H's assertion, Idaho Power explained its methodology for assessing visual impacts in detail in ASC Exhibit R, Attachment R-1. As discussed above, Idaho Power developed this methodology following the Department's request that Idaho Power consider the Council's definition of significant in assessing visual impact.³⁴⁷ In the ASC, Idaho Power explained that its methodology incorporated relevant elements from the SMS to assess the baseline scenic conditions in forested areas and elements from the BLM's VRM to assess baseline scenic conditions in non-forested areas. Idaho Power also incorporated the BLM visual "sensitivity level" criterion and the SMS visual "concern" criterion into its methodology, both of which measure the degree to which viewers subjectively value a visual resource.³⁴⁸ Instead of collecting data on viewers' subjective perceptions of the proposed facility's potential impacts, Idaho Power assumed that all viewers (including all visitors to the NHOTIC) would be highly sensitive to the resource change.

The ALJ finds that because Idaho Power attached the highest viewer sensitivity value to all of the resources evaluated, data collection on viewers' subjective evaluations is unnecessary. Indeed, because Idaho Power assumed a high sensitivity among all viewer groups, additional constituent information would not add to, but could potentially reduce, the value that Idaho Power attributed to the affected resources. By assuming the highest viewer sensitivity, Idaho Power's methodology adequately addressed the impacts "on the affected human population" as required by OAR 345-001-0010(53). Consequently, contrary to the limited parties' contentions, Idaho Power's methodology for assessing the project's visual impacts does not run afoul of the Council's Scenic Resources, Protected Areas, and Recreation standards.

To the extent the limited parties assert that Idaho Power's methodology is "a self-serving piecemeal approach," and that the Company manipulated the methodology to yield desired results, the ALJ notes that, with regard to the Oregon Trail ACEC – NHOTIC parcel, the Company's assessment determined that *without mitigation*, the project could result in potentially significant visual impacts at various points.³⁴⁹ However, Idaho Power also determined, and the

³⁴⁷ ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, page 140 of 570.

³⁴⁸ *Id.* at page 147 of 570.

³⁴⁹ See ODOE - B2HAPPDoc3-35 ASC 18_Exhibit R_Scenic Resources_ASC 2018-09-28, pages 122 and 228-232 of 570. In ASC Exhibit R, Idaho Power stated as follows:

In evaluating various alternatives for Project siting, IPC concluded that potentially significant visual impacts from facility structures located directly west of the NHOTIC (corresponding to the Flagstaff Alternative) could result. To address potential impacts, IPC analyzed three design options aimed at reducing adverse impact to less than significant: To address potential impacts, IPC analyzed three design options aimed at reducing adverse impact to less than significant: (1) applying a natina finish to the lattice

Department concurred, that *with mitigation*, visual impacts to the NHOTIC will be medium intensity, resulting from both medium resource change and viewer perception.³⁵⁰

Finally, the limited parties have not shown that the Department was “inattentive” in its review of Idaho Power’s methodology for determining the extent of the proposed facility’s impacts on scenic, protected, or recreational resources. As discussed above, the Department thoroughly reviewed Idaho Power’s methodology for consistency with the Council’s standards and provided feedback, asking that the Company consider the Council’s definition of significant in its analysis. In the Proposed Order, the Department outlined the methodology, expressed concurrence with the methodology, and stated the reasons for its concurrence.³⁵¹ There is no Council rule that requires an applicant to have its impact assessment methodologies peer reviewed and/or subjected to public input during development. As the Department noted in its Closing Brief, although the limited parties may have preferred that Idaho Power adopt a different methodology to assess visual impacts of the proposed facility, the Council’s standards do not require that the Company do so.

In summary, the methodology Idaho Power used to determine the extent of adverse impact of the proposed facility on scenic resources, protected areas, and recreation along the Oregon Trail was reasonable and appropriate. The limited parties have not shown that the methodology was flawed, that Idaho Power erred in applying numeric values to the adverse impact, and/or that the Company used unsatisfactory measurement locations/observation points in its visual impact assessment.

Proposed site certificate conditions related to Issue SR-7:

In its Closing Argument on Issue SR-7, STOP B2H proposes a site certificate condition requiring Idaho Power to underground the transmission line for 1.7 miles in the area the NHOTIC as a mitigation measure to ensure compliance with the Scenic Resources standard. The proposed condition is neither necessary nor appropriate. As discussed above in connection with Issue SR-2, the Council lacks jurisdiction to require Idaho Power to underground the project segment near the NHOTIC. Consequently, this proposed site certificate condition is denied.

structure; (2) using an H-frame structure with galvanized finish; or, (3) using an H-frame structure with a natina finish. These mitigation strategies were considered for six transmission tower structures located directly west and within 1,200 feet of the NHOTIC boundary. Because of the terrain backdrop, IPC selected the H-frame structure with the weathered steel surface treatment, as it was expected to reduce the visual contrast below that of the standard galvanized structures.

Id. at 122-23 of 570.

³⁵⁰ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 283-84 of 10016.

³⁵¹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 279-280 of 10016.

Ruling on Idaho Power's Motion to Strike Portions of STOP B2H's Closing Arguments on Issue SR-7:

In its Response Brief, Idaho Power moves to strike, or in the alternative, give no weight to certain statements in STOP B2H's Closing Argument on Issue SR-7. Idaho Power challenges portions of the brief that address an issue outside the scope of Issue SR-7 and/or that seek to relitigate an issue already resolved through summary determination. Specifically, Idaho Power challenges statements asserting that the Company should have applied federal scenic resource inventorying methods to assess visual impacts and all statements asserting that Idaho Power was required to survey visitor's subjective evaluations of visual impacts. Idaho Power Motion to Strike for Issue SR-7 at 3-6. In opposing the motion, STOP B2H asserts that the heart of Issue SR-7 is whether Idaho Power's methodology for evaluating scenic resources was flawed, and therefore the challenged statements are within the scope of the issue. STOP B2H Opposition at 1-2.

As discussed above, there is significant overlap between Issue SR-6,³⁵² which was resolved in Idaho Power's favor, and Issue SR-7. Both issues boil down to the same question—whether the Council's standards require that Idaho Power incorporate viewers' subjective evaluation of their resources. The ALJ agrees with STOP B2H that Issue SR-7 includes a challenge to the validity of Idaho Power's methodology for assessing visual impacts. Because the challenged statements in STOP B2H's closing arguments fall within the scope of Issue SR-7, Idaho Power's motion to strike these statements is denied.

Soil Protection Standard

OAR 345-022-0022, the Soil Protection standard, states:

To issue a site certificate, the Council must find that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in a significant adverse impact to soils including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.

Issue SP-1: Whether the Soil Protection Standard and General Standard of Review require an evaluation of soil compaction, loss of soil structure and infiltration, and loss of stored carbon in the soil and loss of soil productivity as a result of the release of stored carbon in soils.

³⁵² Issue SR-6 asked, in part, "whether Applicant's visual impact assessments are invalid because Applicant did not incorporate Oregonians' subjective evaluation of their resources." In the *Ruling and Order on Motion for Summary Determination of Contested Case Issue SR-6*, the ALJ found that: (1) the Council's rules do not require an applicant to employ a specific methodology for assessing visual impacts and (2) the lack of specific constituent information (the failure to incorporate viewers' subjective evaluations) does not invalidate the visual impact assessments.

Limited parties Dr. Suzanne Fouty and STOP B2H have standing on Issue SP-1.³⁵³ Dr. Fouty contends that the Soil Protection standard is broader in scope than impacts to soils from erosion and chemical factors and that the Council's rules require that the applicant do an in-depth, detailed analysis of the project's impacts on soil productivity.³⁵⁴ She also argues that Idaho Power's analysis of the project's impacts to soil is insufficient to demonstrate compliance with the Soil Protection standard and that Idaho Power has failed to show the effectiveness of its proposed mitigation strategies. Fouty Closing Brief at 2-3, 14, 29, 40, 45-50.

Both the Department and Idaho Power maintain that the Council's review under the Soil Protection standard is not as broad, or as granular, as Dr. Fouty asserts. Both the Department and Idaho Power contend that Dr. Fouty is demanding more information and analysis than what is required under the Council's rules.³⁵⁵ Both the Department and Idaho Power also assert that Idaho Power has presented in ASC Exhibit I sufficient evidence and information to demonstrate that the design, construction and operation of the facility, taking into account mitigation, are not likely to result in a significant adverse impact to soils.³⁵⁶ Additionally, Idaho Power asserts that, in her Closing Brief, Dr. Fouty raises other concerns that are outside the scope of Issue SP-1.³⁵⁷ For the reasons that follow, the ALJ agrees with the Department and Idaho Power. The Council's standards do not require the impact evaluations proposed by Dr. Fouty.

Scope of the Soil Protection standard. Dr. Fouty argues that "the intent of the Soil Protection standard is to protect soil productivity" and therefore the standard requires an applicant to address any and all impacts that may adversely impact soils. Fouty Closing Brief at 22. However, contrary to Dr. Fouty's contention, the purpose of the Soil Protection standard is not to protect soil productivity. Rather, the standard requires the Council to find that, taking into account mitigation, the design, construction and operation of the proposed energy facility are not likely to result in a significant adverse impact to soils.

Dr. Fouty argues that because the Soil Protection standard states "significant adverse impacts to soils *including, but not limited to, * * **" the Council must evaluate any and all types of impacts the proposed facility may potentially have on soils within the analysis area. However, there is no support in law or in fact for Dr. Fouty's broad reading of OAR 345-022-0022. Where, as here, the text of a statute or rule includes a list that begins with "including, but not

³⁵³ In lieu of filing duplicative documents, STOP B2H adopted Dr. Fouty's testimony and arguments as its own with regard to Issue SP-1. *See, e.g.*, STOP B2H Coalition: Notice of Adoption of Testimony on Issue SP-1, filed September 17, 2021 and December 3, 2021.

³⁵⁴ Dr. Fouty asserts that other impacts to soil that can have a significant adverse impact to the productivity of a soil are soil compaction, loss of stored carbon, and loss of topsoil. *See* Fouty Closing Brief at 2-3, 10-11; *see also* Fouty Direct Test. at 10.

³⁵⁵ *See* ODOE Response to Closing Arguments at 128-31; Idaho Power's Closing Argument on Issue SP-1 at 2, 9-29; Idaho Power's Response Brief at 33-34.

³⁵⁶ ODOE Closing Brief at 203-05; Idaho Power's Closing Argument on Issue SP-1 at 6-9.

³⁵⁷ Idaho Power's Response Brief at 14-34.

limited to,” a court tasked with interpreting that statute or rule should look to the listed examples that follow to find a common characteristic in defining the scope of the general term.³⁵⁸ Therefore, in this context, the scope of “impact to soils” must be considered in light of basic characteristics of the specific examples that follow that term, *i.e.*, erosion and deposition or application of chemical substances. In other words, applying accepted principles of statutory construction, the Soil Protection standard requires the Council to evaluate “impacts to soils” that are typically assessed and addressed as part of the construction and operation of energy facilities. Those impacts include wind and rain erosion resulting from ground disturbing construction activities, application of effluent on surrounding soils during facility operation, chemical or hazardous substance spills, and salt deposition from cooling towers.

While the Department or the Council *may* request in the project order that an applicant provide information and evaluations of other impacts to soil (such as soil compaction, loss of structure and infiltration, loss of stored carbon, and/or loss of productivity), the plain language of the Soil Protection standard does not require the applicant to provide such detail and analysis in every site certificate application.³⁵⁹ Indeed, OAR 345-021-0010(1)(i) simply directs the applicant to provide “information from reasonably available sources regarding soil conditions and uses in the analysis area.” Neither the ASC content rule nor the Soil Protection standard require that the applicant present the highest level of detail, from the most current sources, or the best available science. The Council rules also do not require the applicant provide site-specific mitigation in the ASC.

Sufficiency of ASC Exhibit I and Idaho Power's analysis of impacts to soil. Dr. Fouty makes three arguments in challenging the sufficiency of ASC Exhibit 1. First, she contends that Idaho Power incorrectly identified the soil analysis area to minimize the facility's impacts. Fouty Closing Brief at 16-18. Second, she asserts that Idaho Power incorrectly used STATSGO (as opposed to SSURGO) as its primary database for identifying soil types. *Id.* at 18-20. Third, she argues that Idaho Power failed to identify and analyze the dynamic soil properties of the soil that would be disturbed and describe the mitigation needed to restore the soil to preconstruction condition. *Id.* at 20-21, 33-38.

Contrary to Dr. Fouty's contention, Idaho Power correctly identified the soil analysis area for purposes of ASC Exhibit 1 as the area within the site boundary in accordance with the Project Order. The areas of disturbance, *i.e.*, the soil potentially impacted by the construction and

³⁵⁸ See, e.g., *State v. Kurtz*, 350 Or 65, 75-76 (2011); *Schmidt v. Mt. Angel Abbey*, 347 Or 389, 404-06 (2009) (“when using the principle of *ejusdem generis*, the court seeks to find, if it can, a common characteristic among the listed examples. We then determine whether the conduct at issue, even though not one of the listed examples, contains that characteristic and, thus, falls within the intended meaning of the general term.”)

³⁵⁹ Indeed, in the Second Amended Project Order, the Department directed Idaho Power to “[d]escribe all measures proposed to maintain soil productivity during construction and operation” and to include the required evidence related to the NPDES 1200-C permit application. ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 14.

operation of the facility, are subsets within the site boundary/soil analysis area.³⁶⁰ Second, there is nothing in the Council's rules requiring the applicant to use a specific methodology for identifying soil types within the analysis area. In ASC Exhibit 1, Idaho Power explained its methods for identifying soil properties and its use of the STATSGO database to characterize soil erosion and soil reclamation properties.³⁶¹ Idaho Power also explained its use of the SSURGO soils data to identify soils within the analysis area the potential for agricultural use. Idaho Power acknowledged that SSURGO data includes more detailed soil properties information based on smaller map units than the STATSGO data; however the SSURGO data did not provide complete coverage of the site boundary. Idaho Power also explained that it used the SSURGO database only if similar data were not available in STATSGO.³⁶² On this record, Dr. Fouty has not demonstrated that Idaho Power was required to use the SSURGO database to determine soil properties and/or that the Company failed to use information from reasonably available sources to identify and describe the major soil types in the analysis area.

Dr. Fouty also has not shown that Idaho Power's soil data analysis was flawed because the Company did not identify and analyze the dynamic properties of the soil that would be disturbed and describe the mitigation needed to restore the soil to preconstruction condition. As previously discussed, the ASC content rule requires the "identification and description of the major soil types in the analysis area." OAR 345-021-0010(1)(i)(A). In ASC Exhibit 1, Idaho Power not only identified and described the major soil types per county within the analysis area, but also presented soil mapping units along the entire transmission line corridor within the analysis area.³⁶³ Furthermore, in response to Dr. Fouty's request, Idaho Power provided an updated Table I-2-1, presenting soils information by county with the soil order, soil ID, soil name, acreage, percent and acreage of disturbance area, and soil properties.³⁶⁴ Nothing in the Council's rules or in the Project Order requires Idaho Power to provide a more granular description and analysis of soil properties to demonstrate compliance with the Soil Protection standard.

Sufficiency of proposed mitigation. Finally, Dr. Fouty argues that Idaho Power has not shown the proposed mitigation will be "effective and rapid" in returning the disturbed soil to preconstruction condition.³⁶⁵ She asserts that Idaho Power must provide site-specific mitigation

³⁶⁰ See Madison Cross-Exam. Test. Tr. Day 2 at 31, lines 1-2, explaining, "the construction area is a subset of the site boundary."

³⁶¹ ODOE - B2HAPPDoc3-16 ASC 09a_Exhibit I_Soil_ASC_Part 1 2018-09-28, page 7 of 115.

³⁶² ODOE - B2HAPPDoc3-16 ASC 09a_Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 7-12 of 115.

³⁶³ ODOE - B2HAPPDoc3-16 ASC 09a_Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 42-68 of 115; see also ODOE - B2HAPPDoc3-17 ASC 09b_Exhibit I_Soil_ASC_Part 2 2018-09-28, pages 69-72 of 88 (original Table I-2-1, showing the soil mapping units per county).

³⁶⁴ Madison Rebuttal Test. at 52-53; Madison Rebuttal Exhibit D.

³⁶⁵ More specifically, Dr. Fouty argues that for the Council to find that, with mitigation, the facility is not likely to result in significant adverse impacts to soils, Idaho Power must demonstrate that the proposed mitigations "will be effective and rapid (*i.e.* seeding, ripping, soil amendments, etc.)." *Id.* at 46. She

information and a specific timeframe for reclamation. She also contends that Idaho Power's reliance on vegetative recovery is not an appropriate measure of soil productivity recovery. Fouty Closing at 22-24, 41-47, 58-59.

As an initial matter, Idaho Power responds, and the ALJ agrees, that these mitigation concerns are beyond the scope of Issue SP-1. Issue SP-1 focuses on the extent to which the Council's standards require an evaluation of soil properties and not on the nature or quality of proposed mitigation measures. Nevertheless, for the Council's benefit, the ALJ briefly addresses Dr. Fouty's concerns.

The Soil Protection standard does not prohibit impacts to soils, whether the soil is productive or non-productive. Nor does the standard require an applicant to establish a specific timeframe for recovery or to establish quantitative measures for soil reclamation to demonstrate compliance with the Soil Protection standard. Rather, the standard requires that an applicant demonstrate that it has evaluated the potential impacts to soils from proposed facility construction and operation and that it has methods to mitigate adverse impacts to less than significant. As discussed above, the ASC content rule requires that the applicant submit information from reasonably available sources *describing* any measures the applicant proposes to avoid or mitigate adverse impacts to soils. OAR 345-021-0010(1)(i)(D). The Soil Protection standard specifically allows consideration of an applicant's proposed mitigation to make findings of compliance, but it does not require the applicant to provide proof that the mitigation will be rapid and completely effective.

In ASC Exhibit A, Idaho Power described its proposed mitigation measures, which include the following: avoidance of sensitive soils; minimizing impacts with BMPs; minimizing impacts of spills; reseeding and watering to mitigate for wind erosion; applying BMPs to mitigate for soil compaction; replacing topsoil and reestablishing vegetation as appropriate for the locations; cooperating and consulting with agencies and landowners; applying BMPs to control weeds; and adhering to federal agency land use plans on impacted federal lands.³⁶⁶ Notwithstanding Dr. Fouty's arguments, it is reasonable, and consistent with industry standards, for Idaho Power to rely on agency-issued BMPs to mitigate adverse impacts. The Department reviewed ASC Exhibit I and concluded that it sufficiently described Idaho Power's avoidance and mitigation measures and that the described measures are not likely to result in a significant adverse impact to soils.³⁶⁷ Dr. Fouty has not established otherwise.

Moreover, the recommended site certificate conditions in the Proposed Order related to soil protection and the various mitigation plans addressed within those conditions require that

contends that Idaho Power did not provide documentation of the effectiveness of its proposed mitigations to recover lost soil productivity. *Id.*

³⁶⁶ ODOE - B2HAPPDoc3-16 ASC 09a_Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 28-36 of 115; Madison Rebuttal Test. at 23-34.

³⁶⁷ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 109-10 of 10016.

Idaho Power provide site-specific mitigation information and that the Company have in place various finalized plans designed to ensure that temporary adverse impacts to soil are minimized. For example, Recommended Soil Protection Condition 1 requires Idaho Power to obtain a NPDES 1200-C permit and to have and comply with an approved Erosion and Sediment Control Plan. Recommended Soil Protection Conditions 2 and 3 require Idaho Power to have and comply with an approved SPCC Plan for construction and, if necessary, operation. Other recommended conditions require Idaho Power to have and comply with an approved Blasting Plan, to monitor and inspect facility components for soil impacts, and to have and comply with an approved Agricultural Impacts Mitigation Plan and an approved Reclamation and Revegetation Plan.³⁶⁸

The Department appropriately concluded that the mitigation plans that apply to agricultural restoration, revegetation and restoration, combined with the DEQ 1200-C permit, are more than adequate to ensure that appropriate measures are implemented pre- and post-construction to ensure soil restoration. Again, Dr. Fouty has not demonstrated otherwise.

*Proposed site certificate condition related to the Soil Protection Standard:*³⁶⁹

In her Closing Brief, Dr. Fouty proposed a site certificate condition requiring that “prior to approval of the site application a project level soils analysis must be done and then evaluated for compliance with the Soil Protection standard.”³⁷⁰ Based on the discussion of Issue SP-1 above, it is evident that the proposed condition is unnecessary for compliance with the Soil Protection standard.

Ruling on Idaho Power’s Motion to Strike portions of Dr. Fouty’s Closing Brief on Issue SP-1:

As part of its Response Brief, Idaho Power moves to strike, or in the alternative asks that the ALJ give no weight to, statements from Dr. Fouty’s Closing Brief that are testimonial in

³⁶⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 104-109 of 10016; *see also* Madison Rebuttal Test. at 23-29.

³⁶⁹ In its Rebuttal to Direct Testimony, the Department recommended a new soil protection condition (ODOE Proposed Soil Protection Condition XX) requiring Idaho Power to, at least 12 months prior to construction, develop and submit a Soil Impact Mitigation Protocol specific to temporary disturbance areas. ODOE Rebuttal to Direct Testimony at 116. However, in its Closing Brief, the Department withdrew this proposed condition and instead proposed that language be adopted into the draft Reclamation and Revegetation Plan designed to further support successful restoration of temporary soil impacts. *See* ODOE Closing Brief at 202-203. Because the Department withdrew its previous recommended condition, it is not addressed herein.

³⁷⁰ Dr. Fouty also proposed specific elements and methodology for the soils analysis. Fouty Closing Brief at 61.

nature and/or reference documents not admitted into the evidentiary record. Specifically, Idaho Power moves to strike: (a) statements referencing and relying on National Resources Conservation Services (NRCS) data that is not part of the evidentiary record; (b) statements referencing and relying on Federal Resource Management Plans (the 1990 Wallowa-Whitman National Forest Land Resource Management Plan, the 1989 BLM Baker Resource Management Plan Record of Decision, and the 2002 BLM Southeastern Oregon Resource Management Plan and Record of Decision) that are not part of the evidentiary record; and (c) statements of opinion or analysis that are not included in or supported by Dr. Fouty's direct or surrebuttal testimony.³⁷¹

Dr. Fouty filed an opposition to Idaho Power's motion, asserting that the motion was not authorized and without merit because (with the exception of Figure 1 in the brief) all the challenged information in her Closing Brief is accessible, fixed, and relevant to Issue SP-1 and the Soil Protection standard. Fouty Opposition to Late Motion to Strike at 1-2.

The ALJ rejects Dr. Fouty's procedural challenge to Idaho Power's motion. As previously discussed, the applicable procedural rules authorize parties, including limited parties, to submit motions seeking an order or other relief. OAR 345-015-0054(1). On the substance of the motion, the ALJ agrees that with Idaho Power the challenged portions of Dr. Fouty's Closing Brief are testimonial in nature and/or reference documents not admitted into the evidentiary record. The Table of Additional Admitted Evidence (Appendix 1), sets out the additional evidence admitted into the hearing evidentiary record as of January 31, 2022. The NRCS data and the Federal Resource Management Plans referenced in Dr. Fouty's Closing Brief are not part of the B2H Project Record or listed in the Table of Additional Admitted Evidence, and therefore are not part of the evidentiary record. However, considering the logistical challenges and inefficiency of carving up the brief, the ALJ declines to strike the challenged statements. Instead, because the evidentiary record does not support the challenged statements, the ALJ grants Idaho Power's alternate request and gives these statements no weight.

Ruling on Idaho Power's Motion to Strike Portions of Dr. Fouty's Response Brief on Issue SP-1:

In its Motion, Idaho Power moves to strike or, alternatively, asks that no weight be given to the following portions of Dr. Fouty's Response Brief: Figures A-1 and A-2 and statements made in reliance of NRCS data not in the record; statements made in reliance of Federal Resource Management Plans; statements made in reliance on the Third Oregon Climate Assessment Report; and any testimonial statements made with no reference to the existing record. Motion at 17-21.

In her opposition to Idaho Power's motion, Dr. Fouty asserts that the NRCS database, the Federal Resource Management Plans, and the Third Oregon Climate Assessment Report are part of the evidentiary record because these sources are cited in the ASC and/or referenced in the Proposed Order and attachments thereto. She argues that the references to these sources in the B2H Project Record documents makes the sources part of the record in their entirety. Fouty

³⁷¹ In Attachment A to Idaho Power's Response Brief and Motion to Strike for Issue SP-1, Idaho Power identifies approximately 20 pages of statements in Ms. Fouty's Closing Brief that are testimonial in nature and not supported by evidence in the record.

Response at 1. Dr. Fouty is incorrect on this point. A citation to, or excerpt from, a database, report, or management plan in the ASC or Proposed Order does not make the entirety of that database, report, or management plan part of the evidentiary record of the contested case. As discussed previously, the evidentiary record consists of the B2H Project Record (as marked with a Doc ID number assigned by the Department) and the documents listed in the Table of Additional Admitted Evidence. Contrary to Dr. Fouty's contention, if the referenced information from the database, report, or management plan is not included in the B2H Project Record or not listed as an exhibit in the Table of Additional Admitted Evidence, then that information is not part of the evidentiary record.

The ALJ agrees with Idaho Power that challenged statements in Ms. Fouty's Response Brief are based on information that is not part of the evidentiary record. For the reasons previously explained, the ALJ gives the challenged figures and statements no weight.

Structural Standard

OAR 345-022-0020, the Structural Standard states, in pertinent part:

[T]o issue a site certificate, the Council must find that:

- (a) The applicant, through appropriate site-specific study, has adequately characterized the seismic hazard risk of the site; and
- (b) The applicant can design, engineer, and construct the facility to avoid dangers to human safety and the environment presented by seismic hazards affecting the site, as identified in subsection (1)(a);
- (c) The applicant, through appropriate site-specific study, has adequately characterized the potential geological and soils hazards of the site and its vicinity that could, in the absence of a seismic event, adversely affect, or be aggravated by, the construction and operation of the proposed facility; and
- (d) The applicant can design, engineer and construct the facility to avoid dangers to human safety and the environment presented by the hazards identified in subsection (c).

Flooding risk – Issue SS-2

Issue SS-2: Whether Applicant adequately analyzed the risk of flooding in areas adjacent to the proposed transmission line arising out of the construction-related blasting. Whether Applicant should be required to evaluate hydrology, including more detailed and accurate mapping of existing creeks and ditches that drain into streets and private property, and core samples of sufficient variety and depth to determine the flooding risk to neighborhoods of south and west La Grande.

Limited party Cooper has standing on Issue SS-2. Mr. Cooper did not file any written direct testimony or supporting exhibits for this issue.³⁷² However, he submitted closing argument asserting that construction-related blasting and road building are likely to exacerbate problems with storm water drainage.³⁷³ Mr. Cooper also asserted that “road building, blasting, and earth moving activities threaten to cause erosion and sedimentation in the south and west hills, worsening the possibility of flooding in the Mill Creek, Miller Creek, and Deal Creek drainages.” Cooper Closing Brief on Issue SS-2 Flooding at 4.

As noted, Mr. Cooper did not present any facts or evidence to support his claim that construction related activities, including blasting, will result in significant flooding and property damage. The preponderance of the evidence in this record establishes otherwise. In the ASC, Idaho Power adequately characterized the risk of flooding and established that it can design, engineer, and construct the facility to avoid dangers posed by potential flooding hazards. As Idaho Power’s blasting consultant and expert Mr. Cummings explained, it is unlikely that construction-related blasting will reroute waterways and/or increase flooding risks. In the Proposed Order, the Department found that Recommended Structural Standard Condition 1 would require the pre-construction site specific geological and geotechnical investigation report to identify facility components within the 100-year flood zone, any related potential risk to the facility, and measures to mitigate the identified hazards. To require Idaho Power to take core samples prior to selection of the final route is not practical nor required by the Council’s rules.

Proposed Site Certificate Conditions related to Issue SS-2.

In his closing argument, Mr. Cooper proposed two new site certificate conditions. The first requires Idaho Power to conduct further analysis of storm water runoff from the proposed facility and the second requires further analysis of hydrology. Cooper Closing Brief on Issue SS-2 Flooding at 6. Mr. Cooper did not timely submit these proposed site certificate conditions to the ALJ in accordance with the schedule set in the *Case Management Order*³⁷⁴ nor did he timely present evidence in support of these proposed conditions. Because Mr. Cooper did not submit

³⁷² See *Ruling on Motion to Dismiss* at 14-15.

³⁷³ In his closing argument on Issue SS-2, Mr. Cooper also contends that the proposed project violates the Public Services Standard because that standard requires, among other things, a finding that the construction and operation “are not likely to result in a significant adverse impact to the ability of public and private providers within the analysis area * * * to provide * * * storm water drainage.” OAR 345-022-0110(1). This argument falls outside the scope of Issue SS-2, which is limited to concerns about Idaho Power’s identification and mitigation of soil-related and geologic hazards, including flooding, landslides, and erosion. Because Mr. Cooper was not granted limited party status on the issue of storm water drainage under the Public Services Standard, the ALJ declines to address this challenge. See *Amended Order on Party Status* at pages 37-38 (discussing the issues properly raised by Mr. Cooper).

³⁷⁴ Pursuant to OAR 345-015-0085(1), “parties shall submit proposed site certificate conditions to the hearing officer in writing according to a schedule set by the hearing officer.” In this matter, the deadline for submitting written direct testimony, evidence, and any proposed site certificate conditions was September 17, 2021. *Case Management Order* at 16, 18.

these proposed conditions in a timely manner, the ALJ declines to address their necessity or appropriateness.

Ruling on Idaho Power's Motion to Strike portions of Mr. Cooper's Closing Brief on Issue SS-2:

As part of its Response Brief, Idaho Power moves to strike statements from Mr. Cooper's Closing Brief on Issue SS-2 that reference or rely on documents not admitted into the evidentiary record. The ALJ acknowledges that Mr. Cooper did not timely file any direct testimony or exhibits in support of Issue SS-2, and that based on the *Ruling on Motion to Dismiss*, any references to evidence other than specified documents in the B2H Project Record "will not be excluded and considered."³⁷⁵ Instead of striking this testimony from the brief, the ALJ gives the challenged statements no weight.

Blasting concerns – Issues SS-1, SS-3 and SS-5

Issue SS-1: Whether Design Feature 32 of the Proposed Order Attachment G-5 (Draft Framework Blasting Plan) should be a site certificate condition to ensure repair of landowner springs from damage caused by blasting.

Limited party Stacia Webster has standing on Issue SS-1, and bears the burden of producing evidence to support her claim. Ms. Webster did not file any written direct testimony or exhibits in support of her position on Issue SS-1 nor did she submit written closing argument regarding this issue. Because Ms. Webster failed to submit evidence and/or argument in support of her contention that Design Feature 32 of the Framework Blasting Plan should be a site certificate condition, the ALJ considers the claim unsubstantiated.³⁷⁶ The findings in the Proposed Order pertaining to this issue constitute *prima facie* evidence of Idaho Power's compliance with the Structural standard.

Idaho Power's proposed site certificate condition related to Issue SS-1

Notwithstanding Ms. Webster's failure to substantiate this claim, Idaho Power has agreed to incorporate the requirements of Design Feature 32 into a site condition. Based on Idaho Power's agreement and the Department's concurrence, the ALJ recommends that Soil Protection Condition 4 be revised as follows:³⁷⁷

Amended Recommended Soil Protection Condition 4:

- a. Prior to construction, in accordance with the OAR 345-025-0016 agency consultation process outlined in the draft Framework Blasting Plan (Attachment

³⁷⁵ *Ruling on Motion to Dismiss* at 15.

³⁷⁶ Because Issue SS-1 is unsubstantiated, there is no need to address the merits of the claim in this order. See *Ruling on Motion to Dismiss* at 13.

³⁷⁷ Revisions in bold font.

20 G-5 of the Final Order on the ASC), the certificate holder shall finalize, and submit to the Department for approval, a final Blasting Plan. The final Blasting Plan shall meet all applicable federal, state and local requirements related to the transportation, storage, and use of explosives.

b. Prior to construction, the certificate holder will consult with landowners regarding right-of-way acquisition, and during these consultations, the certificate holder will discuss with the landowner any blasting that the certificate holder plans to conduct on the landowner's property. If the landowner identifies a natural spring or well on the property, the certificate holder will notify the landowner that at the landowner's request, the certificate holder shall conduct pre-blasting baseline flow and water quality measurements for turbidity. The certificate holder shall compensate the landowner for adequate repair or replacement if damages to the flow or quality of the natural spring or well occur solely as a result of blasting.

c. During construction, the certificate holder shall conduct all work in compliance with the final Blasting Plan approved by the Department.

Ms. Webster's proposed site certificate condition related to the Framework Blasting Plan:

In her direct witness testimony related to Issue PS-10, Ms. Webster proposed that the following condition be added to the Framework Blasting Plan (Proposed Order Attachment G-5) as well as the FSP Plan (Proposed Order, Attachment U-3): "During blasting Idaho Power will provide a water tender staffed by a crew of at least two personnel." Webster Direct Test. Issue PS-10 at 14-15. Ms. Webster asserted that during construction blasting, one person working a water tender will not be sufficient to alert the blasting crew, summon assistance, report the fire to the local fire agency, and suppress the fire. *Id.*

Ms. Webster presented no evidence in support of her claim that the Fire Safety provisions of the Framework Blasting Plan are insufficient, and that construction contractors must have a water tender staffed by a crew of at least two firewatch/fire suppression personnel during blasting activities. In the absence of such evidence, this proposed condition is denied.

Issue SS-3: Whether Applicant should be required to test the water quality of private water wells to ensure that construction-related activities are not impacting water quality and quantity.

Limited parties Horst and Cavinato have standing on Issue SS-3. As discussed previously, Mr. Horst and Ms. Cavinato reside in a home on an unpaved portion of Hawthorne Drive, just outside the city limits of La Grande. In Issue SS-3, they raise concerns about the impact that construction-related blasting (and construction-related traffic) could have on a deep water well on their property, located about 10 feet from a gravel road that contractors may use to access the power lines and a tensioning station. The limited parties request that Idaho Power test

the well water before, during and after construction and/or that the Company build a new road to detour construction-related traffic away from their property. Horst Closing Statement at 8-9.

Although Mr. Horst raised concerns that blasting and construction vehicles will damage the well on his property, he did not provide any evidence to support this concern. Idaho Power, on the other hand, presented evidence from a geological engineering expert and blasting consultant (Robert Cummings) that it is highly unlikely blasting or construction related traffic would cause damage to the well and therefore it is not necessary to test the well water before, during, and after construction of the facility.³⁷⁸ Based on the persuasive testimony provided by Mr. Cummings, there is no reason to conclude that blasting activities would impact well water quality on Mr. Horst's property given the geotechnical testing and site-specific reconnaissance to be undertaken prior to blasting and the safety measures required by the Framework Blasting Plan. Furthermore, as discussed previously, the requirements of the Framework Blasting Plan, Design Feature 32 are to be incorporated into a site condition. Accordingly, prior to construction, Idaho Power will be required to consult with landowners regarding any blasting to be conducted on the landowner's property. At the landowner's request, Idaho Power will conduct pre-blasting baseline flow and water-quality measurements, testing specifically for turbidity.

As to potential impacts from construction traffic, Mr. Cummings' testimony establishes that any seismic vibrations caused by heavy construction vehicles would be minimal and not at all likely to cause permanent damage to the well.³⁷⁹ Any turbidity in the well caused by seismic vibrations from construction vehicles would be temporary.

Consequently, on this record, limited parties Horst and Cavinato have not established that it is reasonable or necessary for Idaho Power to test the well water on their property before, during and after construction to ensure that construction-related activities do not adversely impact their well water quality and quantity. The requirements of Design Feature 32 (incorporated into Recommended Soil Protection Condition 4) will address their concerns about blasting activities. Other proposed mitigation measures, including reduced vehicle speeds, will address their concerns about impacts from construction traffic. Mr. Horst and Ms. Cavinato have also failed to establish a need for Idaho Power to build a new road to direct construction-related traffic away from the deep well on their property.

Issue SS-5: Whether Applicant has adequately evaluated construction-related blasting in Union County, City of La Grande, under the Structural Standard. Specifically, whether Applicant should be required to conduct site-specific geotechnical surveys to characterize risks from slope instability.

Limited party Jonathan White has standing on Issue SS-5. In his direct testimony, Mr. White asserted that because the Proposed Order does not provide specifics about where construction-related blasting may occur, the proposed facility does not comply with the

³⁷⁸ Cummings Rebuttal Test. at 13.

³⁷⁹ Cummings Rebuttal Test. at 45-46.

Structural Standard. Mr. White further argues that because the company has not yet conducted a site-specific study of the slope above his home or at proposed tower locations along the route in the hills above La Grande to characterize the potential geological and soils hazards at those locations, Idaho Power has not met the requirements of OAR 345-022-0020(1)(c). White Direct Test. at 1-2.

Contrary to Mr. White's contention, Idaho Power has already performed significant reconnaissance level work, including literature review and preliminary visits to site boundary areas, to characterize the potential geological and soils hazards within the site boundary. See, e.g., ASC Exhibit H, Attachment H-1, Engineering Geology and Seismic Hazards Supplement³⁸⁰ and ASC Exhibit I, Section 3.2.3 (Assessing Erosion Impacts).³⁸¹ Furthermore, as the Department noted in the Second Amended Project Order, a detailed site-specific geotechnical investigation for the entire site boundary is not practical in advance of completing the final facility design and obtaining full site access.³⁸² In the Proposed Order, the Department concluded that Idaho Power, in consultation with DOGAMI, adequately identified potential risks of slope stability and that the evaluation provided in Exhibit H was sufficient to inform the evaluation under the Structural Standard.³⁸³ The Department approved Idaho Power's two-phase plan and recommended that Council find that, subject to Idaho Power's compliance with the recommended Structural Standard conditions, the company Power can design, engineer, and construct the facility to avoid danger to human safety and the environment.³⁸⁴

Mr. White presented no new facts or exhibits to support his claim. In the ASC, and as supplemented by the testimony of Mr. Sorensen and Mr. Cummings, Idaho Power has provided sufficient evidence to evaluate compliance with the Structural Standard. In its Phase 2 Site-Specific Geotechnical Report, to be completed after issuance of the site certificate and prior to construction, Idaho Power will include the requisite site-specific information for sites that will be impacted by construction and operation of the project. Further, where appropriate and necessary, Idaho Power will employ appropriate slope instability mitigation techniques.

Based on its compliance with the pertinent site conditions (the Recommended Structural Standard Conditions and Recommended Soil Protection Condition 4), Idaho Power has demonstrated the ability to evaluate and avoid potential geologic and soils hazards, and blasting-related impacts, in accordance with the Structural Standard requirements.

Miscellaneous Issue - Hazardous materials management and monitoring

Issue M-6: Whether the Proposed Order fails to provide for a public review of

³⁸⁰ ODOE - B2HAPPDoc3-14 ASC 08a_Exhibit H_Geology_ASC_Part 1 2018-09-28, pages 42 to 243.

³⁸¹ ODOE - B2HAPPDoc3-16 ASC 09a_Exhibit I_Soil_ASC_Part 1 2018-09-28, pages 9-13 of 115.

³⁸² ODOE - B2HAPPDoc15 ApASC Second Amended Project Order 2018-07-26, page 14 of 29.

³⁸³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 80 to 96.

³⁸⁴ *Id.* at pages 96-98.

final monitoring plans, fails to provide long-term hazardous materials monitoring, and improperly allows exceptions that substantially increase the likelihood of a hazardous material spill in violation of OAR 345-021-0010(w).

Limited party Marlette has standing on Issue M-6. In her direct testimony and closing argument, Ms. Marlette asserted that the Council should provide the public the opportunity to review and comment on final monitoring plans, including the SPCC Plan.³⁸⁵ Ms. Marlette also claimed that the SPCC Plan is inadequate because it does not require long-term monitoring for hazardous material contamination during operation of the proposed facility and is not consistent with the setbacks included in the federal B2H Final Environmental Impact Statement (FEIS).³⁸⁶ In addition, Ms. Marlette asserted that Idaho Power will use and store hazardous materials (including herbicides) during operation of the proposed facility, and for that reason, additional monitoring and safety precautions are necessary to protect the public and resources from hazardous materials spills. Marlette Closing Brief on Issue M-6 at 2-4. For the reasons that follow, Ms. Marlette's contentions lack merit.

Review of final plans. First, and contrary to Ms. Marlette's contention, the Council is not required to provide further public review and comment on draft plans, including the SPCC Plan, before approving a site certificate. As set out in the findings above, Idaho Power included a draft SPCC Plan in ASC Exhibit G.³⁸⁷ The public had the opportunity to review and comment on the SPCC Plan (and all other draft monitoring and mitigation plans in the ASC) during the public meetings and during the comment period following the issuance of the DPO. Idaho Power had the opportunity to respond to those comments, and the Department considered the public comments and responses thereto in making its findings in the Proposed Order.

In the Proposed Order, the Department discussed the substance of the draft SPCC Plan and recommended Soil Protection Condition 2, which requires Idaho Power to submit a final SPCC Plan to the Department prior to construction of the facility.³⁸⁸ This final review process for draft plans in the ASC is authorized by ORS 469.402.³⁸⁹ The statute allows the Council, in

³⁸⁵ As set out in the findings, the SPCC Plan (Attachment G-4 to ASC Exhibit G), outlines the preventive measures and practices that contractors will employ during construction of the proposed facility to reduce the likelihood of an accidental release hazardous or regulated liquid and the measures to be taken to expedite the response should such a spill occur.

³⁸⁶ Ms. Marlette did not submit the FEIS as an exhibit in this matter. Idaho Power attached a courtesy copy of Chapter 3 of this document as Attachment A to its Closing Arguments for Issue M-6.

³⁸⁷ ODOE - B2HAPPDoc3-13 ASC 07_Exhibit G_Materials_ASC 2018-09-28, page 14 of 102.

³⁸⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 106 of 10016.

³⁸⁹ ORS 469.402 provides:

If the Energy Facility Siting Council elects to impose conditions on a site certificate or an amended site certificate, that require subsequent review and approval of a future action, *the council may delegate the future review and approval to the State Department of*

its discretion, to approve a site certificate based on draft plans and impose a condition delegating future review and approval of such plans to the Department without further public participation.

The Court of Appeals' decision in *Gould v. Deschutes County*, 216 Or App 150 (2007), referenced by Ms. Marlette, does not dictate a different result. The circumstances at issue in *Gould* are not analogous to Department and Council review of a site certificate application. *Gould* involved appellate review of a LUBA decision that upheld the county's conditional approval of a conceptual master plan (CMP) for a destination resort development near Redmond, Oregon. The *Gould* court noted that state and local law contain special standards for approving destination resort developments and that the proposed development at issue was subject to compliance with the Deschutes County Code (DCC) Chapter 18.113. The DCC requires a three-step process for approving a destination resort. The first step includes consideration and approval of the CMP at a public hearing where the developer must submit evidence of the CMP's compliance with the DCC. Under the DCC, any approval must be based on the record created at that public hearing. DCC 18.113.040(A). Then, once the CMP is approved, it becomes the standard for staff evaluation of a "final master plan," and any "substantial change" in the CMP must be reviewed and approved using the same process as the original plan approval pursuant to DCC 18.113.040(C). *Gould* at 153-54.

Petitioner Gould challenged LUBA's decision to uphold the county's approval of the CMP asserting, among other things, that the county acted contrary to DCC requirements when it approved a wildlife mitigation plan for the CMP outside of the public hearing process. The court agreed and found that, to adhere to the DCC approval process, the county should have postponed approval of the CMP to allow for a public hearing on a draft wildlife mitigation plan. In reversing and remanding the matter to LUBA, the court explained:

The county's decision is inconsistent with ORS 215.416(9)³⁹⁰ because the decision lacks a sufficient description of the wildlife impact mitigation plan, and justification of that plan based on the standards in DCC 18.113.070(D). Second, that code provision requires that the content of the mitigation plan be based on "substantial evidence in the record," not evidence outside the CMP record. In this case, the particulars of the mitigation plan were to be based on a future negotiation, and not a county hearing process. Because LUBA's opinion and order concluded that the county's justification was adequate despite those deficiencies, the board's decision was "unlawful in substance."

Energy if, in the council's discretion, the delegation is warranted under the circumstances of the case.

Emphasis added.

³⁹⁰ ORS 215.416(9), addressing county approval of land use permit applications, states:

Approval or denial of a permit or expedited land division shall be based upon and accompanied by a brief statement that explains the criteria and standards considered relevant to the decision, states the facts relied upon in rendering the decision and explains the justification for the decision based on the criteria, standards and facts set forth.

216 Or App at 159-60.

Gould does not govern this contested case because, as noted above, the resort development CMP review process established under the DCC is not analogous to the Department and Council review process for site certificate applications. In this matter, in accordance with the policy and procedures set out in ORS Chapter 469, the draft SPCC Plan and other monitoring and mitigation plans were submitted in the ASC and were subject to public review and comment in hearings following issuance of the DPO. There is nothing in the EFSC governing statutes or rules that require public review and comment prior to finalization of these plans. As noted above, ORS 469.402 authorizes the Council to delegate the approval of a future action to the Department. Furthermore, pursuant to OAR 345-025-0016, a certificate holder “must develop proposed monitoring and mitigation plans in consultation with the Department and, as appropriate, other state agencies, local governments and tribes,” but again, there is no requirement for additional public input prior to the finalization of such plans.

In short, there is no need for Idaho Power to finalize all draft mitigation and/or monitoring plans (including the SPCC Plan) prior to Council’s approval of a site certificate and there is no requirement for further public review and comment on the draft plans before issuance of a site certificate. Under ORS 469.402, Council may find that an applicant’s draft plans constitute sufficient evidence on which to base a finding of compliance with applicable standards, and may condition its approval on draft plans that are subject to future final review by the Department.

Sufficiency of the SPCC Plan. Second, a preponderance of the evidence establishes the SPCC Plan includes protective measures sufficient to demonstrate compliance with relevant Council standards. In the Proposed Order, the Department reviewed the SPCC Plan in connection with the Soil Protection standard³⁹¹ and the Retirement and Financial Assurances standard.³⁹² In its findings regarding the Soil Protection standard, the Department discussed the SPCC Plan’s spill prevention and emergency preparedness provisions and recommended site certificate conditions related to the plan. The Department agreed that a SPCC Plan would not be necessary during operation of the facility unless Idaho Power took over operation of the Longhorn Station. The Department included Recommended Soil Protection Condition 3 to address that contingency.³⁹³ The Department recommended that the Council find, subject to

³⁹¹ As discussed previously, under the Soil Protection standard, the Council must find that the construction and operation of the facility is not likely result in adverse impact to soils including “chemical factors such as * * * chemical spills.” OAR 345-022-0022.

³⁹² As discussed previously, the Retirement and Financial Assurance standard requires, among other things, that the Council find that the site “can be restored adequately to a useful, non-hazardous condition following permanent cessation of construction or operation of the facility.” OAR 345-022-0050(1).

³⁹³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 106 of 10016 (“The applicant does not anticipate that it would be required to adhere to an SPCC Plan during operations unless it were to operate the Longhorn Station instead of BPA.”) The recommended condition provides that if, prior to construction, Idaho Power is required by DEQ statutes or rules to implement a SPCC Plan for operation of the facility, then the Company must submit to the Department a copy of a DEQ-approved

Idaho Power's compliance with the recommended site certificate conditions, the construction and operation of the proposed facility comply with the Soil Protection standard. Ms. Marlette did not present any persuasive evidence to the contrary.

With regard to the Retirement and Financial Assurances standard, the Department reviewed the information submitted in ASC Exhibit W,³⁹⁴ and determined that Idaho Power was not required to develop a hazardous materials monitoring plan because, after completing construction, there will be no hazardous materials used or stored on site.³⁹⁵ Ms. Marlette did not present any persuasive evidence to the contrary.

Third, the FEIS setbacks identified by Ms. Marlette are not relevant to the SPCC Plan, and are not necessary to ensure that SPCC Plan complies with Council standards. The SPCC Plan requires that transfer of liquids or refueling must occur at least 100 feet from any wetlands or surface waters. Ms. Marlette argues that Idaho Power should apply a 300-foot setback for such activities, based on FEIS Design Feature 15.³⁹⁶ However, the 300-foot setback discussed in FEIS Design Feature 15 applies only to surface-disturbing activities. The transfer of liquids and refueling is not a surface-disturbing activity. Design Feature 21 (Disposal of Hazardous Materials and Construction Waste) is the only provision FEIS pertinent to the SPCC Plan, and the SPCC Plan's 100-foot setbacks for on-site activities are more specific and conservative than those stated in FEIS Design Feature 21.³⁹⁷

operation-related SPCC Plan and maintain compliance with the plan during operations at Longhorn Station. *Id.*

³⁹⁴ Pursuant to OAR 345-021-0010(1)(w)(E), for proposed facilities that might produce site contamination by hazardous materials, the ASC must include a proposed monitoring plan or an explanation why a monitoring plan is unnecessary.

³⁹⁵ During the operations phase, all use and storage of gasoline and diesel will remain inside vehicles that will come and go from the site. Herbicides are not hazardous materials and will be managed by licensed contractors. *See* Stippel Rebuttal Test., Issue M-6, at 9.

³⁹⁶ Design Feature 15 of the FEIS (Reduce Impacts on Riparian Areas) states, in pertinent part:

Consistent with the BLM and USFS PACFISH/INFISH riparian management policies, surface-disturbing activities would be avoided in defined segments of RCAs, using the following delineation criteria, unless exception criteria defined by the BLM are met or with agency approval of acceptable measures to protect riparian resources and habitats by avoiding or minimizing stormwater runoff, sedimentation, and disturbance of riparian vegetation, habitats, and wildlife species:

- Fish-bearing streams: 300 feet slope distance on either side of the stream, or to the extent of additional delineation criteria—whichever is greatest.
- Perennial non-fish-bearing streams: 150 feet slope distance on either side of the stream, or to the extent of additional delineation criteria—whichever is greatest.

Idaho Power Closing Arguments for Issue M-6, Attachment A at 3-4.

³⁹⁷ Design Feature 21 of the FEIS states:

In summary, Ms. Marlette has failed to present evidence to substantiate her claims with regard to Issue M-6. There is no Council standard requiring public review and comment of final monitoring plans. The evidence in the record persuasively establishes that there is no need for Idaho Power to have a long-term monitoring plan in place for purposes of the Soil Protection Standard or the RFA Standard. The SPCC Plan and recommended Soil Protection Condition 2 adequately address the management of hazardous substances to be used and stored during construction of the proposed facility. Because Idaho Power does not anticipate using and storing hazardous materials during facility operation and the facility is not one that will produce contamination by hazardous materials, there is no need for a long-term monitoring plan.

Ms. Marlette proposed two conditions in her Closing Arguments (Closing Brief of JoAnn Marlette, Pro Se Petitioner Issue M-6: Monitoring Plans for Hazardous Materials at 3), as presented below:

1. **Marlette Proposed Condition 1 for Issue M-6:** Idaho Power will complete a site-specific, written exception any time they are unable to follow the standard procedures for managing hazardous chemicals. The exception will include identification of additional safety precautions they will use to minimize the risk of spills.”
2. **Marlette Proposed Condition 2 for Issue M-6:** In order to approve an exception, the EI must complete a site-specific SPCC plan that identifies additional measures that will be implemented to assure no spills occur, which would include the need for more safeguards when using chemicals in hazardous areas. The plan must be maintained and remain at the site to comply with OAR 345-022-0050.”

The Council rejects Marlette’s proposed conditions for the following reasons. The Department’s recommended Soil Protection Condition 2, as included in the Proposed Order on the ASC, would require that Idaho Power and their Contractor(s) adhere to the requirement of an SPCC. Ms. Marlette’s proposed conditions presume that Idaho Power would not be able to comply with standard procedures and would require exceptions under the SPCC. If Idaho Power cannot comply with the requirements of the SPCC, including standard procedures for managing hazardous chemicals, they would be obligated to submit a report to the Department under OAR Division 29 (OAR 345-029-0010) documenting their site certificate non-compliance and explaining the impact and resolution, for Department determination on whether to exercise enforcement. If Idaho Power requires an exception to the SPCC, there are only specific components of the plan that allow exceptions, such as an exception to the minimum setback from disturbance to water bodies if the topography is not suitable (i.e. substantial slope) for achieving such setback. Otherwise, general exceptions to the SPCC requirements are not allowable and Idaho Power must comply with all requirements of the SPCC under Soil Protection Condition 4. For these reasons, Ms. Marlette’s proposed conditions are unnecessary and inappropriate.

Proposed Site Certificate Conditions Unrelated to Identified Issues on Which the Limited Parties Have Standing in the Contested Case

In addition to the proposed conditions discussed previously in this order, two limited

parties, Ms. Gilbert and Ms. Geer, timely proposed site certificate conditions pertaining to matters unrelated to the identified issues on which they have standing in the contested case. Idaho Power objected to these proposed conditions and requested that the ALJ exclude them from further consideration in the contested case because they are not within the scope of the issues properly raised by the limited parties in this matter.³⁹⁸ Idaho Power asserted that the ALJ and Council should read OAR 345-015-0085(1)³⁹⁹ narrowly and in conjunction with OAR 345-015-0016,⁴⁰⁰ to preclude a limited party from proposing site conditions that are outside the scope

Hazardous material would not be discharged onto the ground or into streams or drainage areas. Enclosed containment would be provided for all waste. All construction waste (i.e., trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials) would be removed to a disposal facility authorized to accept such materials within one month of B2H Project completion, except for hazardous waste which would be removed within one week of B2H Project completion.

Refueling and storing potentially hazardous materials would not occur within a 200-foot radius of all identified private water wells, and a 400-foot radius of all identified municipal or community water wells. Spill prevention and containment measures would be incorporated as needed.

Idaho Power Closing Arguments for Issue M-6, Attachment A at 5.

³⁹⁸ See Idaho Power Company's Response to Limited Parties' Proposed Site Certificate Conditions, filed November 18, 2021, at 36-39.

³⁹⁹ OAR 345-015-0085(1) states, in pertinent part: "The hearing officer shall allow *any party, including any limited party, to propose site certificate conditions* that the party believes are necessary or appropriate to implement the policy of ORS 469.310 or to meet the requirements of any other applicable statute, administrative rule or local government ordinance."

⁴⁰⁰ OAR 345-015-0016(3) states, in pertinent part: "If a person has not raised an issue at the public hearing with sufficient specificity to afford the decision maker an opportunity to respond to the issue, the hearing officer may not consider the issue in the contested case proceeding."

of the contested case issues and/or outside the scope of the matters on which the limited party has standing.

Idaho Power argued, in pertinent part, as follows:

[I]nterpreting OAR 345-015-0085(1) to allow all parties to propose conditions on all issues—without any limitation as to whether the limited party properly raised the issue in this case—would frustrate the intent to limit issues raised in the contested case to those raised with sufficient specificity in DPO comments. Additionally, it would achieve an absurd result, in which a limited party could sandbag the contested case by proposing *entirely new conditions on entirely new issues* without having raised them below, thus entirely undermining the Council's framework for conducting contested cases.

Idaho Power Company's Response to Limited Parties' Proposed Site Certificate Conditions at 38, emphasis in original,

In light of Idaho Power's request to exclude these proposed conditions from consideration, the ALJ certified the following two questions to Council for its consideration and disposition.⁴⁰¹

1. Should OAR 345-015-0085(1) be read to restrict a limited party's authorization to propose site certificate conditions to those that relate to and are within the scope of the issue(s) on which the limited party was granted standing in the contested case?
2. Should OAR 345-015-0085(2) be read to restrict a limited party to presenting evidence and argument relating to the appropriateness, scope or wording of another party's proposed site certificate condition to those proposed conditions that relate to and are within the scope of the issue(s) on which the limited party was granted standing in the contested case?

Certified Questions to Council Regarding Interpretation of OAR 345-015-0085(1) and (2), issued December 14, 2021. The Council declined to provide answers to these two questions,⁴⁰² thereby leaving it up to the ALJ to determine the Council's intention.

The ALJ appreciates Idaho Power's arguments on this issue. The ALJ also agrees that

⁴⁰¹ OAR 345-015-0023(5)(k) authorizes the ALJ, in her discretion, to "certify any question to the Council for its consideration and disposition."

⁴⁰² See Ratcliffe email to ALJ Webster, December 23, 2021 ("The Council received legal advice on the questions and deliberated extensively on the legal and policy issues involved. The Council took several motions on both sides of the questions, but none of the motions received a majority. As a result, the Council cannot provide answers to your questions at this time.")

allowing a limited party to propose *any* site certificate conditions that the limited party believes are necessary or appropriate notwithstanding the limitations on that limited party's standing and participation in the contested case tends to frustrate the intent of ORS 469.370 and OAR 345-015-0016. Both the statute and rule specify that the contested case shall be limited to those issues properly raised on the record of the DPO.⁴⁰³

On the other hand, the broad language of OAR 345-015-0085(1) ("the hearing officer shall allow any party, including any limited party, to propose site certificate conditions"), cannot be ignored. *See, e.g., Papas v. OLCC*, 213 Or App 369 (2007) (an agency interpretation of a rule that is inconsistent with the wording of the rule and its context is not plausible and is not entitled to deference). If the Council intended to limit a party/limited party's ability to propose site certificate conditions to those within the scope of the issues on which the party/limited party has standing in the contested case, then it could and would have so stated in the rule.

Based on the plain language of OAR 345-015-0085(1) and the Council's unwillingness to answer the certified questions in the affirmative, the ALJ declines Idaho Power's request to exclude these proposed site certificate conditions from further consideration based on the limited party's lack of standing. In other words, the ALJ relies on the broad language of the rule and declines to insert limitations on standing that the Council and Department did not specifically include in the rule. Accordingly, what follows is a determination whether the additional proposed conditions submitted by Ms. Gilbert⁴⁰⁴ and Ms. Geer⁴⁰⁵ are necessary or appropriate to implement the policy of ORS 469.310 or meet the requirements of any other applicable law.

Gilbert Additional Proposed Site Certificate Conditions

1. Gilbert Proposed Financial Assurance Condition: Prior to the start of construction, the developer will document that they have the financial ability to pay for construction costs they will be assuming that exceed the 21% amount reflected in the application and provide documentation regarding any other party

⁴⁰³ Both ORS 469.370 and OAR 345-015-0016 state that issues that may be the basis for the contested case shall be limited to those raised with sufficient specificity on the record of the public hearing. *See also* OAR 345-015-0083(2), which requires the ALJ to issue a prehearing order stating the issues to be addressed in the contested case and "limiting parties to those issues they raised on the public hearing." The rule also prohibits the ALJ from "receiv[ing] evidence or hear[ing] legal argument on issues not identified in the prehearing order."

⁴⁰⁴ Ms. Gilbert submitted 20 total proposed site certificate conditions. She proposed 17 new conditions in a document named "Site Certificate Conditions and statutes to use" (Gilbert Proposed Conditions). She also submitted the following proposed conditions: a "Request Regarding B2H Site Certificate Condition Related to the Need for the Traffic Plan to Be Completed and Approved by Counsel Prior to Start of Construction;" a "Request Regarding B2H Site Certificate Impacts to Quiet Areas;" and a "Request Regarding B2H Site Certificate Condition Related to Statutory Requirement that Citizens Impacted by a State Action Receive Notice as Specified in ORS 183.415."

⁴⁰⁵ Ms. Geer submitted two conditions outside the scope of her Fish and Wildlife Habitat/Noxious Weed Plan issues: one related to Sandhill Cranes and one related to Trifolium Douglasii.

which will be assuming the costs not being covered by Idaho Power.

Ms. Gilbert submitted this proposed condition asserting that it is required by ORS 469.501(1)(d).⁴⁰⁶ Ms. Gilbert did not submit any evidence in support of this proposed condition or any further explanation as to why she believes it is necessary or appropriate to meet the requirements of OAR 345-022-0050 (the RFA Standard).

Both the Department and Idaho Power oppose this proposed condition and recommend that it be rejected. Idaho Power also notes that the Proposed Order recommends that Idaho Power be required to carry a bond or letter of credit during construction equal to the amount required to decommission the line and restore the site to a useful condition.

Because there has been no showing that this proposed RFA condition is necessary or appropriate, the proposed condition is denied.

2. Gilbert Proposed Water Quality Condition: Prior to starting construction the developer will provide results of testing of all wells or springs within 2,000 feet of the transmission line corridor to document pre-construction condition. The testing will be repeated within the first and second years of operation to determine if there has been a reduction in quantity or quality of water available.

Ms. Gilbert submitted this proposed condition without specifying the applicable statute or Council standard, without supporting evidence, and without explaining why she believes this condition is necessary or appropriate to implement the policy of ORS 469.310 or satisfy an applicable statute, standard, or rule.

Both the Department and Idaho Power assert this proposed condition is unsupported and unnecessary, and recommend that it be rejected. Idaho Power also notes that to the extent this proposed condition relates to the Structural Standard and to limited parties' concerns that construction-related blasting could impact well water quality, the Company has agreed to incorporate a modified version of Design Feature 32 from the Framework Blasting Plan into Recommended Soil Protection Standard Condition 4. Consequently, if Idaho Power plans to conduct blasting on a landowner's property, the condition requires that Idaho Power, at the landowner's request, conduct pre-blasting baseline flow and water quality measurements for turbidity.

Ms. Gilbert has not established that this proposed condition for pre-construction water quality testing is necessary or appropriate. Idaho Power has explained why the proposed condition is not necessary. Accordingly, this proposed condition is denied.

3. Gilbert Proposed Condition Regarding Fish Passage: Starting with year 6 and for the remainder of the life of the development all fish passage sites will be

⁴⁰⁶ ORS 469.501(1)(d) states: "(1) The Energy Facility Siting Council shall adopt standards for the siting, construction, operation and retirement of facilities. The standards may address but need not be limited to the following subjects: * * * (d) The financial ability and qualifications of the applicant."

monitored and maintained every other year to assure fish continue to be able to pass through the locations requiring fish passage. Results of the monitoring will be provided to the department.

Ms. Gilbert argues that this Fish and Wildlife Habitat/Fish Passage site certificate condition is necessary because Idaho Power must maintain mitigation for the life of the development and continue monitoring to assure compliance with the site certificate conditions.

Both the Department and Idaho Power oppose this proposed condition and assert it is unnecessary. In its opposition to this proposed condition, Idaho Power explains that, it submitted fish passage plans and designs for seven temporary road crossing structures that require review by ODFW.⁴⁰⁷ Idaho Power will permanently remove these structures once construction activities are completed.⁴⁰⁸ ODFW approved the proposed fish passage designs, contingent on Idaho Power maintaining, monitoring, evaluating, and reporting on these fish passages as required by ORS 509.610.⁴⁰⁹ ODFW's approval requires Idaho Power to provide written reports annually for the first three years after project completion, and then a final report at year five, or as determined by ODFW.⁴¹⁰ ODFW is the agency with the expertise to determine the appropriate monitoring and reporting period and, at this point, ODFW has approved the proposed fish passage plans with a final report in year five (or as otherwise determined by ODFW). For this reason, Ms. Gilbert's proposed condition is neither necessary nor appropriate. As Idaho Power notes, if ODFW determines based on the year five final report that impacts from the temporary structures have not been rectified, then ODFW may require additional actions from Idaho Power.

Ms. Gilbert has not established that this proposed condition to maintain and monitor fish passage sites for the life of the project is necessary or appropriate. Idaho Power has explained why the proposed condition is unnecessary and excessive. Therefore, this proposed condition is denied.

4. Gilbert Proposed Forest Practices Act Condition: Prior to the start of construction, the developer must survey all streams where timber will be removed within 300 feet of the stream during construction of the transmission line. If fish are present and impacts will occur within 100 feet of the transmission line or Threatened and Endangered species are present, [a] written plan of action must be developed for the approval of the Oregon Department of Forestry and the Council.

⁴⁰⁷ As found above, in the Proposed Order, the Department recommended that Council find Idaho Power's proposed fish passage compliance plan "is sufficient to demonstrate compliance with the ODFW Fish Passage rule, that the plan should be finalized prior to construction based on final facility design, and that the plan should be implemented during construction." ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 351 of 10016

⁴⁰⁸ ODOE - B2HAPPDoc3-45 ASC 28_Exhibit BB_Other_Info_ASC 2018-09-28, pages 75-98 of 209.

⁴⁰⁹ ODOE - B2HAPPDoc3-45 ASC 28_Exhibit BB_Other_Info_ASC 2018-09-28, page 98 of 209.

⁴¹⁰ *Id.*

Ms. Gilbert argues that this condition is necessary because ORS 527.670⁴¹¹ requires a written plan of operation prior to any forestry operation, including clearing of an area to build a transmission line within 100 feet of a stream used by fish or within 300 feet of a stream containing state or federally threatened or endangered species. Gilbert Proposed Conditions at 3-4.

Both the Department and Idaho Power oppose this proposed condition as inappropriate and unnecessary. In the Proposed Order, the Department addressed the proposed facility's compliance with the Oregon Forest Practices Act (FPA) as follows:

In ASC Exhibit BB, the applicant requests Council review of compliance with the requirements of the Oregon Forest Practices Act (FPA) as implemented under ORS 527.610 to 527.770, 527.990(1) and 527.992, and the implementing rules at OAR Chapter 629. More specifically, the applicant requests Council grant an exemption from FPA's reforestation requirements and approve a Plan for an Alternative Practice, as in forest lands for uses not meeting reforestation requirements.

The requirements of the FPA include providing notification to the State Forester prior to commencement of operation; submitting a request for a permit to operate power driven machinery; submittal of a written plan; and obtaining approval of a Plan for Alternative Practice, if a use would not meet reforestation requirements. While compliance with these requirements supports minimization of impacts to forest lands, as evaluated in IV.E. Land Use and IV.M. *Public Services* of this order, the Department recommends Council not assert jurisdiction of the FPA and refer the applicant to submit its request for exemption directly to the Oregon Department of Forestry, consistent with the approach described in ASC Exhibits K and BB where the applicant represents it would work directly with the state agency on FPA requirements.

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 622-23 of 10016. The Department also noted that Idaho Power's compliance with FPA requirements would reduce potential impacts evaluated under the Council's Land Use and Protected Area standards. *Id.* at n. 645.

Based on the above recommendations in the Proposed Order (*i.e.*, that Idaho Power work directly with the Oregon Department of Forestry), Idaho Power contends that Ms. Gilbert's proposed condition is redundant and unnecessary. The ALJ agrees, and rejects this proposed condition.

5. Gilbert Proposed Condition Regarding Wetlands: Prior to the start of construction, the developer must complete a compatibility analysis regarding the impacts of the proposed development on surrounding wetlands.

⁴¹¹ ORS 527.670, part of the Oregon Forest Practices Act, requires the State Board of Forestry to, among other things, designate the types of operations for which notice shall be required and identify the types of operations that require a written plan.

Referencing *Foland v. Jackson County*, LUBA 2009109, 2009112, 2009113, *affirmed* 239 Or App 60 (2010), Ms. Gilbert asserts that a “compatibility analysis [is] needed for proposed development with the surrounding wetlands.” Gilbert Proposed Conditions at 4. Ms. Gilbert offered no further explanation or argument as to the *Foland* decision is relevant,⁴¹² why she believes this a compatibility analysis of surrounding wetlands is necessary, or even what constitutes surrounding wetlands.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power notes that, in the ASC, it addressed project related impacts to waters of the state, including wetlands. It included its Joint Permit Application to the Department of State Lands (DSL) and the U.S. Army Corps of Engineers, which addressed construction activities occurring in waters of the state. Idaho Power also recommended, and the Proposed Order includes, Recommended Removal-Fill conditions.⁴¹³ The Recommended Removal-Fill Conditions require, among other things, that prior to construction of a phase or segment of the facility, Idaho Power: submit updated wetland delineation reports to the Department and DSL; receive a Letter of Concurrence from DSL; and submit a final Site Rehabilitation Plan addressing mitigation and restoration of impacted waters of the state, including wetlands.⁴¹⁴ Recommended Removal-Fill Condition 2 also requires that following construction and during operation, Idaho Power ensure that temporary impacts to wetlands and non-wetland waters of the state are restored in accordance with the final Site Rehabilitation Plan.⁴¹⁵

Because Ms. Gilbert’s proposed condition regarding surrounding wetlands is vague, unsupported, and unnecessary in light of the Recommended Removal-Fill Conditions, it is denied.

6. Gilbert Proposed Conditions Relating to Historic Properties: (a) Prior to construction, the developer must complete a cumulative effects assessment of the impacts the development will have on historic properties referenced in 36 CFR 800.5 and provide appropriate mitigation for the impacts.

(b) Idaho Power must identify and provide mitigation for both direct and indirect impacts of the proposed transmission line to Historical Properties located within 5 miles or to the visual horizon of the transmission line as required by the

⁴¹² *Foland* involved review of a LUBA decision remanding Jackson County’s decision to approve a Department of Transportation application to site an interstate highway rest area and welcome center on land south of Ashland zone for exclusive farm use. The Court of Appeals upheld the LUBA’s determination that, “Goal 11 prohibits the extension of city water services to serve that urban use on rural land without an exception to Goal 11.” 239 Or App at 72.

⁴¹³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 668 to 677 of 10016.

⁴¹⁴ *Id.* at 671-673.

⁴¹⁵ *Id.* at 673.

Boardman to Hemingway Programmatic Agreement required to meet the requirements of Section 106 of NEPA.

Ms. Gilbert argues that these proposed conditions are appropriate because they are required under the B2H Programmatic Agreement. As for proposed condition (a) above, Ms. Gilbert asserts that the Programmatic Agreement “requires on Page 6 that the assessment of impacts include direct and/or indirect, or reasonably foreseeable effects caused by the undertaking that may occur overtime, be farther removed in distance or be cumulative.” Gilbert Proposed Conditions at 4. As for proposed condition (b) above, Ms. Gilbert asserts that Idaho Power “only evaluated direct impacts to National Register of Historical Properties eligible sites” contrary to the provisions of the Programmatic Agreement. *Id.* at 5.

Both the Department and Idaho Power opposed these proposed conditions as unsupported and unnecessary. As for proposed condition (a) above, Idaho Power notes that it has already conducted a cumulative effects analysis and has proposed site-specific avoidance and mitigation plans in the HPMP.⁴¹⁶ Idaho Power also asserts that it is inappropriate to require that the analysis be conducted pursuant to 36 CFR 800.5, because Council’s role is limited to ensuring compliance with all applicable state and local laws, not federal law.

As for proposed condition (b), both the Department and Idaho Power note that the Proposed Order already requires Idaho Power to identify and provide proposed mitigation measures for both direct (permanent/ground disturbing) and indirect (visual) impacts.⁴¹⁷ Idaho Power adds that, by definition, direct impacts occur only within the site boundary, so a condition requiring the Company to identify and propose mitigation for direct impacts within five miles would be illogical. Idaho Power also notes that Council does not enforce compliance with federal laws (such as Section 106 of NEPA), and that Recommended Historic, Cultural and Archeological Resources Condition 2 requires Idaho Power to submit a final EFSC HPMP to the Department, the State Historic Preservation Office, and applicable Tribal Governments for review and Department approval.⁴¹⁸

Ms. Gilbert has not established that these proposed conditions relating to compliance with the Programmatic Agreement are necessary or appropriate. The Department and Idaho Power have shown that these proposals are unnecessary and either redundant or outside the Council’s jurisdiction. Therefore, these proposed conditions are denied.

7. Gilbert Proposed Condition Regarding Construction Helicopters:

Construction helicopters shall not impede emergency transports by flying above the helipad located on the roof of the Grande Ronde Hospital or flying across routes used by Life Flight Emergency transport leaving or returning to the helipad.

⁴¹⁶ See Ranzetta Rebuttal Testimony, Issues HCA-3, HCA-4, and HCA-7, pages 51-52.

⁴¹⁷ See e.g., ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 460 of 10016.

⁴¹⁸ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 513 of 10016.

Ms. Gilbert asserts that this condition is required under the Public Services Standard, OAR 345-022-0110, because construction and operation of the proposed facility could potentially interfere with the provision of emergency medical transport and treatment to citizens. Gilbert Proposed Conditions at 6.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power notes that, in the Proposed Order, Recommended Public Services Condition 3 requires the Company to submit a Helicopter Use Plan to the Department and each affected county planning department prior to the use of a helicopter during construction.⁴¹⁹ Recommended Public Services Condition 4 requires the Company to submit appropriate notices to the Federal Aviation Administration (FAA) and the Oregon Department of Aviation to determine if any facility structures or power lines within five miles of an airport will pose a hazard to aviation safety.⁴²⁰ Idaho Power asserts that helicopter operators must adhere to FAA regulations for low-flying aircraft, the FAA works with local air traffic control to communicate and track all planes and helicopters in their vicinity, and local air traffic control communicates with helicopter companies regarding routes to fly to avoid existing commercial airline patterns.

In the Proposed Order, the Department recommended that the Council find that construction and operation of the proposed facility is not likely to result in significant adverse impacts to the ability of the public and private air safety providers within the analysis area.⁴²¹ Ms. Gilbert has not established otherwise. Accordingly, Ms. Gilbert's proposed condition regarding construction helicopters is denied.

8. Gilbert Proposed Condition Regarding Visual Analysis for Historic Places: The developer must complete a visual analysis and provide mitigation for visual impacts to the following locations within the City of La Grande and surrounding areas which are listed on the National Register of Historic Places in Union County, Oregon: Eastern Oregon University campus Administration Building; John Anthony House; Anthony-Buckley House; Folley Building; Hot Lake Resort; La Grande Commercial Historic District; La Grande Neighborhood Club; Liberty Theatre; Roesch Building; Slater Building; August J. Stange House; US Post Office and Federal Building; and A. B. Hudelson and Son Building in North Powder.

Ms. Gilbert contends, without further explanation or evidence, that under the HCA standard the above-listed places "require evaluation and mitigation for adverse impacts to their visual qualities." Gilbert Proposed Conditions at 7.

⁴¹⁹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 573-74 of 10016.

⁴²⁰ *Id.* at 574.

⁴²¹ *Id.*

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. In opposing this proposed condition, Idaho Power explained it addressed all of the buildings listed in the proposed condition in its Reconnaissance Level Survey (RLS) Visual Assessment of Historic Property Report, submitted as ASC Exhibit S, attachment S-7.⁴²² The RLS field study determined that these resources did not require additional evaluation for adverse impacts because of intervening vegetation and dense urban development, because the resources' historical significance was not based upon the respective views of the Blue Mountains, and/or because of the presence of an interstate highway between the resource and the proposed facility.

In the Proposed Order, subject to compliance with the recommended HCA conditions of approval, the Department recommended the Council find that, taking into account mitigation, the construction and operation of the proposed facility is not likely to result in significant adverse impacts to any historic, cultural, or archeological resources.⁴²³ Ms. Gilbert has not established otherwise. Accordingly, Ms. Gilbert's historic places proposed condition is denied.

9. Gilbert Proposed Condition Regarding Impacts to Wildlife: The developer must complete an assessment and provide mitigation for direct and indirect impacts to wildlife using habitat contained in three federal mitigation sites compensating for wildlife damages due to the Columbia River Dams and the Oregon Department of Transportation mitigation site located in the vicinity of the Ladd Marsh Wildlife Area.

Ms. Gilbert argues, without further explanation or evidence, that the mitigation sites referenced above are "afforded enhanced protection due to the role of compensating for damages" and that the proposed facility "is not to cause direct or indirect damages to these mitigation sites." Gilbert Proposed Conditions at 7.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power notes that, as part of the ASC, it completed an assessment of the direct and indirect impacts to wildlife habitat for the project generally and in the vicinity of the Ladd Marsh Wildlife Area. In the Proposed Order, the Department addressed the Ladd Marsh Wildlife Area/State Natural Heritage Area, and recommended a Protected Areas Condition requiring Idaho Power to follow mitigation plans and best practices for Category 2 habitat and to coordinate construction activities in the Ladd Marsh Wildlife Area with the Wildlife Area Manager.⁴²⁴

Ms. Gilbert has not established that this proposed condition requiring additional wildlife habitat assessments is necessary or appropriate. Idaho Power has explained why the proposed

⁴²² ODOE - B2HAPPDoc3-36 ASC 19_Exhibit S_Cultural_ASC_Public 2018-09-28, page 419 of 783. This attachment was submitted as confidential to protect the location of archeological sites and objects. See also Proposed Order at page 431, n. 469; ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 438 of 10016.

⁴²³ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 515 of 10016.

⁴²⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 271 of 10016.

condition is unnecessary. Therefore, this proposed condition is denied.

10. Gilbert Proposed Condition Regarding Slickspot Peppergrass: The developer is to identify habitat that can or does support slickspot peppergrass and avoid all construction related impacts to this habitat.

Ms. Gilbert proposed this condition asserting that, in 2016, the US Fish and Wildlife Service reinstated slickspot peppergrass as a threatened species and indicated an intent to designate critical habitat. Ms. Gilbert argued that the proposed condition is necessary to avoid conflicts between Department actions and federal rules. Ms. Gilbert did not submit any evidence related to this proposed condition.

Both the Department and Idaho Power oppose this proposed condition. First, as Idaho Power notes, slickspot peppergrass is not an Oregon-listed threatened or endangered species and is not known to occur in Oregon. Second, as set out in the *Ruling and Order on Motion for Summary Determination on Contested Case Issue FW-4*, Idaho Power has no obligation under the Fish and Wildlife Habitat Standard (or the Threatened and Endangered Species Standard) to evaluate impacts to federally-listed threatened or endangered species and/or their habitats.

Because slickspot peppergrass habitat is outside the Council's jurisdiction and authority, and because the proposed condition is neither appropriate nor necessary, it is denied.

11. Gilbert Proposed Condition Regarding Road Design: Prior to the start of construction, the developer will provide to Council the final road design standards including providing for adequate access for fire fighting equipment and will include maximum grade, road width, turning radius, road surface, bridge design, culverts and road access for their approval, and amend the site certificate to incorporate the planning document.

Ms. Gilbert contends, without further explanation or evidence, that this proposed condition is required by OAR 660-006-0040.⁴²⁵ Gilbert Proposed Conditions at 8.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power notes that at least 90 days prior to construction of a facility phase or segment it is required by Recommended Public Services Condition 2 to, among other things, prepare final Transportation and Traffic Plans that address the specific road improvements

⁴²⁵ OAR 660-006-0040, a Land Conservation and Development Department rule, addresses fire safety design standards for road. It provides as follows:

The governing body shall establish road design standards, except for private roads and bridges accessing only commercial forest uses, which ensure that public roads, bridges, private roads and driveways are constructed so as to provide adequate access for firefighting equipment. Such standards shall address maximum grade, road width, turning radius, road surface, bridge design, culverts, and road access taking into consideration seasonal weather conditions. The governing body shall consult with the appropriate Rural Fire Protection District and Forest Protection District in establishing these standards.

needed for transportation routes. These plans must be submitted to, and approved by, the appropriate federal, state, and local agencies before construction begins. The Proposed Order further requires that if Idaho Power must substantially modify a road that is not currently within the site boundary, then “it must submit an Amendment Determination Request or a Request for Amendment of the Site Certificate [and] receive Council approval via an amendment, if necessary, as provided Recommended Public Services Condition 2.”⁴²⁶

Ms. Gilbert has not established that this proposed condition regarding road design standards is required by OAR 660-006-0040, or that it is necessary or appropriate. Idaho Power has explained why the proposed condition unnecessary. Therefore, this proposed condition is denied.

12. Gilbert Proposed Condition Regarding Completion of Traffic Safety

Plans: The developer must complete the Traffic Safety Plans and the Energy Facility Siting Council must approve the plans for all areas outside the site boundary where facility related traffic will be using public roads. In addition, the approved plans are required to be included in the Site Certificate when it is issued.

In a separate filing, Ms. Gilbert states her concern that the Proposed Order does not require Idaho Power to complete, and the Council to approve, the Traffic Safety Plans prior to issuance of the site certificate, and does not include a provision for Council review of the final Traffic Safety Plans after the site certificate is issued. Gilbert Request Regarding B2H Site Certificate Condition Related to the Need for the Traffic Plan to Be Completed and Approved by Counsel Prior to Start of Construction at 1.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power also notes that the Council does not have jurisdiction or authority to evaluate roads that are not included in, and governed by, the ASC. *See* Proposed Order at page 51, n. 58.⁴²⁷ Furthermore, as discussed previously, Recommended Public Services Condition 2 already provides a thorough and appropriate review process for the final Transportation and Traffic Plans prior to construction.

Because the Council does not have jurisdiction over roads outside the site boundary and because the proposed condition is not appropriate or necessary, it is denied.

⁴²⁶ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 569 of 10016.

⁴²⁷ The Proposed Order states:

The Council does not have jurisdiction over matters that are not included in and governed by the site certificate or amended site certificate. However, the Council may rely on the determinations of compliance and the conditions in the permits issued by these state agencies and local governments in deciding whether the facility meets other standards and requirements under its jurisdiction.

ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 58 (emphasis added).

13. Gilbert Proposed Condition Regarding Noise Sensitive Locations: Once [the] transmission line is energized, ORS 469.507 requires testing or sampling to show ongoing compliance with the Noise standard for noise sensitive locations along the transmission line.

Ms. Gilbert asserts, without additional explanation or supporting evidence that the procedure outlined in the Proposed Order when a noise exceedance is reported fails to comply with state statute. Gilbert Proposed Conditions at 8. She further argues that the Department must require Idaho Power to purchase a noise easement or reduce the noise level through mitigation or other means. *Id.*

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. Idaho Power argues that ORS 469.507⁴²⁸ does not specify the type of monitoring required to comply with Council standards, and does not require the testing and sampling described in Ms. Gilbert's proposed condition. Idaho Power further asserts that because the proposed facility will comply with the Noise Rules, either directly or through an exception or variance, it did not propose any monitoring.⁴²⁹ Rather, during operations, as required by Amended Recommended Noise Control Condition 2, Idaho Power will implement a complaint response plan to address noise complaints.⁴³⁰

⁴²⁸ ORS 469.507 states as follows:

(1) The site certificate holder shall establish programs for monitoring the environmental and ecological effects of the construction and operation of facilities subject to site certificates to assure continued compliance with the terms and conditions of the certificate. The programs shall be subject to review and approval by the Energy Facility Siting Council.

(2) The site certificate holder shall perform the testing and sampling necessary for the monitoring program or require the operator of the plant to perform the necessary testing or sampling pursuant to guidelines established by the Energy Facility Siting Council or its designee. The council and the Director of the State Department of Energy shall have access to operating logs, records and reprints of the certificate holder, including those required by federal agencies.

(3) The monitoring program may be conducted in cooperation with any federally operated program if the information available from the federal program is acceptable to the council, but no federal program shall be substituted totally for monitoring supervised by the council or its designee.

(4) The monitoring program shall include monitoring of the transportation process for all radioactive material removed from any nuclear fueled thermal power plant or nuclear installation.

⁴²⁹ See ODOE - B2HAPPDoc3-41 ASC 24_ Exhibit X_Noise_ASC 2018-09-28, page 60 of 371.

⁴³⁰ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 655-55 of 10016.

Ms. Gilbert has not established that this proposed condition requiring ongoing monitoring at noise sensitive locations is necessary or appropriate. Idaho Power has explained why the proposed condition is unnecessary. Accordingly, this proposed condition is denied.

14. Gilbert Proposed Condition Regarding Construction: Prior to starting construction on any segment of the B2H transmission line, Idaho Power must provide convincing documentation that the portion would be constructed even if the remainder of the development were not built per OAR.345-025-0006(5). If the certificate holder does not have construction rights on all parts of the site, the certificate holder may [n]evertheless begin construction as defined in OAR 345-001-0010, or create a clearing on a part of the site if the certificate holder has construction rights on that part of the site and:

(a) The certificate holder would construct and operate part of the facility on that part of the site even if a change in the planned route of a transmission line or pipeline occurs during the certificate holder's negotiations to acquire construction rights on another part of the site.

Ms. Gilbert proposed this condition without further explanation or supporting evidence. Gilbert Proposed Conditions at 9.

Both the Department and Idaho Power oppose this proposed condition as unsupported and unnecessary. The Proposed Order already incorporates the mandatory site certificate conditions of OAR 345-025-0006(5) in Recommended General Standard of Review Condition 7. The Department modified this recommended condition to maintain the portions applicable to proposed transmission line facilities:

The certificate holder may begin construction, as defined in OAR 345-001-0010, or create a clearing on a part of the site if the certificate holder has construction rights on that part of the site and the certificate holder would construct and operate part of the facility on that part of the site even if a change in the planned route of transmission line occurs during the certificate holder's negotiations to acquire construction rights on another part of the site. [Mandatory Condition OAR 345-025-0006(5)]⁴³¹

As Idaho Power notes, the only meaningful difference between the Department-recommended condition and Ms. Gilbert's proposed condition is that Ms. Gilbert inserts a requirement for Idaho Power to provide "convincing documentation that the portion would be constructed." Ms. Gilbert offers no justification for this provision. Idaho Power maintains it is unnecessary because Idaho Power retains the burden of demonstrating compliance with the conditions in the site certificate. Ms. Gilbert's proposal, as written, also needlessly requires Idaho Power to continue constructing a segment of the facility even if the remainder of the project is not built.

⁴³¹ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 65 of 10016.

Ms. Gilbert has not established that this proposed condition is necessary or appropriate. Idaho Power has explained why the proposed condition is unnecessary. Accordingly, this proposed condition is denied.

15. Gilbert Proposed Condition Regarding Finalization of Monitoring and Mitigation Plans: Prior to the start of construction, the developer will complete all final monitoring and mitigation plans including, but not limited to the “Fire Protection Plan, Travel Management Plan, Blasting Plan, Noise Mitigation Plan, Historic Resources Mitigation Plan, and all other required plans. The plans must be approved by the Energy Facility Siting Council and an Amended Site Certificate must be requested to incorporate these final plans as a part of the Site Certificate.

Ms. Gilbert contends, without further explanation or supporting evidence, that this condition is appropriate under OAR 345-025-0016.⁴³² Gilbert Proposed Conditions at 9-10.

Both the Department and Idaho Power oppose this proposed condition. Idaho Power asserts the proposed condition is unnecessary and redundant for several reasons. The Proposed Order includes many recommended site certificate conditions that require the Company to finalize the draft version of plans prior to facility construction, these final plans will already be subject to the Council’s approval pursuant to OAR 345-025-0016, and the Council must incorporate the individual approved plans into the applicable site certificate conditions. Idaho Power also notes that nothing in OAR 345-025-0016 requires Idaho Power to apply for an amended site certificate. Rather, the activities and/or changes that require a site certificate amendment are specified in OAR 345-027-0350 (Changes Requiring an Amendment).

Ms. Gilbert has not established that this proposed plan finalization condition is necessary or appropriate. Idaho Power has explained why it is unnecessary. Consequently, this proposed condition is denied.

16. Gilbert Proposed Condition Regarding Site Restoration: Developer must remove all concrete footings and support structures to [a] depth of 3 feet below ground level.

Ms. Gilbert argues that the site certificate condition requiring removal of transmission

⁴³² OAR 345-025-0016 states:

In the site certificate, the Council must include conditions that address monitoring and mitigation to ensure compliance with the standards contained in OAR Chapter 345, Division 22 and Division 24. The site certificate applicant, or for an amendment, the certificate holder, must develop proposed monitoring and mitigation plans in consultation with the Department and, as appropriate, other state agencies, local governments and tribes. Monitoring and mitigation plans are subject to Council approval. The Council must incorporate approved monitoring and mitigation plans in applicable site certificate conditions.

line concrete footings to a depth of one foot is too shallow, and will not suffice to return the site to a useful, non-hazardous condition as required by the RFA Standard, OAR 345-022-0050(1). Gilbert Proposed Conditions at 10.

Both the Department and Idaho Power oppose this proposed condition. This is essentially the same condition proposed by limited party Carbiener. For the reasons discussed previously in connection with Issue RFA-2, this proposed condition is not necessary or appropriate.

17. Gilbert Proposed Conditions Regarding Compliance with Site

Conditions: Prior to the start of construction the certificate holder shall develop and implement a plan that verifies compliance with all site certificate terms and conditions and applicable statutes and rules. Certificate holder must document compliance with the site certificate terms and conditions and applicable statutes and rules. Prior to the start of construction, all plans must be finalized, approved by Council, and an amended site certificate must be issued including the final plans.

Ms. Gilbert asserts, without further explanation or supporting evidence, that this proposed condition is required by OAR 345-026-0048.⁴³³ Gilbert Proposed Conditions at 11-12.

Both the Department and Idaho Power oppose this proposed condition. Idaho Power asserts that the proposed condition conflicts with the timing established in Council's rule, which requires the certificate holder to implement a plan that verifies compliance "following receipt of a site certificate or an amended site certificate." OAR 345-026-0048.

Ms. Gilbert has not established that this proposed condition is necessary or appropriate. Idaho Power has explained why the proposed condition conflicts with the provisions of OAR 345-026-0048. Consequently, this proposed condition is rejected.

18. Gilbert Proposed Condition Regarding Special Status Species: Prior to

⁴³³ OAR 345-026-0048 states:

Following receipt of a site certificate or an amended site certificate, the certificate holder shall implement a plan that verifies compliance with all site certificate terms and conditions and applicable statutes and rules. As a part of the compliance plan, to verify compliance with the requirement to begin construction by the date specified in the site certificate, the certificate holder shall report promptly to the Department of Energy when construction begins. Construction is defined in OAR 345-001-0010. In reporting the beginning of construction, the certificate holder shall describe all work on the site performed before beginning construction, including work performed before the Council issued the site certificate, and shall state the cost of that work. For the purpose of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor. The certificate holder shall document the compliance plan and maintain it for inspection by the Department or the Council.

the start of construction on any phase/segment of the development surveys must be performed to identify all Special Status Species having potential habitat within the route as listed in the Revised Final Biological Survey Work Plan to identify habitat impacts and determine required mitigation amounts.

Ms. Gilbert asserts that allowing the proposed facility to “use and cross water resources on Bureau of Reclamation land will place water resources as well as agricultural lands of the state at risk.” Gilbert Proposed Conditions at 12. She further asserts, “Swanson’s hawks have shown difficulty in replacing lost nesting habitat.” *Id.*

Both the Department and Idaho Power oppose this proposed condition as unnecessary and unsupported. Idaho Power further contends that pre-construction field surveys will be conducted in accordance with the Revised Final Biological Survey Work Plan (ASC Exhibit P1, Attachment P1-2), which includes protocols that were reviewed by the Department, ODFW, USFS, FWS, NOAA Fisheries and the BLM.⁴³⁴ Idaho Power consulted with these agencies to determine the appropriate list of special status species to be field surveyed prior to construction, and these expert agencies approved Idaho Power’s approach of field surveying a select prioritized list of special status species, instead of all of the special status species, in the preconstruction surveys.⁴³⁵ Idaho Power contends that a condition proposing field surveys of all special status species within the analysis area goes beyond the scope established by the expert agencies.

Ms. Gilbert has not established that this proposed condition is necessary or appropriate. Idaho Power has explained why the proposed condition is unnecessary and contrary to the field survey plan approved by the Department and consulting expert agencies. Consequently, this proposed condition is denied.

19. Gilbert Proposed Condition Regarding Quiet Areas: Idaho Power will determine if the protected areas, national parks, game preserves and wildlife breeding areas within ½ mile of the proposed transmission line comply with the “quiet areas” standard for noise impacts prior to starting construction on any section of the transmission line and provide the results to the Counsel for review and approval.

In a separate pleading, Ms. Gilbert argues that this condition is necessary because even though the DEQ suspended administration of the Noise Control Rules and can no longer authorize “quiet areas,” this does not negate the fact that such areas exist. Ms. Gilbert further asserts that the areas listed in the proposed condition meet the definition of “quiet areas,” and the Department and Council are required to apply the Noise Control Rules as written. Gilbert Request Regarding B2H Site Certificate Impacts to Quiet Areas at 1-2.

⁴³⁴ ODOE - B2HAPPDoc3-25 ASC 16A_Exhibit P1_Wildlife_ASC_Part 1_Main thru Attach P1-6 rev 2018-09-28, pages 125-550 of 940.

⁴³⁵ See ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 313-16 of 10016.

Both the Department and Idaho Power oppose this condition as unnecessary and unsupported. Idaho Power asserts that DEQ does not maintain a list of quiet areas in the state, and there is no evidence that the agency ever did so.⁴³⁶ Idaho Power also notes that Ms. Gilbert provided no support to her claim that there are designated quiet areas within ½ mile of the proposed transmission line.

In short, Ms. Gilbert has not established that this proposed quiet areas condition is necessary or appropriate. Idaho Power has explained why the proposed condition is not needed. Consequently, this proposed condition is denied.

20. Gilbert Proposed Condition Regarding Notice: All landowners impacted by the decision for the Oregon Department of Energy and Energy Facility Siting Council to issue a Site Certificate to allow the Boardman to Hemingway Transmission Line to impact the project will have on their health, noise levels, views, property values, recreational value, and other qualities of their property must be provided notice as required by ORS 183.415 due to the impact the development will have on their ability to live and work on their property.

Ms. Gilbert submitted this proposed site certificate condition asserting that ORS 183.415 requires the Department and Council to notify owners of identified noise sensitive properties that “the agency intends to allow an exception and variance to allow noise impacts to occur in violation of Oregon Noise standards.”⁴³⁷ Ms. Gilbert did not present any evidence related to this proposed condition, nor did she explain why she believes that the Department’s notice in this contested case proceeding was inadequate or otherwise failed to comply with applicable law. Ms. Gilbert also failed to explain why she believes ORS 183.415 applies to “all landowners impacted by the decision.” Both the Department and Idaho Power oppose this condition.

ORS 183.415 applies to contested cases and sets out the requirement for state agencies to provide “all parties” notice of their right to a hearing in a contested case. “Contested case” is defined in ORS 183.310(2).⁴³⁸ “Party” is defined in ORS 183.310(7).⁴³⁹ Council procedural rule

⁴³⁶ Declaration of Lisa Rackner Regarding Noise Control Issues, Nov. 12, 2021, at 3 and Ex. B.

⁴³⁷ Gilbert Site Certificate Request Regarding B2H Site Certificate Condition Related to Statutory Requirement that Citizens Impacted by a State Action Receive Notice as Specified in ORS 183.415, at 1.

⁴³⁸ As pertinent here, ORS 183.310(2)(a) states:

“Contested case” means a proceeding before an agency:

(A) In which the individual legal rights, duties or privileges of specific parties are required by statute or Constitution to be determined only after an agency hearing at which such specific parties are entitled to appear and be heard;

(B) Where the agency has discretion to suspend or revoke a right or privilege of a person;

OAR 345-015-0014 requires the Department to issue contested case notices for Council contested case proceedings in accordance with ORS 183.415 and OAR 137-003-0001. OAR 345-015-0014(2) requires the Department to send “a contested case notice * * * to the applicant or certificate holder, and to each party or limited party to the contested case.” The notice requirements of ORS 183.415, OAR 137-003-0001, and OAR 345-015-0014(2) do not attach until the matter becomes a contested case.⁴⁴⁰ Consequently, the Department has no obligation under ORS 183.415 to send notice to all landowners potentially impacted by the proposed facility. The Department’s notice obligation under ORS 183.415 is limited to the parties in the contested case. Accordingly, this proposed condition is denied.

21. Gilbert Proposed Revisions to Recommended Amended Fish and Wildlife Condition 16: Requiring species-specific surveys for bats and post-construction surveys for all species listed in Recommended Fish and Wildlife Condition 16.

On February 28, 2022, the due date for written closing arguments, Ms. Gilbert submitted a “Closing Brief Regarding Idaho Power Site Certificate Recommendation Submitted with FW-9 Summary Determination Request,” proposing changes to Recommended Amended Fish and Wildlife Condition 16.⁴⁴¹ Ms. Gilbert proposed returning state sensitive bat species to the list of

(C) For the suspension, revocation or refusal to renew or issue a license where the licensee or applicant for a license demands such hearing; or

(D) Where the agency by rule or order provides for hearings substantially of the character required by ORS 183.415, 183.417, 183.425, 183.450, 183.460 and 183.470.

⁴³⁹ ORS 183.310(7) states:

“Party” means:

(a) Each person or agency entitled as of right to a hearing before the agency;

(b) Each person or agency named by the agency to be a party; or

(c) Any person requesting to participate before the agency as a party or in a limited party status which the agency determines either has an interest in the outcome of the agency’s proceeding or represents a public interest in such result. * * *.

⁴⁴⁰ The Council’s obligation to provide public notice upon receipt of a notice of intent to file an application for site certificate or an application for site certificate are set out in ORS 469.330 through 469.370, and OAR chapter 345, division 015. Pursuant to OAR 345-015-0230(3), following issuance of a proposed order, the Department must issue a public notice of the proposed order. That public notice must include certain information, including a summary of the recommendations in the proposed order and a description of the process and deadline for requests to participate as a party or limited party in the contested case under OAR 345-015-0016.

⁴⁴¹ As discussed previously herein, in the August 17, 2021 *Ruling on Issues FW-9, FW-10, FW-11 and LU-10*, the ALJ recommended that, in Recommended Fish and Wildlife Condition 16, “State Sensitive

required preconstruction surveys and proposed requiring post-construction surveys for all species listed in the condition. Ms. Gilbert argued that she could not object to Idaho Power's Motion for Summary Determination on Issue FW-9 because of a lack of standing on that issue, but she is nevertheless entitled under the Council's rules to propose conditions and to present evidence and argument regarding Recommended Amended Fish and Wildlife Condition 16.

Ms. Gilbert is correct that, under OAR 345-015-0085, a party or limited party may propose site certificate conditions and may present evidence and argument concerning proposed conditions. However, the proposed condition amendment is unnecessary and inappropriate for the reasons set forth in the *August 17, 2021 Ruling and Order on IPC's Motion for MSD of Contested Case Issues FW-9, FW-10, FW-11 and LU-10* (p.7).

As stated in that ruling, in the Department's Proposed Order on the ASC, recommended Fish and Wildlife Condition 16 was amended to include a requirement that protocol-level surveys for "State Sensitive bat species" be conducted as a preconstruction survey. This change was intended to align recommended Fish and Wildlife Condition 12 and 16 – Fish and Wildlife Condition 12 is a condition that applies during construction – and requires reporting to the Department of incidental finds of sensitive species, including State Sensitive bat-species. Fish and Wildlife Condition 16 is a condition that applies at preconstruction – and requires preconstruction, protocol level surveys of certain species. However, the change made by the Department in the Proposed Order was in error because under recommended Fish and Wildlife Condition 12, the applicant would be required to document any State Sensitive bat species and unique habitat for bats (i.e. bat roosts) observed during other biological surveys, it did not require that separate, protocol level surveys be conducted for State Sensitive bat species. The Department's proposed revision to Fish and Wildlife Condition 16, as presented in the Proposed Order on the ASC, therefore exceeded the intent of ensuring the conditions were consistent and added a new requirement, without sufficient basis, for protocol level of surveys of State Sensitive bat species. Ms. Gilbert did not provide evidence to support the requested requirement for inclusion of protocol-level State Sensitive bat species or post-construction surveys for all species.

Geer Additional Proposed Site Conditions

1. Geer Proposed Revised Condition Regarding Trifolium Douglasii

Request that Idaho Power revise its plans to completely bypass Morgan Lake Park property and to avoid *Trifolium douglasii* (rare plant) occurrences wherever they are found. To avoid negative impacts to nesting success of bald eagles and sandhill cranes the Project ROW should be removed from this area by at least ¼ mile.

Ms. Geer timely submitted this proposed condition in connection with her direct testimony on Issues FW-3 and FW-6 and her Closing Arguments, but did not offer any further explanation or evidence in support of this proposal.

Both the Department and Idaho Power oppose the proposed condition. The Department asserts that the proposed condition is not necessary to meet the requirements of ORS Chapter 569. Idaho Power asserts (1) the project site boundary does not cross any portion of Morgan Lake Park and (2) there is no applicable Council standard requiring Idaho Power to avoid

Trifolium douglasii because the plant is not on the State List of Threatened and Endangered Species (OAR 603-073-0070).

Because Ms. Geer has not provided evidence to support the proposed condition and Idaho Power has explained why it is not necessary, the proposed condition is denied.

2. Geer Proposed Condition Regarding Sandhill Cranes: The developer will provide UV lights on the B2H transmission lines from central Baker County to

bat species” be removed from the list of required surveys and that footnote 373 of the Proposed Order be deleted.

the Umatilla County Line.

Ms. Geer contends that sandhill cranes are protected by the Migratory Bird Treaty Act of 1918, they are an Oregon Conservation Strategy Species, and are listed as Sensitive by the ODFW. She argues that because the sandhill crane is a federally protected species, because ODFW is to make recommendations regarding the protection of federally protected species when necessary, and because the proposed transmission line is in the migratory pathway of the sandhill crane, it is appropriate to require this mitigation to minimize the likelihood of fatalities to the cranes. Geer Requested Site Certificate Condition be Included in the Final Order at 1.

Both the Department and Idaho Power oppose this proposed condition. Idaho Power adds that its Avian Protection Plan guides the Company's efforts to protect raptors and other large birds from harm from transmission lines and poles. Idaho Power asserts that its Avian Protection Plan is sufficient to satisfy the Council's Fish and Wildlife Habitat Standard as it relates to the sandhill crane and that no additional measures (such as flight diverters or UV lights) are required.⁴⁴² Idaho Power adds that in the event ODFW identifies specific sites along the completed project that result in elevated risks of crane collisions, it will consider potential actions to address those risks.⁴⁴³

In the Proposed Order, the Department discussed Idaho Power's Avian Protection Plan (Attachment P1-9 to the Proposed Order) in connection with the risk of bird electrocutions along the proposed transmission lines. Noting that the risk of avian mortalities resulting from electrocutions is very low for high-voltage transmission lines, the Department nevertheless included Recommended Fish and Wildlife Condition 10 requiring Idaho Power to construct the transmission line to avian-safe design standards, consistent with the Avian Protection Plan.⁴⁴⁴ The Department also noted as follows:

ODFW has historically provided guidance to ODOE that its Fish and Wildlife Habitat Mitigation Policy, implemented under Council's standard, applies to terrestrial (land-based) environments, and has not developed guidance to date supporting or recommending assessment of airspace (or bird flight corridors) as habitat, for which to then assign a habitat category and evaluate impacts and mitigation goal obligations. Therefore, the Department does not consider imposing a requirement for specific technology (UV light technology) appropriate under the Council's standard, but considers it consistent with OAR 345-025-0016 to require agency consultation during implementation of the Avian Protection

⁴⁴² See Idaho Power's Responses to DPO Comments, ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, page 7602 of 10016 (responding to ODFW's comments regarding sandhill crane migration and flight diversion technology).

⁴⁴³ *Id.*

⁴⁴⁴ ODOE - B2HAPPDoc2 Proposed Order on ASC and Attachments 2019-07-02, pages 338-41 of 10016.

Plan.⁴⁴⁵

Ms. Geer has not provided evidence to support the proposed condition. Furthermore, there is evidence in the B2H Project Record to the contrary. The Department opted not to require UV lighting technology on the transmission lines. Accordingly, Ms. Geer's proposed condition regarding sandhill crane protection is denied.

ORDER

I propose the Oregon Department of Energy, Energy Facility Siting Council, issue a Final Order granting the requested site certificate consistent with the Department's Proposed Order dated July 2, 2020, including the recommended site certificate conditions, and incorporating the following amendments to recommended conditions:

Noise Control

Amended Recommended Noise Control Condition 1:

Prior to construction, the certificate holder will initiate discussions with the following 41 NSR property owners at which it has estimated exceedances of the ambient antidegradation standard may occur identified in Attachment X-5 and/or Attachment X-4 of the Final Order on the ASC (NSR: 8, 9, 10, 11, 5002, 69, 70, 5004, 46, 118, 125, 5010, 5011, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 518, 111, 112, 132, 133, 5008, 5009, 113, and 115) to develop mutually agreed upon Noise Exceedance Mitigation Plans, specific to each NSR location. The site-specific Noise Exceedance Mitigation Plans will include agreed upon measures that would be implemented at the NSR location to minimize or mitigate the ambient antidegradation standard noise exceedance.

- a. If the certificate holder and the NSR property owner agree upon a specific Noise Mitigation Plan, the certificate holder will submit a signed acknowledgement from the property owner to the Department for its records.
- b. If an agreement between certificate holder and NSR property owner is not obtained, the certificate holder shall concurrently notify the Department and NSR property owner of the dispute and of Council review of the dispute to occur at the next regularly scheduled Council meeting, to the extent possible, from the date of the certificate holder's notice. The notice shall explain that the NSR property owner will be given an opportunity to provide comments to the Council on the dispute, unless the Council Chair defers the dispute review to the Department. Review of the dispute will be based on the information per sub(i) below, and any other relevant facts provided by the NSR property owner and will result in a determination of the appropriate mitigation measure(s), proportional to the facility operational noise levels in excess of the ambient degradation standard, as

⁴⁴⁵ *Id.* at 341 of 10016.

determined to occur at the NSR property. The Council or Department's determination of appropriate mitigation is not binding on the NSR property owner or certificate holder if the NSR property owner opts not to accept the mitigation.

i. At the time of issuance of the notice per (b) above, certificate holder will submit to the Department: (1) the mitigation measures it offered the NSR property owner, the mitigation measures that the NSR property owner requested and an explanation of the dispute; (2) a list of the dates that the certificate holder communicated with, or attempted to communicate with, the NSR property owners; and (3) the names, addresses, and phone numbers of the NSR owners.

c. In working with NSR property owners under this condition, certificate holder will propose corona-noise mitigation of installation of sound-attenuating windows for residential structures as follows:

i. For NSRs where an 11 to 14 dBA sound level increase above ambient noise levels are expected, certificate holder will purchase and install sound attenuating windows with an STC rating of 25-40.

ii. For NSRs where a 15 dBA or greater sound level increase is expected, certificate holder will purchase and install sound attenuating windows with an STC rating of above 40.

iii. If an owner of an NSR where an 11 dBA or greater sound level increase is expected provides a letter from a health care provider indicating that health care provider's belief that the owner has a health condition that is exacerbated by increased sound levels, upon request, certificate holder will purchase and install sound attenuating windows with an STC rating of over 40 and would work with the NSR property owner to consider other mitigation options, as appropriate. During landowner consultations required under this condition, the certificate holder will specifically ask each landowner whether that landowner has a health condition that the landowner believes is exacerbated by elevated sound levels.

iv. At the request of an NSR property owner, certificate holder will offer alternative mitigation proposals, such as performing air-sealing of the NSR residence, planting trees, or installing insulation.

d. Prior to operation, the certificate holder will implement the mitigation measures agreed upon with the NSR property owners and/or as determined by EFSC or the Department to be the appropriate mitigation measures.

Amended Recommended Noise Control Condition 2:

a. After the Site Certificate has been issued and before landowner consultations contemplated in Condition 1, the certificate holder will prepare a new version of Attachment X-7, which will update landowner information and correct any errors (Updated Attachment X-7). The certificate holder will send notices to all landowners listed in Updated Attachment X-7, which notice shall inform the recipient: (a) that the recipient is the owner of an NSR; (b) the requirements and condition language of the Noise Control as adopted by the Council; and (c) a plain summary of the steps designated Noise Control Conditions 1 and 2. In addition, prior to construction, the certificate holder shall develop and submit to the Department an operational noise complaint response plan as well as distribute a simplified operational noise complaint response plan for landowners to the landowners listed in Updated Attachment X-7.

b. The plan shall specify that it is intended to address complaints filed by persons falling into one of the following categories: (1) the owner of an NSR property identified in Noise Control Condition 1, and for whom has received mitigation under Noise Control Condition 1, but who believes that exceedances (as measured at their NSR property) are occurring in a manner not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5; or (2) An owner of an NSR property within one mile of the site boundary who was not identified under Noise Control Condition 1 and who has not received mitigation from the certificate holder, but who nevertheless believes that exceedances above the ambient degradation standard have occurred at their NSR property.

c. The plan shall include the following: Scope of the complaint response plan, including process for complaint filing, receipt, review and response. The scope shall clearly describe how affected persons will be provided necessary information for filing a complaint and receiving a response, and will specify the information that the complainant must include in its complaint, including the date the certificate holder received the complaint, the nature of the complaint, weather conditions of the date for which the complaint is based (including wind speed, temperature, relative humidity, and precipitation), duration of perceived noise issue, the complainant's contact information, and the location of the affected property.

d. The plan shall require that the certificate holder notify the Department within three working days of receiving a noise complaint related to the facility. The notification shall include the date the certificate holder received the complaint, the nature of the complaint, weather conditions of the date for which the complaint is based (such as wind speed, temperature, relative humidity, and precipitation) as described by the complainant, duration of perceived noise issue, the complainant's contact information, the location of the affected property, and a schedule of any actions taken or planned to be taken by the certificate holder (including inspection and maintenance actions, or actions taken or planned to be taken pursuant to the processes described in subsection (e) of this condition).

e. The plan shall identify the following process if a noise complaint is received:

i. The certificate holder shall assess possible causes of the corona noise. If the complaint is received within the first 12 months of operation, the certificate holder will assess whether the corona noise is typical of noise that occurs during the transmission line "burn in period" (the first 12 months of operation) and ensure that it already has taken appropriate measures near that NSR to minimize corona noise that may occur during the burn in period (e.g., use conductors with a nonspecular finish/sandblasting of conductors to make them less reflective and clean them of manufacturing oils, protect the conductors to minimize scratching and nicking during construction). If the exceedance occurs during the burn-in period, and if the certificate holder complies with the requirements of this condition, the certificate holder will not be found to be in violation of its site certificate because of the exceedance.

ii. If it is determined the corona noise is not typical burn in period noise, the certificate holder will assess whether the noise exceeds the ambient antidegradation standard in a manner not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5. If the complainant's noise sensitive property or properties are included in Attachment X-5 of the Final Order on the ASC, the modeled sound level increases as presented in Attachment X-4 of the Final Order on the ASC may be relied upon to determine whether the corona noise exceeds the ambient antidegradation standard, unless the complainant voluntarily provides alternative noise data.

iii. If the complainant's NSR property or properties are not included in Attachment X-5 of the Final Order on the ASC, the certificate holder shall model the sound level increases using the methods set forth in ASC Exhibit X, unless the complainant voluntarily provides alternative noise data.

iv. If the complainant voluntarily provides alternative noise data and the data suggests an exceedance that had not previously been identified and mitigated, and/or an exceedance not otherwise allowed under Noise Control Condition 4 or Noise Control Condition 5, the complaint shall be verified through site specific sound monitoring conducted by an Oregon registered Professional Engineer, Board Certified by the Institute of Noise Control Engineering noise specialist, employed or contracted by the certificate holder, in accordance with NPCS-1 unless otherwise approved by the Department. If site specific sound monitoring is not authorized by the complainant, the certificate holder's modeling results may be relied upon to determine compliance.

v. In the event of a dispute regarding complainant's noise data and the certificate holder's data from site specific sound monitoring, certificate holder shall request that EFSC, in consultation with the Department's

noise consultant, if necessary, make the final determination regarding which data will be used to determine whether corona noise exceeds the ambient antidegradation standard and/or in a manner not allowed under Noise Control Condition 4 or Noise Control Condition 5. The EFSC Chair may direct the Department to make this determination.

f. The plan shall specify that if it is determined pursuant to the process described in subsection (e) of this condition that corona noise at the complainant's NSR property exceeds the ambient antidegradation standard in a manner not allowed under Noise Control Condition 4 or Noise Control Condition 5, and/or exceeds the ambient antidegradation standard at an NSR property that had not previously been predicted to experience exceedances under Noise Control Condition 1, the certificate holder shall work with the NSR property owner to develop a mutually agreed upon mitigation plan to include agreed upon measures that would be implemented at the NSR location to minimize or mitigate the ambient antidegradation standard noise exceedance. To be clear, the fact that the certificate holder has received an exception or variance under Noise Control Conditions 4 and 5 does not excuse the certificate holder from providing mitigation under this condition.

i. If the NSR property was identified in Noise Control Condition 1 and has previously received mitigation by the certificate holder, and if it has been determined that the NSR property experiences exceedances not allowed under Noise Control Condition 4 or Noise Control Condition 5, the certificate holder will work with the complainant to identify supplemental mitigation measures, which may include any of the measures discussed in Noise Control Condition 1 or the ASC, or other measures requested by the complainant.

ii. If the NSR property was not identified in Noise Control Condition 1 and has not been provided with mitigation by the certificate holder, certificate holder will work with the NSR property owner to identify appropriate mitigation measures, which may include any of the measures discussed in Noise Control Condition 1 or the ASC, or other measures requested by the landowner.

iii. If, through the efforts described above, the certificate holder executes an agreement with the NSR property owner, the certificate holder will submit a signed acknowledgement from the property owner to the Department for its records. If an agreement between certificate holder and NSR property owner is not obtained, the certificate holder shall concurrently notify the Department and NSR property owner of the dispute and of Council review of the dispute to occur at the next regularly scheduled Council meeting, to the extent possible, from the date of the certificate holder's notice. The notice shall explain that the NSR property owner will be given an opportunity to provide comments to the Council on

the dispute, unless the Council defers the dispute review to the Department. Review of the dispute will be based on the information per (iv) below, and any other relevant facts provided by the NSR property owner and will result in a determination of the appropriate mitigation measure(s), proportional to the facility operational noise levels in excess of the ambient degradation standard, as determined to occur at the NSR property. The Council or Department's determination of appropriate mitigation is not binding on the NSR property owner or certificate holder if NSR property owner opts not to accept the mitigation.

iv. At the time of issuance of the notice per (iii) above, certificate holder will submit to the Department: (1) the mitigation measures it offered the NSR property owner, the mitigation measures that the NSR property owner requested and an explanation of the dispute; (2) a list of the dates that the certificate holder communicated with, or attempted to communicate with, the NSR property owners; and (3) the names, addresses, and phone numbers of the NSR owners.

g. The certificate holder shall provide necessary information to the complainant to support understanding of corona noise, corona noise levels and effects, and of the process to verify actual noise levels of events resulting in complaints. If the complainant opts not to authorize the certificate holder to conduct monitoring, and it is otherwise determined pursuant to the process described in subsection (e) of this condition that corona noise does not exceed the ambient antidegradation standard, the noise complaint shall be considered fully resolved and no mitigation shall be required.

Amended Recommended Noise Control Condition 4:

During operation:

a. Pursuant to OAR 340-035-0010, an exception to compliance with the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) (which prohibits an increase of more than 10 dBA above ambient sound pressure levels) is granted during facility operation when there is foul weather (a rain rate of 0.8 to 5 millimeters per hour), which Council finds constitutes an infrequent event under OAR 340-035-0035(6)(a).

b. The ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) may be exceeded by the transmission line at any time of day or night during foul weather events (defined as a rain rate of 0.8 to 5 millimeters per hour). [OAR 340-035-0010(2)]

c. The quantity and quality of noise generated in exceedance of the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B), during foul weather events (defined as a rain rate of 0.8 to 5 millimeters per hour), shall not be more than 10 dBA (i.e., ambient plus 20 dBA). [OAR 340-035-0010(2)]

Amended Recommended Noise Control Condition 5:

During operation:

- a. A variance to compliance with the ambient antidegradation standard at OAR 340-035-0035(1)(b)(B) (which prohibits an increase of more than 10 dBA above ambient sound pressure levels) is granted pursuant to OAR 340-035-0100(1) for the transmission line at any time of day or night during foul weather events (defined as a rain rate of 0.8 to 5 millimeters per hour).
- b. The quantity and quality of noise generated in exceedance of the ambient antidegradation standard shall not be more than 10 dBA (*i.e.*, ambient plus 20 dBA), as measured at any NSR location.

Public Services

Second Amended Recommended Public Services Condition 6: Prior to construction of a facility phase or segment, in accordance with the OAR 345-025-0016 agency consultation process outlined in the plan (Attachment U-3 of the Final Order on the ASC), the certificate holder shall submit final Fire Prevention and Suppression Plan(s) to the Department. The plan finalization process shall consider (a)(i) and (a)(ii) unless otherwise identified by a land management agency or other participating review agency:

a) The protective measures as described in the draft Fire Prevention and Suppression Plan as provided in Attachment U-3 of the Final Order on the ASC and:

i. Wildfire training for onsite workers and facility personnel be conducted by individuals that are National Wildfire Coordination Group and Federal Emergency Management Agency certified.

ii. Specific seasonal work restrictions, onsite fire-fighting equipment and necessary fire protection resources based on: 1) documented evaluation of reasonably available sources related to wildfire risk and sensitive seasonal conditions such as high temperatures, drought and high winds; and, 2) update Table PS-9 of the Proposed Order based on information obtained from the LGRFPD on the number of full-time and volunteer employees, number and type of equipment/vehicles, and response times to the facility. Response time must consider LGRFPD crew mobilization time and access limitations (e.g., road condition, level of service and impact of multi-users from Morgan Lake Park, residents and emergency services).

b) A description of the fire districts and rural fire protection districts that will provide emergency response services during construction and copies of any agreements between the certificate holder and the districts related to that

coverage.

c) All work must be conducted in compliance with the approved plan during construction and operation, as applicable, of the facility.

Amended Recommended Public Services Condition 7: The certificate holder shall:

a. Prior to operation, provide a copy of its Wildfire Mitigation Plan to the Department and each affected county which provides a wildfire risk assessment and establishes action and preventative measures based on the assessed operational risk from and of wildfire in each county affected by the facility.

b. During operation, the certificate holder shall update the Wildfire Mitigation Plan on an annual basis, or frequency determined acceptable by the Department in consultation with the Oregon Public Utilities Commission.

c. During operation, for the service territories the facility would be located within, the certificate holder shall provide to each of the fire districts and rural fire protection a contact phone number to call in the event a district needs to request an outage as part of a fire response.

d. Any Wildfire Mitigation Plan required by the Oregon Public Utilities Commission shall be considered by EFSC as meeting the requirements of this condition.

New Recommended Public Services Condition:

Prior to construction or road modification in any area designated as a geologic hazard zone by Oregon Department of Geology and Mineral Industries (DOGAMI) data and maps (e.g., as landslide or debris flow fan), or by relevant local zoning ordinances and maps, the site certificate holder and/or its construction contractors will consult with a licensed civil engineer to assess the proposed construction or road design in relation to potential geologic hazards.

Soil Protection/Blasting Plan

Amended Recommended Soil Protection Condition 4:

a. Prior to construction, in accordance with the OAR 345-025-0016 agency consultation process outlined in the draft Framework Blasting Plan (Attachment 20 G-5 of the Final Order on the ASC), the certificate holder shall finalize, and submit to the Department for approval, a final Blasting Plan. The final Blasting Plan shall meet all applicable federal, state and local requirements related to the transportation, storage, and use of explosives.

b. Prior to construction, the certificate holder will consult with landowners

regarding right-of-way acquisition, and during these consultations, the certificate holder will discuss with the landowner any blasting that the certificate holder plans to conduct on the landowner's property. If the landowner identifies a natural spring or well on the property, the certificate holder will notify the landowner that at the landowner's request, the certificate holder shall conduct pre-blasting baseline flow and water quality measurements for turbidity. The certificate holder shall compensate the landowner for adequate repair or replacement if damages to the flow or quality of the natural spring or well occur solely as a result of blasting.

c. During construction, the certificate holder shall conduct all work in compliance with the final Blasting Plan approved by the Department.

Fish Passage

Amended Recommended Fish Passage Condition 1(a):

a) Prior to construction, the certificate holder shall finalize, and submit to the Department for its approval in consultation with ODFW, a final Fish Passage Plan. As part of finalizing the Fish Passage Plan, the certificate holder shall request from ODFW any new information on the status of the streams within the site boundary and shall address the information in the final Fish Passage Plan. In addition, the certificate holder shall seek concurrence from ODFW on the fish-presence determinations for non-fish bearing streams within the Ladd Creek watershed, as presented in ASC Exhibit P1-7B Table 3. If the certificate holder in consultation with ODFW, determines any of the previously identified non-fish bearing streams within the Ladd Creek Watershed to be fish-bearing, the certificate holder shall complete a crossing risk evaluation and obtain concurrence from ODFW on applicability of fish passage requirements. If fish passage requirements apply, certificate holder shall seek approval from the Energy Facility Siting Council of a site certificate amendment to incorporate ODFW approval of new crossings and fish passage design/plans and conditions. The protective measures described in the draft Fish Passage Plan in Attachment BB-2 to the Final Order on the ASC, shall be included as part of the final Fish Passage Plan, unless otherwise approved by the Department.

[The remainder of Fish Passage Condition 1, paragraphs (b) and (c), remain unchanged from the Proposed Order.]

EXECUTION

Issued by Council-Appointed Hearing Officer:

Alison Greene Webster
Senior Administrative Law Judge
Office of Administrative Hearings

Amended and Adopted by the Oregon Energy Facility Siting Council:


Kent Howe (Oct 6, 2022 10:49 PDT)
Vice Chair, Kent Howe
Oregon Energy Facility Siting Council

**APPENDIX 1
 TABLE OF ADDITIONAL ADMITTED EVIDENCE**

Issue	Offered By	Testimony/Exhibit	Document Description
M-6	Marlette	JoAnn Marlette Declaration	Written testimony
	Marlette	Irene Gilbert Declaration	Written testimony
	Marlette	Marlette Exhibit 5	IPC Response to Discovery Request No. 2
	Marlette	Marlette Exhibit 6	IPC Response to Discovery Request No. 1
	Idaho Power	Joseph Stippel Rebuttal Testimony	Rebuttal testimony
	Idaho Power	Stippel Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Stippel Rebuttal Exhibit B	Final Environmental Impact Statement excerpt
F'W-3	Gilbert	Irene Gilbert Declaration	Written testimony
	Gilbert	Joann J. Harris Rode Declaration	Written testimony
	Gilbert	Gilbert Exhibit 4	Union County Weed Control Comments
	Gilbert	Gilbert Exhibit 9	ODOE Response to Discovery Request
	Gilbert	Gilbert Exhibit 11	ODA - Economic Impact From Selected Noxious Weeds in Oregon
	Gilbert	Gilbert Exhibit 12	ODA – Invasive Noxious Weed Control Program Annual Report 2020
	Gilbert	Gilbert Exhibit 15	ODFW – Oregon Conservation Strategy, Chapter 2: Key Conservation Issues
	Geer	Susan Geer Declaration	Written testimony
	Geer	Karen Antell Declaration	Written testimony
	Geer	Mark Darrach Declaration	Written testimony
	Geer	Bryan Endress Declaration	Written testimony
	Idaho Power	Jessica Taylor Rebuttal Testimony	Written testimony
	Idaho Power	Taylor Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Taylor Rebuttal Exhibit B	Updated Draft Noxious Weed Plan, 11-12-21
	Idaho Power	Taylor Rebuttal Exhibit C	ODA – Noxious Weed Policy and Classification System 2020
	Idaho Power	Taylor Rebuttal Exhibit D	Union County Noxious Weed List - 2019
	Idaho Power	Taylor Rebuttal Exhibit E	ODFW – Oregon Conservation Strategy, Chapter 1: Overview
	ODOE	Tim Butler (ODA) Rebuttal Testimony	Written testimony
	Gilbert	Irene Gilbert Surrebuttal Testimony	Written testimony
	Geer	Susan Geer Surrebuttal Testimony	Written testimony
	Geer	Ed Mosiman Surrebuttal Testimony	Written testimony
	Idaho Power	Jessica Taylor Sur-surrebuttal Testimony	Written testimony
	Idaho Power	Declaration of Jessica Taylor in Support of Idaho Power's Response to ODOE's Proposed Conditions	Written testimony
	Idaho Power	Attachment 1 to Taylor Declaration	Malheur County Noxious Weeds List
	Idaho Power	Attachment 2 to Taylor Declaration	Baker County Noxious Weeds List
		Jessica Taylor Cross-Examination Hearing Testimony	Hearing Transcript – Day 4 (Jan. 14, 2022)
		Mark Porter (ODA) Cross-Examination Hearing Testimony	Hearing Transcript – Day 7 (Jan. 21, 2022)

	Idaho Power	Transcript Corrections to Cross-Examination Hearing Days 4 and 7	Corrections to Hearing Transcripts -- Days 4 and 7
FW-5	N/A	(no additional evidence offered)	
FW-6	Geer	Susan Geer Declaration	Written testimony
	Geer	Karen Antell Declaration	Written testimony
	Geer	Mark Darrach Declaration	Written testimony
	Geer	Bryan Endress Declaration	Written testimony
	Geer	Geer Exhibit 3	ODA – Invasive Noxious Weed Control Program Annual Report 2020
	Geer	Geer Exhibit 6	Vegetation of Winn Meadow, Glass Hill, Union Co., Oregon, August 16, 2011
	Idaho Power	Jessica Taylor Rebuttal Testimony	Written testimony
	Idaho Power	Taylor Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Taylor Rebuttal Exhibit B	Updated Draft Noxious Weed Plan, 11-12-21
	Idaho Power	Taylor Rebuttal Exhibit C	ODA – Noxious Weed Policy and Classification System 2020
	Idaho Power	Taylor Rebuttal Exhibit D	Union County Noxious Weed List - 2019
	Idaho Power	Taylor Rebuttal Exhibit E	ODFW – Oregon Conservation Strategy, Chapter 1: Overview
	Geer	Susan Geer Surrebuttal Testimony	Written testimony
	Geer	Ed Mosiman Surrebuttal Testimony	Written testimony
	Geer	Geer Surrebuttal Exhibit 1S	Article: Managing Invasive Plants in Natural Areas: Moving Beyond Weed Control, 2009
	Geer	Geer Surrebuttal Exhibit 2S	Article: Management Strategies for Invasive Plants in Pacific Northwest Prairies, Savannas, and Oak Woodlands.
	Geer	Geer Surrebuttal Exhibit 3S	Safeguarding the Nation from Impacts of Invasive Species
	Geer	Geer Surrebuttal Exhibit 4S	Oregon Natural Areas Plan 2020
	Idaho Power	Jessica Taylor Sur-surrebuttal Testimony	Written testimony
	Idaho Power	Declaration of Jessica Taylor in Support of Idaho Power's Response to ODOE's Proposed Conditions	Written testimony
	Idaho Power	Attachment 1 to Taylor Declaration	Malheur County Noxious Weeds List
	Idaho Power	Attachment 2 to Taylor Declaration	Baker County Noxious Weeds List
FW-7	March	Kevin and Anne March Testimony	Written testimony
	March	March Exhibit 1	ODFW Response to March Discovery Request
	March	March Exhibit 2	USDA B2H Record of Decision
	March	March Exhibit 3	Ladd Steelhead Habitat Map
	March	March Exhibit 4	2016 Ladd Creek Sts SGS Notes
	March	March Exhibit 5	2018 ODOT Ladd Canyon Project
	March	March Exhibit 6	ODOT News Release 12-18-20
	March	March Exhibit 7	ODFW Sensitive Species List
	March	March Exhibit 8	ODFW Fish Passage webpage
	March	March Exhibit 9	Ladd Marsh Wildlife Area Management Plan
	March	March Exhibit 10	Catherine Creek Tributary Assessment

March	March Exhibit 11	ODOT Culvert Replacement Report
March	March Exhibit 12	Endangered Species Act of 1973
March	March Exhibit 13	NOAA – Snake River Basin Steelhead
March	March Exhibit 14	ODFW Habitat Mitigation webpage
March	March Exhibit 15	Article – Summer Steelhead fishing, 8-28-21
March	March Exhibit 16	Article – Record Low Numbers of Steelhead Returning to Columbia River, 8-28-21
March	March Exhibit 17	NOAA – Ladd Canyon Protected Resources
ODOE	Greg Apke (ODFW) Rebuttal Testimony	Written testimony
ODOE	Sara Reif (ODFW) Rebuttal Testimony	Written testimony
Idaho Power	Chris James Rebuttal Testimony	Written testimony
Idaho Power	James Rebuttal Exhibit A	Curriculum Vitae
Idaho Power	James Rebuttal Exhibit B	Project Crossings in Upper Ladd Creek Watershed Proposed on Streams Identified in 2021 ODFW Summer Steelhead Distribution Map
Idaho Power	James Rebuttal Exhibit C	Project Crossings in Upper Ladd Creek Watershed Proposed Outside Streams Identified in 2021 Summer Steelhead Distribution Map
Idaho Power	James Rebuttal Exhibit D	Fish Habitat and Stream Crossing Assessment Summary Report, October 2014
Idaho Power	James Rebuttal Exhibit E	Fish Habitat and Crossing Assessment Plan, May 2014
Idaho Power	James Rebuttal Exhibit F	Fish Habitat and Stream Crossing Assessment Summary, December 2016
Idaho Power	James Rebuttal Exhibit G	ODFW Responses to March Discovery Requests
Idaho Power	James Rebuttal Exhibit H	ODFW Geodatabase Data
March	Kevin and Anne March Surrebuttal Testimony	Written testimony
March	March Surrebuttal Exhibit A	<u>ODFW Memo re: Clarification of Fish Passage Triggers and Guidelines for Bridges, March 28, 2008</u>
March	March Surrebuttal Exhibit B	<u>ODFW Fish Passage Priority List, Feb. 1, 2013</u>
March	March Surrebuttal Exhibit C	<u>ODFW Fish Passage Requirements</u>
	Greg Apke (ODFW) Cross-Examination Hearing Testimony	Hearing Transcript – Day 5 (Jan. 18, 2022)
	Sarah Reif (ODFW) Cross-Examination Hearing Testimony	Hearing Transcript – Day 5 (Jan 18, 2022)
	Chris James Cross-Examination Hearing Testimony	Hearing Transcript – Day 5 (Jan 18, 2022)
March	<u>March Cross-Examination Exhibit 6A - video clip</u>	<u>ODOT Safety Projects Region 5 – video regarding ODOT's I-84 fish passage improvements project (Aug. 18, 2020)</u>
March	March Corrections to January 18, 2022 Hearing Transcript	Corrections to Hearing Transcript – Day 5
Idaho Power	Idaho Power Transcript Corrections to Cross-Examination Hearing Transcript Day 5	Corrections to Hearing Transcript – Day 5

	ODOE	ODOE Corrections to Cross-Examination Hearing Transcript Day 5	Corrections to Hearing Transcript – Day 5
HCA-3	Marlette	JoAnn Marlette Affidavit	Written testimony
	Marlette	Marlette Exhibit 1-J	Sarah LeCompte letter, August 14, 2021
	Marlette	Marlette Exhibit 1	Chicago Tribune article, Follow the Footsteps – or Wagon Ruts – of Pioneer’s Historic Trail, June 18, 2018
	Marlette	Marlette Exhibit 2	Oregon VIA Magazine excerpt, page 6, July-August 2018
	Marlette	Marlette Exhibit 3	Baker City Herald article, Tourism Spending Continues to Rise, May 8, 2019
	Marlette	Marlette Exhibit 4	Baker City Herald article, Selling Baker County, May 10, 2019
	Marlette	Marlette Exhibit 5	Article, Electric Transmission Visibility and Visual Contrast Threshold Distances in Western Landscapes
	Marlette	Marlette Exhibit 8	B2H Historic Properties Management Plan, pages 20-22, September 2018
	Marlette	Marlette Exhibit 9	IPC’s Response to Gilbert’s Discovery Request No. 4, February 5, 2021
	Marlette	Marlette Exhibit 10	IPC’s Response to Gilbert’s Discovery Requests, March 12, 2021
	Marlette	Marlette Exhibit 11	IPC’s Response to Deschner’s Discovery Request No. 4, February 5, 2021
	Marlette	Marlette Exhibit 16	NHOTIC Overlay Zone
	Marlette	Marlette Exhibit 17	Photos taken at NHOTIC
	Gilbert	Irene Gilbert Testimony	Written testimony
	Gilbert	Gilbert Exhibit 4	IPC Supplemental Response to Gilbert’s Discovery Requests
	Idaho Power	Kirk Ranzetta Rebuttal Testimony	Written testimony
	Idaho Power	Ranzetta Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Ranzetta Rebuttal Exhibit B	BLM – Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM Lands, 2013
	Idaho Power	Ranzetta Rebuttal Exhibit C	National Registration of Historic Places Registration Form for Oregon Trail: La Grande to Hilgard Segment
	Idaho Power	Ranzetta Rebuttal Exhibit D	Letter from Tetra Tech to John Williams
HCA-4	Horst/Cavinato	Joe Horst Direct Testimony	Written testimony
	Horst/Cavinato	Horst Exhibit C	Arial photograph -- Hawthorne Dr.
	Horst/Cavinato	Horst Exhibit I	State Historic Preservation Office letter to Joe Horst, July 28, 2021
	Idaho Power	Kirk Ranzetta Rebuttal Testimony	Written testimony
	Idaho Power	Ranzetta Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Ranzetta Rebuttal Exhibit B	BLM – Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM Lands, 2013
	Idaho Power	Ranzetta Rebuttal Exhibit C	National Registration of Historic Places Registration Form for Oregon Trail: La Grande to Hilgard Segment

	Idaho Power	Ranzetta Rebuttal Exhibit D	Letter from Tetra Tech to John Williams
HCA-6	N/A	(no additional evidence offered)	
HCA-7	Williams	John Williams Testimony	Written testimony
	Idaho Power	Kirk Ranzetta Rebuttal Testimony	Written testimony
	Idaho Power	Ranzetta Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Ranzetta Rebuttal Exhibit B	BLM – Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM Lands, 2013
	Idaho Power	Ranzetta Rebuttal Exhibit C	National Registration of Historic Places Registration Form for Oregon Trail: La Grande to Hilgard Segment
	Idaho Power	Ranzetta Rebuttal Exhibit D	Letter from Tetra Tech to John Williams
	Williams	John Williams Surrebuttal Testimony	Written testimony (second bullet point excluded)
LU-4	N/A	(no additional evidence offered)	
LU-7	N/A	(no additional evidence offered)	
LU-8	N/A	(no additional evidence offered)	
LU-9	Myers	Sam Myers Direct Testimony	Written testimony
	Idaho Power	Kurtis Funke Rebuttal Testimony	Written testimony
	Idaho Power	Funke Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Funke Rebuttal Exhibit B	Article, Assessing the Accuracy and Integrity of PTK GPS Beneath High Voltage Power Line (2001)
	Idaho Power	Funke Rebuttal Exhibit C	Updated Table 5-7 from Idaho Power's Agricultural Lands Assessment (Sept. 2005)
	Idaho Power	Mark Madison Rebuttal Testimony	Written testimony
	Idaho Power	Madison Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Madison Rebuttal Exhibit M	USDA, Wildland Fire in Ecosystems
	Idaho Power	Madison Rebuttal Exhibit N	Benefits of Prescribed Burning (Aug. 2013)
	Idaho Power	Christopher Lautenberger Rebuttal Testimony	Written testimony
	Myers	Sam Myers Surrebuttal Testimony	Written testimony
	Idaho Power	Mark Madison Sur-surrebuttal Testimony	Written testimony
LU-11	Gilbert	Irene Gilbert Testimony	Written testimony
	Gilbert	Gilbert Exhibit 8	Article, A Weedy Scourge: 20 Invasive Plant Species That Cost Oregon Millions
	Gilbert	Gilbert Exhibit 11	ODOE Response to Gilbert Discovery Requests
	Gilbert	Gilbert Exhibit 18	Article, Crop Duster Strikes Arizona T-Line
	Idaho Power	Douglas Dockter Rebuttal Testimony	Written testimony
	Idaho Power	Dockter Exhibit A	Curriculum Vitae
	Idaho Power	Jessica Taylor Rebuttal Testimony	Written testimony

	Idaho Power	Taylor Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Taylor Rebuttal Exhibit B	Updated Draft Noxious Weed Plan, 11-12-21
	Idaho Power	Taylor Rebuttal Exhibit C	ODA – Noxious Weed Policy and Classification System 2020
	Idaho Power	Taylor Rebuttal Exhibit D	Union County Noxious Weed List - 2019
	Idaho Power	Taylor Rebuttal Exhibit E	ODFW – Oregon Conservation Strategy, Chapter 1: Overview
	Idaho Power	Kurtis Funke Rebuttal Testimony	Written testimony
	Idaho Power	Funke Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Funke Rebuttal Exhibit B	Article, Assessing the Accuracy and Integrity of PTK GPS Beneath High Voltage Power Line (2001)
	Idaho Power	Funke Rebuttal Exhibit C	Updated Table 5-7 from Idaho Power's Agricultural Lands Assessment (Sept. 2005)
		Mark Porter (ODA) Cross-Examination Hearing Testimony	Hearing Transcript – Day 7 (Jan. 21, 2022)
	Idaho Power	Transcript Corrections to Cross-Examination Hearing Days 4 and 7	Corrections to Hearing Transcript – Days 4 and 7
NC-1, NC-2, NC-3, and NC-4	Stop B2H	Fuji Kreider Direct Testimony Regarding Issue NC-1	Written testimony
	Stop B2H	Fuji Kreider Direct Testimony on Issue NC-2	Written testimony
	Stop B2H	Fuji Kreider Direct Testimony on Issue NC-3	Written testimony
	Stop B2H	Fuji Kreider Direct Testimony on Issue NC-4	Written testimony
	Stop B2H	Kerrie Standlee Direct Testimony Regarding Issues NC-2, NC-3 and NC-4	Written testimony
	Stop B2H	Stop B2H Exhibit 1	Fuji Kreider Declaration, with attachment
	Stop B2H	Stop B2H Exhibit 2	Lois Barry Declaration on NC-1, NC-2 and NC-4
	Stop B2H	Stop B2H Exhibit 3	Colburn letter to BLM, July 10, 2015
	Stop B2H	Stop B2H Exhibit 4	Jim Kreider Declaration on NC-2
	Stop B2H	Stop B2H Exhibit 5	Standlee Report, September 15, 2021
	Stop B2H	Stop B2H Exhibit 6	Email exchanges between ODOE and Fuji Kreider
	Stop B2H	Stop B2H Exhibit 10	Irene Gilbert Declaration on Issues NC-2 and NC-3
	Stop B2H	Stop B2H Exhibit 11	Ashley O'Toole Declaration on NC-3
	Stop B2H	Stop B2H Exhibit 12	Greg Larkin Declaration
	Gilbert	Irene Gilbert Testimony Regarding Issue NC-2	Written testimony
	Gilbert	Gilbert Exhibit 1	US Dept. of the Interior, Director's Order #47, Soundscape Preservation and Noise Management, December 1, 2000
	Gilbert	Gilbert Exhibit 7	Williams v. Invenergy LLC and Willow Creek Energy LLC, Complaint filed 8/9/13
	Gilbert	Gilbert Exhibits 14 - 17	Photographs of Larkin property

	Gilbert	Gilbert Exhibits 18 - 21	Photographs of MP 11 location
	Gilbert	Gilbert Exhibit 27	OHA, Strategic Health Impact Assessment on Wind Energy Development in Oregon, March 2013
	Horst	Joe Horst Direct Testimony	Regarding Issue NC-2
	Horst	Horst Exhibit Q	Gilbert and Kreider Discovery Requests to ODOE
	Myers	Sam Myers Direct Testimony	Regarding Issue NC-2
	ODOE	Ken Kosky, Golder Assoc. Rebuttal Testimony	Written testimony
	ODOE	Kosky Attachment 1	Resume, Kennard F. Kosky, PE
	ODOE	Kosky Attachment 2	Resume, Gage Miller
	ODOE	Kosky Attachment 3	Technical Memorandum, Review of Additional Baseline Data Collected in October 2021
	ODOE	Patrick Rowe Declaration	Written testimony explaining attachments
	ODOE	Rowe Attachment 1	Oregon DEQ Internal Management Directive re: Staff Guidance on Noise Control Issues
	ODOE	Rowe Attachment 2	Stop B2H Discovery Request to Oregon DEQ
	ODOE	Rowe Attachment 3	Oregon DEQ Response to Discovery Request
	ODOE	Rowe Attachment 4	A-Engrossed version of Oregon Senate Bill 951 (1995)
	ODOE	Rowe Attachment 5	Legislative History, SB 951 (1995)
	Idaho Power	Mark Bastasch Rebuttal Testimony	Written testimony
	Idaho Power	Bastasch Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Bastasch Rebuttal Exhibit B	Oregon DEQ, Staff Guidance on Noise Control Issues (July 2003)
	Idaho Power	Bastasch Rebuttal Exhibit C	Oregon DEQ, Sound Measurement Procedure Manual (Sept. 4, 1974)
	Idaho Power	Bastasch Rebuttal Exhibit D	Article, Sound Levels of Rain and of Wind in the Trees (Nov. – Dec. 1998)
	Idaho Power	Bastasch Rebuttal Exhibit E	Merriam-Webster Online Dictionary, Definition of “Infrequent”
	Idaho Power	Bastasch Rebuttal Exhibit F	BPA, I-5 Corridor Reinforcement Final EIS (Feb. 2016)
	Idaho Power	Bastasch Rebuttal Exhibit G	Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guidance (Dec. 2011)
	Idaho Power	Bastasch Rebuttal Exhibit H	Oregon DEQ, Adoption of Statewide Rules Related to Noise Pollution from Industrial and Commission Sources and Changes to the Sound Measurement Procedures Manuals, NPCS-1, 2 (Sept. 4, 1974)
	Idaho Power	Bastasch Rebuttal Exhibit I	Photo Log of Supplemental Monitoring Equipment Stations (October 10-11, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit J	Tabulated Hourly Data from Supplemental Monitoring (October 10, 2021-November 1, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit K	Extracted Sound Level Meter Files (October 10, 2021-November 1, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit L	Reanalysis of MP 11 Area (November 12, 2021)

	Idaho Power	Bastasch Rebuttal Exhibit M	BPA, Audible Noise Policy (October 2005)
	Idaho Power	Joseph Stippel Rebuttal Testimony Regarding Issues NC-1 and NC-2	Written testimony
	Idaho Power	Stippel Rebuttal Exhibit A	Oregon DEQ, Staff Guidance on Noise Control Issues (July 2003)
	Idaho Power	Lisa Rackner Declaration	Explaining attached exhibits regarding Noise Control Issues
	Idaho Power	Rackner Exhibit A	Email Correspondence between Stop B2H and Lisa Rackner
	Idaho Power	Rackner Exhibit B	Email Correspondence between Karl Juengling and Lisa Rackner
	STOP B2H	Fuji Kreider Surrebuttal Testimony	Regarding Issues NC-2, NC-3 and NC-4, with photographs embedded
	STOP B2H	Stop B2H Surrebuttal Exhibit A	Kerrie Standlee Review of Rebuttal Testimony
	STOP B2H	Stop B2H Surrebuttal Exhibit B	Supplemental Information Regarding Sound Monitoring Requests and Selection of Locations
	STOP B2H	Stop B2H Surrebuttal Exhibit C	Email Exchange between Jim Kreider and City of La Grande Officials (Nov. 30 – Dec. 1, 2021)
	STOP B2H	Stop B2H Surrebuttal Exhibit D	Video of Supplemental Monitoring Position MP 103
	STOP B2H	Stop B2H Cross-Examination Exhibit 1	Sound Level and Wind Speed Data graphs
	STOP B2H	Stop B2H Cross-Examination Exhibit 2	Measurement notes
	Idaho Power	Bastasch Sur-surrebuttal Exhibit A	MP 102 Analysis for October 15-16, 2021
	Idaho Power	Bastasch Sur-surrebuttal Exhibit B	Reanalysis of MP 11 Area – Morgan Lake Alternative
	Idaho Power	Bastasch Sur-surrebuttal Exhibit C	Reanalysis of MP 11 Area – Proposed Mill Creek Route – Map 1
	Idaho Power	Bastasch Sur-surrebuttal Exhibit D	Reanalysis of MP 11 Area – Proposed Mill Creek Route – Map 2
	Idaho Power	Bastasch Sur-surrebuttal Exhibit E	Statistical Distribution of October Windspeeds (2008-2021, La Grande National Weather Service Station)
	Idaho Power	Bastasch Sur-surrebuttal Exhibit F	Email Exchange between Lisa Rackner and Karl Anuta regarding equipment calibration
	Idaho Power	Bastasch Sur-surrebuttal Exhibit G	Annual Laboratory Calibration Records
	Idaho Power	Bastasch Sur-surrebuttal Exhibit H	Post-monitoring Field Calibration information
	Idaho Power	Bastasch Sur-surrebuttal Exhibit I	Corrected Tables 1 and 2 of Bastasch Rebuttal Testimony
	Idaho Power	Bastasch Sur-surrebuttal Exhibit J	Declaration of Rodrigo Gonzalez-Abraham regarding Noise Control Issues
		Mark Bastasch Cross-Examination Hearing Testimony	Hearing Transcript – Day 1 (Jan. 10, 2022)
		Gage Miller Cross-Examination Hearing Testimony	Hearing Transcript – Day 1 (Jan. 10, 2022)
		Kerri Standlee Cross-Examination Hearing Testimony	Hearing Transcript – Day 1 (Jan. 10, 2022)
	Idaho Power	Idaho Power Corrections to Cross-Exam Hearing Transcript Day 1	Corrections to Hearing Transcript Day 1

	ODOE	ODOE Corrections to Cross-Examination Hearing Day 1	Corrections to Hearing Transcript Day 1
	STOP B2H	STOP B2H Corrections to January 10, 2022 Hearing Transcript	Corrections to Hearing Transcript Day 1
NC-6	Gray	Dianne B. Gray Direct Testimony	Written testimony
	ODOE	Ken Kosky, Golder Assoc. Rebuttal Testimony	Written testimony
	ODOE	Kosky Attachment 1	Resume, Kennard F. Kosky, PE
	ODOE	Kosky Attachment 2	Resume, Gage Miller
	ODOE	Kosky Attachment 3	Technical Memorandum, Review of Additional Baseline Data Collected in October 2021
	Idaho Power	Mark Bastasch Rebuttal Testimony	Written testimony
	Idaho Power	Bastasch Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Bastasch Rebuttal Exhibit B	Oregon DEQ, Staff Guidance on Noise Control Issues (July 2003)
	Idaho Power	Bastasch Rebuttal Exhibit C	Oregon DEQ, Sound Measurement Procedure Manual (Sept. 4, 1974)
	Idaho Power	Bastasch Rebuttal Exhibit D	Article, Sound Levels of Rain and of Wind in the Trees (Nov. – Dec. 1998)
	Idaho Power	Bastasch Rebuttal Exhibit E	Merriam-Webster Online Dictionary, Definition of “Infrequent”
	Idaho Power	Bastasch Rebuttal Exhibit F	BPA, I-5 Corridor Reinforcement Final EIS (Feb. 2016)
	Idaho Power	Bastasch Rebuttal Exhibit G	Federal Highway Administration, Highway Traffic Noise: Analysis and Abatement Guidance (Dec. 2011)
	Idaho Power	Bastasch Rebuttal Exhibit H	Oregon DEQ, Adoption of Statewide Rules Related to Noise Pollution from Industrial and Commission Sources and Changes to the Sound Measurement Procedures Manuals, NPC-1, 2 (Sept. 4, 1974)
	Idaho Power	Bastasch Rebuttal Exhibit I	Photo Log of Supplemental Monitoring Equipment Stations (October 10-11, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit J	Tabulated Hourly Data from Supplemental Monitoring (October 10, 2021-November 1, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit K	Extracted Sound Level Meter Files (October 10, 2021-November 1, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit L	Reanalysis of MP 11 Area (November 12, 2021)
	Idaho Power	Bastasch Rebuttal Exhibit M	BPA, Audible Noise Policy (October 2005)
	Idaho Power	Joseph Stippel Rebuttal Testimony	Regarding Issues NC-1 and NC-2
	Idaho Power	Stippel Rebuttal Exhibit A	Oregon DEQ, Staff Guidance on Noise Control Issues (July 2003)
	Idaho Power	Lisa Rackner Declaration	Explaining attached exhibits regarding Noise Control Issues
	Idaho Power	Rackner Exhibit A	Email Correspondence between Stop B2H and Lisa Rackner
	Idaho Power	Rackner Exhibit B	Email Correspondence between Karl Juengling and Lisa Rackner
PS-1	N/A	(no additional evidence offered)	

PS-2 and PS-3	Carbiener/OCTA	Gail Carbiener Direct Testimony Regarding Issues PS-2 and PS-3	Written testimony
	Idaho Power	Christopher Lautenberger Rebuttal Testimony	Written testimony
	Idaho Power	Lautenberger Rebuttal Exhibit A	Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model, USDA, General Technical Report RMRS-GTR-153 (June 2005)
	Idaho Power	Lautenberger Rebuttal Exhibit B	Data from LANDFIRE (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit C	How to Generate and Interpret Fire Characteristics Charts for Surface and Crown Fire Behavior, USDA, General Technical Report RMRS-GTR-253 (Mar. 2011)
	Idaho Power	Lautenberger Rebuttal Exhibit D	Data from Fire Occurrence Database (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit E	Data from Mesowest (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit F	Article: Power Lines and Catastrophic Wildland Fire in Southern California (2009)
	Idaho Power	Lautenberger Rebuttal Exhibit G	NWS Text Products by Issuing Center by Date, Iowa Environmental Mesonet, Iowa State University (Mar. 18, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit H	USDA and Department of the Interior, "Urban Wildland Interface Communities Within the Vicinity of Federal Lands that Are at High Risk from Wildfire," Fed. Reg., 66: 753 (2001)
	Idaho Power	Lautenberger Rebuttal Exhibit I	Data from SILVIS Labs (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit J	Exhibit J, Data from Wildland Fire Decision Support System (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit K	Butte County District Attorney's Office, The Camp Fire Public Report: A Summary of the Camp Fire Investigation (June 16, 2020)
	Idaho Power	Lautenberger Rebuttal Exhibit L	Article: NBC Bay Area, PG&E Criminally Charged for Kincade Fire (Apr. 6, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit M	Article: PacifiCorp Agrees to Pay 3.4 Million for 2018 Ramsey Canyon Fire Near Sams Valley, KDRV (June 10, 2020)
	Idaho Power	Lautenberger Rebuttal Exhibit N	PG&E Fire Incident Data 2020
	Idaho Power	Lautenberger Rebuttal Exhibit O	Pacific Northwest Wildfire Coordinating Group, 2020 Northwest Area Fire Weather Annual Operating Plan" (July 1, 2020)
	Idaho Power	Lautenberger Rebuttal Exhibit P	Archived NWS Watch, Warnings, Advisories Iowa Environmental Mesonet (filed Nov. 12, 2021)
	Idaho Power	Lautenberger Rebuttal Exhibit Q	Executive Order No. 19-01 (Jan. 30, 2019)
	Idaho Power	Lautenberger Rebuttal Exhibit R	EFSC Staff Report, Agenda Item G (Action Item): Update on PUC Wildfire Mitigation Rulemaking and Initiation of Council Rulemaking for the October 22, 2021, EFSC Meeting (Oct. 8, 2021)

	Idaho Power	Lautenberger Rebuttal Exhibit S	Article: Fire Induced Flashovers of Transmission Lines: Theoretical Models, Institute of Electrical and Electronics Engineers, Africon (2002)
	Idaho Power	Lautenberger Rebuttal Exhibit T	“The 10% Wind Speed Rule of Thumb for Estimating a Wildfire’s Forward Rate of Spread in Forests and Shrublands,” Annals of Forest Science 76: 44 (2019)
	Idaho Power	Lautenberger Rebuttal Exhibit U	Oregon Natural Hazards Mitigation Plan (Sept. 24, 2020)
	Idaho Power	Lautenberger Rebuttal Exhibit V	Article: Using Expert Judgment to Model Initial Attack Fire Crew Effectiveness, Forest Science 44.4 (1998)
PS-4	Cooper	Matthew Cooper Direct Testimony	Written testimony
	Cooper	Lois Barry Direct Testimony	Written testimony
	Cooper	Corinne Dutto Direct Testimony	Written testimony
	Cooper	Joann Harris Direct Testimony	Written testimony
	Cooper	Jim Kreider Direct Testimony	Written testimony
	Cooper	Cooper Exhibit 1	Photograph
	Cooper	Cooper Exhibit 2	La Grande Observer articles on the Rooster Peak Fire (August 1973)
	Cooper	Cooper Exhibit 3	La Grande Observer article: “Recalling the Fire of August 1973” (August 18, 2003)
	Cooper	Cooper Exhibit 4	Union County Community Wildfire Protection Plan (2005)
	Cooper	Cooper Exhibit 5	Union County Community Wildfire Protection Plan (2016)
	Cooper	Cooper Exhibit 6	Deposition of Craig Kretschmer (May 13, 2021)
	Cooper	Cooper Exhibit 7	City of La Grande response to PRR on fire truck travel times to Morgan Lake Road
	Cooper	Cooper Exhibit 8	Table of fire truck travel time to Morgan Lake Road area
	Cooper	Cooper Exhibit 9	Wildfire Risk by County, Oregon Forestland-Urban Interface Fire Protection Act
	Cooper	Cooper Exhibit 17	NE Oregon Regional Natural Hazards Mitigation Plan (2014)
	Cooper	Cooper Exhibit 21	Article: Southern California Edison says its equipment may have caused Orange County fire
	Cooper	Cooper Exhibit 22	Baker City Herald article, Missing Mountains (Aug. 1, 2020)
	Cooper	Cooper Exhibit 23	Oregonian article: PacifiCorp could face substantial liability if downed power lines caused Oregon wildfires (Oct. 7, 2020)
	Cooper	Cooper Exhibit 24	Blue Mountain Times article (Aug. 22, 1868)
	Cooper	Cooper Exhibit 25	Tax Map of SW La Grande
	Idaho Power	Douglas Dockter Rebuttal Testimony	Written testimony
	Idaho Power	Dockter Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Dennis Johnson Rebuttal Testimony	Written testimony
	Idaho Power	Johnson Rebuttal Exhibit A	Curriculum Vitae

	Idaho Power	Johnson Rebuttal Exhibit B	Class 4 Cost Estimate Report for an Underground Installation Within the Viewshed of the NHOTIC
	Idaho Power	Johnson Rebuttal Exhibit C	Southern California Edison Company application concerning the Tehachapi Renewable Transmission Project (Segments 4 through 11) (Jan. 18, 2017)
	Idaho Power	Christopher Lautenberger Rebuttal Testimony	Written testimony
	Idaho Power	Lautenberger Rebuttal Exhibits A through V	(See descriptions for Lautenberger Rebuttal Exhibits A through V set out above with Issues PS-2 and PS-3)
	Cooper	Matt Cooper Surrebuttal to Christopher Lautenberger's Rebuttal Testimony	Written testimony
	Cooper	Matt Cooper Surrebuttal to Douglas Dockter's Rebuttal Testimony	Written testimony
	Cooper	Cooper Surrebuttal Exhibit A	USGS Topological Map, La Grande Quadrangle (2017)
	Cooper	Cooper Surrebuttal Exhibit B	Topo Graph and interval contour lines
	Cooper	Cooper Surrebuttal Exhibit C	Mountaineering: Freedom of the Hills (1997)
	Idaho Power	Dockter Sur-surrebuttal Exhibit A	Cooper response to discovery request, email thread
	Idaho Power	Dockter Sur-surrebuttal Exhibit B	Idaho Power Wildfire Mitigation Plan 2022 (Dec. 2021)
	Idaho Power	Dockter Sur-surrebuttal Exhibit C	Map of La Grande Area Fire Response Agencies
	Idaho Power	Dockter Sur-surrebuttal Exhibit D	Blue Mountain Interagency Fire Center Annual Report (2020)
		Douglas Dockter Cross-Examination Hearing Testimony	Hearing Transcript – Day 3 (Jan. 13, 2022)
		Christopher Lautenberger Cross-Examination Hearing Testimony	Hearing Transcript – Day 3 (Jan. 13, 2022)
	Cooper	Cooper Transcript Corrections to Hearing Transcript Day 3	Corrections to Hearing Transcript – Day 3
	Idaho Power	Idaho Power Transcript Corrections to Hearing Transcript Day 3	Corrections to Hearing Transcript – Day 3
	PS-5	N/A	(no additional evidence offered)
	PS-6	Mammen	Dale and Virginia Mammen Direct Testimony on Issue PS-6
		Mammen	Mammen Exhibit 1
		Mammen	Mammen Exhibit 2
		Mammen	Mammen Exhibit 3
		Mammen	Mammen Exhibit 4
		Mammen	Mammen Exhibit 6
		Mammen	Mammen Exhibit 7

			Declaration of Chris and Erin Stauffer
	Horst/Cavinato	Joe Horst Direct Testimony	Written testimony
	Horst/Cavinato	Horst Exhibits A-1, A-2 and A-3	Maps showing Hawthorne Drive location
	Horst/Cavinato	Horst Exhibit B	Arial photo of Hawthorne Drive
	Horst/Cavinato	Horst Exhibit C	Arial photo of Hawthorne Drive/Oregon Trail route
	Horst/Cavinato	Horst Exhibit D	Arial photo showing new development near Hawthorne Drive
	Horst/Cavinato	Horst Exhibit E-1 and E-2	Arial photo and ground level photo of Hawthorne Drive/Modelaire Loop
	Horst/Cavinato	Horst Exhibit E-2	Affidavit of Luke Grebe regarding Idaho Power's MSD on Issue SS-4
	Horst/Cavinato	Horst Exhibit F	Arial photo of Hawthorne Drive and creek
	Horst/Cavinato	Horst Exhibits G-1 and G-2	Arial photo and ground level photo of city boundary
	Horst/Cavinato	Horst Exhibit I	Letter re Oregon Trail, La Grande to Hilgard Segment (July 28, 2021)
	Horst/Cavinato	Horst Exhibit J-1 and J-2	Photos showing Hawthorne Drive width
	Horst/Cavinato	Horst Exhibit L	Excerpt from B2H Transportation and Traffic Plan
	Horst/Cavinato	Horst Exhibit M-1 and M-2	Photographs showing home, person on Hawthorne Dr.
	Horst/Cavinato	Horst Exhibit O	City of La Grande's Compliance Review of B2H ASC (Oct. 8, 2018)
	Horst/Cavinato	Horst Exhibit P	Excerpt Idaho Power's MSD Response on Issue SS-4
	Horst/Cavinato	Horst Exhibit R	Update Letter re Mill Creek Route (March 24, 2020)
	Idaho Power	Luke Grebe Rebuttal Testimony	Written testimony
	Idaho Power	Grebe Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Grebe Rebuttal Exhibit B	Access Road Field Review (August 18, 2021)
	Idaho Power	Grebe Rebuttal Exhibit C	ODOT, Transportation System Planning Guidelines (2008)
	Idaho Power	Grebe Rebuttal Exhibit D	BPA, Transmission Line Access Road Geometrics Design SDT-DT-000101 (Nov. 6, 2017)
	Idaho Power	Grebe Rebuttal Exhibit E	PAC, TA 501 Roads – Construction (April 7, 2008)
	Idaho Power	Grebe Rebuttal Exhibit F	Federal Highway Administration, Manual of Uniform Traffic Control Devices (Dec. 2009)
PS-8 and PS-9	Idaho Power	Declaration of Douglas J. Dockter	Written testimony
	Idaho Power	Dockter Exhibit A	Idaho Power's 2021 Wildfire Mitigation Plan
	Idaho Power	Dockter Exhibit B	In re Rulemaking for Risk-based Wildfire Protection Plans and Planned Activities Consistent with Executive Order 20-04, OPUC Docket AR 638, Docket Strategy Change Announcement (July 28, 2021)
	Idaho Power	Dockter Exhibit C	In re Wildfire Mitigation Rulemaking – Phase 1, OPUC Docket AR 648, Staff's UPDATED AR 648 Draft Phase I Wildfire

			Mitigation Rules (Aug. 20, 2021)
	Idaho Power	Dockter Exhibit D	OPUC Docket AR 648, Notice of Proposed Rulemaking (Sept. 14, 2021)
	Idaho Power	Dockter Exhibit E	In re Risk-Based Wildfire Protection Plans and Planned Activities Consistent with Executive Order 20-04, OPUC Docket AR 638, Order No. 21-167 (May 27, 2021)
	Idaho Power	Dockter Exhibit F	In re Idaho Power Company Application for Waiver of OAR 860-024-0050 and OAR 860-024-0060 through OAR 860-024-0160 Wildfire Rules, OPUC Docket UM 2179, Order No. 21-269 (Aug. 26, 2021)
	Idaho Power	Dockter Exhibit G	In re Application of Idaho Power Company for an Accounting Order Authorizing the Deferral of Incremental Wildfire Mitigation and Insurance Costs, IPUC Case No. IPC-E-21-02, Order No. 35077 (June 17, 2021)
	Idaho Power	Christopher W. Lautenberger Direct Testimony	Written testimony
	Idaho Power	Lautenberger Exhibit A	Curriculum Vitae
	Idaho Power	Lautenberger Exhibit B	Application of San Diego Gas & Electric Company (U 902 E) for the Sunrise Powerlink Transmission Project, A.06-08-010, D.08-12-058 (Dec. 18, 2008)
	Idaho Power	Lautenberger Exhibit C	Application of San Diego Gas & Electric Company (U 902 E) for the Sunrise Powerlink Transmission Project, A.06-08-010, D.08-12-058, Appendix C (Dec. 24, 2008)
	Idaho Power	Lautenberger Exhibit D	Snow Fire Incident Information Fact Sheet (June 5, 2015)
	Idaho Power	Lautenberger Exhibit E	U.S. Attorney's Office, Dist. of Or., PacifiCorp to Pay \$3.4 Million in Civil Settlement for Ramsey Canyon Fire (June 9, 2020)
	Idaho Power	Lautenberger Exhibit F	Pacific Gas and Electric Fire Incident Report Data Compiled from 2014-2019
	Idaho Power	Lautenberger Exhibit G	Southern California Edison Fire Incident Report Data Compiled from 2014-2019
	Idaho Power	Lautenberger Exhibit H	San Diego Gas and Electric Fire Incident Report Data Compiled from 2014-2019
	Idaho Power	Lautenberger Exhibit I	Data from Department of Homeland Security Homeland Infrastructure Foundation-Level Data Regarding Transmission and Subtransmission Lines in the United States
PS-10	Lyons	Charles Lyons Direct Testimony	Written testimony
	Lyons	Lyons Exhibit 2a	Excerpt from Union County Wildfire Protection Plan, Chapter 6 (June 30, 2016)
	Lyons	Lyons Exhibit 2b	Union County Wildfire Protection Plan Appendix E Scoring Criteria 2016 Pages 1-5
	Lyons	Lyons Exhibit 2c	Union County Community Wildfire Protection Plan 8-10-05 Table 6 Pages 36-37
	Lyons	Lyons Exhibit 3	Idaho Power Response to Lyons Discovery

			Requests
	Lyons	Lyons Exhibit 4	Article Oregon's Emergency Responders and Utilities are Oregonian 6/4/2021
	Lyons	Lyons Exhibit 5	Oregonian Article: "Utility had plan in place, but didn't" (March 28, 2021)
	Webster	Stacia Webster Direct Testimony	Written testimony
	Webster	Lois Barry Testimony on Issue PS-10	Written testimony
	Webster	Webster Exhibit 3	Photograph
	Webster	Webster Exhibit 4	Photograph
	Webster	Webster Exhibit 5	Response times from LGRFPD to Morgan Lake Road
	Webster	Webster Exhibit 6	Deposition of Craig Kretschmer (May 13, 2021)
	Webster	Webster Exhibit 7	Adrian Fire Survey
	Webster	Webster Exhibit 8	Echo Fire Survey, page 1
	Webster	Webster Exhibit 9	Echo Fire Survey, page 2
	Webster	Webster Exhibit 11	Pilot Rock Fire Survey
	Webster	Webster Exhibit 12	Umatilla County Fire Survey, page 1
	Webster	Webster Exhibit 13	Umatilla County Fire Survey, page 2
	Webster	Webster Exhibits 14-16	La Grande Observer articles - Rooster Peak Fire (Aug. 1973)
	Webster	Webster Exhibits 17-19	La Grande Observer articles - Rooster Peak Fire (Aug. 1973)
	Webster	Webster Exhibits 20-24	La Grande Observer articles - Rooster Peak Fire (Aug. 1973)
	Webster	Webster Exhibit 27	Article: Evaluating 10% Wind Speed Rule of Thumb
	Webster	Webster Exhibit 28	Article on So Cal Edison and Orange County fires
	Idaho Power	Robert A. Cummings Rebuttal Testimony	Written testimony
	Idaho Power	Cummings Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Cummings Rebuttal Exhibit B	Video – Blasting (June 24, 2021)
	Idaho Power	Cummings Rebuttal Exhibit C	Survey of Blasting Effects on Ground Water Supplies in Appalachia, Volume 1 (1980)
	Idaho Power	Cummings Rebuttal Exhibit D	Impacts of Blasting on Domestic Water Wells (2000)
	Idaho Power	Cummings Rebuttal Exhibit E	Blasting Effects on Appalachian Water Wells (April 15, 1987)
	Idaho Power	Cummings Rebuttal Exhibit F	Blast Vibration Damage to Water Supply Well Water Quality and Quantity (1997)
	Idaho Power	Cummings Rebuttal Exhibit G	Idaho Power Company Wildfire Mitigation Plan (June 2021)
	Idaho Power	Douglas Dockter Rebuttal Testimony	Written testimony
	Idaho Power	Dockter Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Dennis Johnson Rebuttal Testimony	Written testimony
	Idaho Power	Johnson Rebuttal Exhibits A through C	(See descriptions for Johnson Rebuttal Exhibits A through C set out above with Issue PS-4)
	Idaho Power	Christopher Lautenberger Rebuttal Testimony	Written testimony

	Idaho Power	Lautenberger Rebuttal Exhibits A through V	(See descriptions for Lautenberger Rebuttal Exhibits A through V set out above with Issues PS-2 and PS-3)
R-1, R-2, R-3, and R-4	C. Andrew	Colin Andrew Direct Testimony on Issue R-1	Written testimony
	Andrew/McAllister/Barry	Cynthia Carper Direct Testimony on Issues R-1 and R-2	Written testimony
	Andrew/McAllister/Barry	Levi Edvalson Direct Testimony on Issues R-1 and R-2	Written testimony
	Andrew/McAllister/Barry	Eric Griffith Direct Testimony Issues R-1 and R-2	Written testimony
	Andrew/McAllister/Barry	Christopher Jones Direct Testimony on Issues R-1 and R-2	Written testimony
	Andrew/McAllister/Barry	Michael McAllister Direct Testimony on Issues R-1 and R-2	Written testimony
	Andrew/McAllister/Barry	Kyann Sholtes Direct Testimony	Written testimony
	Andrew/McAllister/Barry	Geoffrey Witek Direct Testimony	Written testimony
	McAllister	McAllister Exhibit 1	City of La Grande Comments on the Amended Preliminary ASC (August 31, 2017)
	McAllister	McAllister Exhibit 2	Idaho Power Responses to City of La Grande Comments on the Amended Preliminary ASC (August 27, 2018)
	McAllister	McAllister Exhibit 3	City of La Grande Proclamation - Declaring and Clarifying Opposition to the Boardman to Hemingway Powerline Project (2019)
	McAllister	McAllister Exhibit 4	Morgan Lake Park Recreational Use and Development Plan
	McAllister	McAllister Exhibit 5	McAllister's Opposition to Idaho Power's MSD on Issue R-2
	McAllister	McAllister Exhibit 6	Photographs of Morgan Lake Park/Twin Lakes Wetland
	L. Barry	Lois Barry Testimony on Issue R-2	Written testimony
	L. Barry	Lois Barry Testimony on Issue R-3	Written testimony
	P. Barry	Peter Barry Testimony on Issue R-3	Written testimony
	L. Barry	Steve Antell Testimony on Issue R-3	Written testimony
	L. Barry	Susan Badger-Jones Testimony on Issue R-3	Written testimony
	L. Barry	Michael S. Daugherty Testimony on Issue R-3	Written testimony
	L. Barry	Jim Kreider Testimony on Issues R-2 and R-3	Written testimony
	L. Barry	Jennifer Williams Testimony on Issue R-3	Written testimony
	L. Barry	Barry Exhibit 6, Issue R-3	Visual Assessment Work Group Minutes

L. Barry	Barry Exhibit 10, Issue R-3	Excerpt from Landscape Aesthetics: A Handbook for Scenery Management USFS SMS (1995)
L. Barry	Barry Exhibit 16, Issue R-3	Article: From Overhead to Underground: It Pays to Bury Power Lines
L. Barry	Barry Exhibit 17, Issue R-3	Article: PG&E to Bury Transmission Lines at Cost of \$2 Million per Mile (Aug. 21, 2021)
L. Barry	Barry Exhibit 19, Issue R-3	Article: Burying High Voltage and Benefits of Burying Lines, RETA
L. Barry	Lois Barry Testimony on Issue R-4	Written testimony
L. Barry	Barry Exhibit 22	Photos of undeveloped areas of Morgan Lake Park
Idaho Power	Joseph Stippel Declaration	Written testimony
Idaho Power	Stippel Exhibit A	Morgan Lake Lattice vs. H-Frame (Nov. 11, 2021)
Idaho Power	Stippel Exhibit B	NHOTIC Lattice vs. H-Frame (Nov. 11, 2021)
Idaho Power	Dennis Johnson Rebuttal Testimony on Issue R-3	Written testimony
Idaho Power	Johnson Rebuttal Exhibit A	Curriculum Vitae
Idaho Power	Johnson Rebuttal Exhibit B	Class 4 Cost Estimate Report for an Underground Installation Within the Viewshed of the NHOTIC
Idaho Power	Johnson Rebuttal Exhibit C	Southern California Edison Company application concerning the Tehachapi Renewable Transmission Project (Segments 4 through 11) (Jan. 18, 2017)
Idaho Power	Louise Kling Rebuttal Testimony	Written testimony
Idaho Power	Kling Rebuttal Exhibit A	Curriculum Vitae
Idaho Power	Kling Rebuttal Exhibit B	Electric Transmission Visibility and Visual Contrast Threshold Distances in Western Landscapes (Apr. 2014)
Idaho Power	Kling Rebuttal Exhibit C	BLM Manual H-8410-1, Visual Resource Inventory (Jan. 17, 1986)
Idaho Power	Kling Rebuttal Exhibit D	Photosimulation of Project Components Near NHOTIC (filed Nov. 12, 2021)
Idaho Power	Kling Rebuttal Exhibit E	Revised Morgan Lake Park Supplemental Analysis (Nov. 12, 2021)
Idaho Power	Kling Rebuttal Exhibits F1, F2 and F3	Videos: Simulation of Potential Visual Impacts to Morgan Lake Park
Idaho Power	Kling Rebuttal Exhibit G	Tree Heights and Locations at Morgan Lake Park
Idaho Power	Kling Rebuttal Exhibit H	BLM, Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands (2013)
Idaho Power	Kling Rebuttal Exhibit I	NHOTIC Supplemental Analysis
Idaho Power	Kling Rebuttal Exhibits J1, J2, J3, and J4	Videos: Simulation of Potential Visual Impacts to the NHOTIC
L. Barry	Barry Cross-Examination Exhibit 4	Article: Changes and Challenges in USDA Forest Service Scenic Resource Management Under the 2012 Forest Planning Rule
L. Barry	Barry Cross-Examination Exhibits	B2H Visual Resources Workgroup Meeting

		1 and 2	Minutes (July 27, 2011)
		Dennis Johnson Cross-Examination Hearing Testimony	Hearing Transcript – Day 6 (January 19, 2022)
		Louise Kling Cross-Examination Hearing Testimony	Hearing Transcript – Day 6 (January 19, 2022)
	L. Barry	Barry Corrections to Hearing Transcript Day 6	Corrections to Hearing Transcript Day 6
	Idaho Power	Idaho Power Corrections to Hearing Transcript Day 6	Corrections to Hearing Transcript Day 6
RFA-1 and RFA-2	Carbiener	Gail Carbiener Direct Testimony on Issue RFA-1	Written testimony
	Carbiener	Gail Carbiener Direct Testimony on Issue RFA-2	Written testimony
	Gilbert	Irene Gilbert Opening Arguments Regarding Issue RFA-1	(Legal brief, not direct testimony)
	Gilbert	Gilbert Exhibit 1	Memo to EFSC from Christopher M. Clark, Siting Policy Analyst & Rules Coordinator, Surety Bond Template Update (August 13, 2021)
	Gilbert	Gilbert Exhibit 2	Memo to EFSC from Sarah Esterson, Senior Policy Advisor, Overview of the Energy Facility Siting Process Retirement and Financial Assurance Standard (August 13, 2021)
	Gilbert	Gilbert Exhibit 4	EFSC Meeting Minutes (January 23-24, 2020)
	Gilbert	Gilbert Exhibit 7	Excerpt from Bakeoven Final Order
	Gilbert	Gilbert Exhibit 9	Docket No. LC 74 for the 2019 Integrated Resource Plan staff report for the Oregon Public Utilities Commission (March 5, 2021)
	Gilbert	Gilbert Exhibit 11	WECC RPCG 2026 Common Case Transmission Assumptions Report (June 30, 2016)
	Gilbert	Gilbert Exhibit 12	Idaho Power's 2019 10K and 10Q Securities and Exchange Commission reports
	Gilbert	Gilbert Exhibit 15	Report of the Independent Consultants on the Greenhat Default (March 26, 2019)
	Idaho Power	Jared Ellsworth Rebuttal Testimony	Written testimony
	Idaho Power	Ellsworth Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Ellsworth Rebuttal Exhibit B	Idaho Power Company's Second Amended 2019 Integrated Resource Plan (Oct. 2020)
	Idaho Power	Ellsworth Rebuttal Exhibit C	Transmission Emerging as Major Stumbling Block for State Renewable Targets (Jan. 15, 2020)
	Idaho Power	Ellsworth Rebuttal Exhibit D	American Wind Energy Association, Grid Vision: The Electric Highway to a 21st Century Economy (May 2019)
	Idaho Power	Ellsworth Rebuttal Exhibit E	Department of Energy, Obama Administration Announces Job-Creating Grid Modernization Pilot Projects (Oct. 5, 2011)
	Idaho Power	Ellsworth Rebuttal Exhibit F	FERC Begins Reform Process to Build the Transmission System of the Future (July 15,

			2021)
	Idaho Power	Ellsworth Rebuttal Exhibit G	Idaho Power Company, 2019 Integrated Resource Plan, OPUC Docket LC 74, Order No. 21-184 (June 4, 2021)
	Idaho Power	Ellsworth Rebuttal Exhibit H	EFSC Meeting Minutes (January 23-24, 2020)
	Idaho Power	Ellsworth Rebuttal Exhibit I	National Renewable Energy Laboratory, The North American Renewable Integration Study: A U.S. Perspective (June 2021)
	Idaho Power	Ellsworth Rebuttal Exhibit J	Enrolled Senate Bill 589 (May 21, 2021)
	Idaho Power	Randy Mills Rebuttal Testimony	Written testimony
	Idaho Power	Mills Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Mills Rebuttal Exhibit B	Updated Letter of Willingness from Wells Fargo (Oct. 12, 2021)
	Idaho Power	Mills Rebuttal Exhibit C	EFSC 2021 Pre-approved List of Financial Institutions (Jan. 22, 2021)
	Idaho Power	Mills Rebuttal Exhibit D	Bakeoven Solar Project – Exhibit W Facility Retirement and Site Restoration (Nov. 2019)
	Idaho Power	Mills Rebuttal Exhibit E	Review of Bakeoven Solar Project, Exhibit W (Nov. 5, 2019)
	Idaho Power	Mills Rebuttal Exhibit F	Bakeoven Solar Project – Final Order on Application for Site Certificate (April 24, 2020)
	Idaho Power	Mills Rebuttal Exhibit G	Obsidian Solar Center – Proposed Order on Application for Site Certificate (Oct. 9, 2020)
	Idaho Power	Mills Rebuttal Exhibit H	IDACORP Annual Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 (Dec. 11, 2020)
	Idaho Power	Mills Rebuttal Exhibit I	<i>In re Pacific Gas and Electric Corp and Pacific Gas Electric Co.</i> , Case No. 19-30088 (May 28, 2020)
	Idaho Power	Mills Rebuttal Exhibit J	Order to Show Cause and Notice of Proposed Penalty (May 20, 2021)
	Idaho Power	Mills Rebuttal Exhibit K	Federal Register Vol. 79, No. 141 (July 23, 2014)
SR-2, SR-3, and SR-7	Carbiener	Gail Carbiener Direct Testimony on Issue SR-2	Written testimony
	Carbiener	John Briggs Direct Testimony on Issue SR-2	Written testimony
	Carbiener	Isobel Lingenfelter Direct Testimony on Issue SR-2	Written testimony
	Carbiener	Lingenfelter Exhibits 1 through 35	3D model of NIIOTIC and surrounding area, with videos and still shots
	Carbiener	Lingenfelter Exhibit 36	BLM Visual Resource Management Classes and Objectives
	Carbiener	Lingenfelter Exhibit 37	BLM Visual Resources Clearinghouse website
	Deschner	Whit Deschner Direct Testimony - Issue SR-3	Witness testimony (with embedded photographs and images)
	Deschner	George Venn statement	Written statement
	Deschner	Zea Young statement	Written statement

	STOP B2H	Lois Barry Direct Testimony	Written testimony
	Idaho Power	Dennis Johnson Rebuttal Testimony on Issue SR-2	Written testimony
	Idaho Power	Johnson Rebuttal Exhibits A through C	(See descriptions for Johnson Rebuttal Exhibits A through C set out above with Issue PS-4)
	Idaho Power	Louise Kling Rebuttal Testimony	Written testimony
	Idaho Power	Louise Kling Rebuttal Exhibits A through J	(See descriptions for Kling Rebuttal Exhibits A through J set out above with Issues R-1, R-2, R-3 and R-4)
	Idaho Power	Joseph Stippel Declaration	Written testimony
	Idaho Power	Stippel Rebuttal Exhibits A and B	(See descriptions for Stippel Rebuttal Exhibits A and B set out above with Issues R-1, R-2, R-3 and R-4)
		Dennis Johnson Cross-Examination Hearing Testimony	Hearing Transcript – Day 6 (January 19, 2022)
		Louise Kling Cross-Examination Hearing Testimony	Hearing Transcript – Day 6 (January 19, 2022)
		Isobel Lingenfelter Cross-Examination Hearing Testimony	Hearing Transcript – Day 6 (January 19, 2022)
	Idaho Power	Idaho Power Transcript Corrections to Cross-Examination Hearing Day 6	Corrections to Hearing Transcript – Day 6 (January 19, 2022)
	STOP B2H	STOP B2H's Corrections to Cross-Examination Hearing Transcript, January 19, 2022	Corrections to Hearing Transcript – Day 6 (January 19, 2022)
SP-1	Fouty/STOP B2H	Suzanne Fouty Direct Testimony on Issue SP-1	Written testimony
	Idaho Power	Mark Madison Rebuttal Testimony	Written testimony
	Idaho Power	Madison Rebuttal Exhibit A	Curriculum Vitae of Mark Madison
	Idaho Power	Madison Rebuttal Exhibit B	Curriculum Vitae of Denny Mengel
	Idaho Power	Madison Rebuttal Exhibit C	Curriculum Vitae of Guerry Holm
	Idaho Power	Madison Rebuttal Exhibit D	Updated Table 1-2-1
	Idaho Power	Madison Rebuttal Exhibit E	U.S. Dept. of Agriculture, Land-Capability Classification (Sept. 1961)
	Idaho Power	Madison Rebuttal Exhibit F	Madras Solar Energy Facility - Final Order on Application for Site Certificate (June 25, 2021)
	Idaho Power	Madison Rebuttal Exhibit G	Northwest Natural South Mist Feeder Extension - Final Order on Site Certificate (Mar. 13, 2003)
	Idaho Power	Madison Rebuttal Exhibit H	Natural Resources Conservation Service, Custom Soil Resource Report for Morrow County Area, Oregon (Oct. 28, 2021)
	Idaho Power	Madison Rebuttal Exhibit I	Figures for Soil Orders and Productivity
	Idaho Power	Madison Rebuttal Exhibit J	Article: A Taxonomically Based, Ordinal Estimate of Soil Productivity for Landscape-Scale Analyses (Apr. 4, 2012)
	Idaho Power	Madison Rebuttal Exhibit K	Article: Long-Term Changes in Mollisol Organic Carbon and Nitrogen, Errata (Jan-Feb. 2010)
	Idaho Power	Madison Rebuttal Exhibit L	Article: Simulating Soil Organic Carbon Responses to Cropping Intensity, Tillage, and

			Climate Change in Pacific Northwest Dryland (Mar. 1,2018)
Idaho Power	Madison Rebuttal Exhibit M		United States Department of Agriculture, Wildland Fire in Ecosystems (Sept. 2005)
Idaho Power	Madison Rebuttal Exhibit N		Article: Benefits of Prescribed Burning (Aug. 2, 2013)
Fouty/STOP B2H	Suzanne Fouty Surrebuttal Testimony on Issue SP-1		Written testimony
Fouty/STOP B2H	Fouty Surrebuttal Exhibit A		Article: Land use and climate change impacts on global soil erosion by water (2015-2070) (2020)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit B		Article: Organic Carbon in Soils of the World (chapter 3) in The Role of Terrestrial Vegetation in the Global Carbon Cycle: Measurement by Remote Sensing (1984)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit C		Article: Long-Term Effectiveness of Restoration Treatments on Closed Wilderness Campsites (2013)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit D		Article: Minimizing Soil Compaction in Pacific Northwest Forests (1983)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit E		Article: Influence of road reclamation techniques on forest ecosystem recovery (2013)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit F		Article: Effectiveness of Road Ripping in Restoring Infiltration Capacity of Forest Roads (1997)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit G		Article: Physical and Chemical Characteristics of Ash-influenced soils of Inland Northwest Forests (2007)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit H		Article: Soil physical property changes at the North American Long-Term Soil Productivity study sites: 1 and 5 years after compaction (2006)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit I		Article: The effect of sparse vegetative cover on erosion and sediment yield (1991)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit J		Article: Landscape-scale carbon storage associated with beaver dams (2013)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit K		Article: Land use types and geomorphic settings reflected in soil organic carbon distribution at the scale of watershed (2018)
Fouty/STOP B2H	Fouty Surrebuttal Exhibit L		Article: Land-use/cover conversion affects soil organic-carbon stocks: A case study along the main channel of the Tarim River, China (2018)
Idaho Power	Mark Madison Sur-surrebuttal Testimony		Written Testimony
Idaho Power	Madison Sur-surrebuttal Exhibit A		Revised Exhibit D of Madison Rebuttal Testimony – Updated Table I-2-1
Idaho Power	Madison Sur-surrebuttal Exhibit B		Annual Data Refresh of Soil Survey Data - NRCS
Idaho Power	Madison Sur-surrebuttal Exhibit C		Idaho Power's Supplemental Response to STOP B2H's Request for Production No. 5 (March 5, 2021)
Fouty	Fouty Cross-Examination Exhibit M		Idaho Power's Responses to STOP B2H's Discovery Requests (Feb. 5, 2021)

	Fouty	Fouty Cross-Examination Exhibit N	Forest Service Manual: FSM 2500- Watershed and Air Management, Chapter 2250 – Soil Management (2010)
		Mark Madison Cross-Examination Testimony	Hearing Transcript – Day 2 (January 11, 2022)
	Fouty	Fouty Transcript Corrections to Day 2 Hearing Transcript	Corrections to Hearing Transcript – Day 2
	Idaho Power	Idaho Power Transcript Corrections to Day 2 Hearing Transcript	Corrections to Hearing Transcript – Day 2
	ODOE	ODOE Corrections to Cross-Examination Hearing Day 2	Corrections to Hearing Transcript – Day 2
SS-1	N/A	(no additional evidence offered)	
SS-2	N/A	(no additional evidence offered)	
SS-3 and SS-5	Horst/Cavinato	Joe Horst Direct Testimony on Issue SS-3	Written testimony
	Horst/Cavinato	Horst Exhibit A-3	Map: City of La Grande Geologic Hazard Zone
	White	Jonathan D. White Direct Testimony on Issue SS-5	Written testimony
	Idaho Power	Robert A. Cummings Rebuttal Testimony	Written testimony
	Idaho Power	Cummings Rebuttal Exhibits A through G	(See descriptions for Cummings Rebuttal Exhibits A through G set out above with Issue PS-10)
	Idaho Power	Kekoa Cody Sorensen Rebuttal Testimony – Issues SS-3 and SS-5	Written testimony
	Idaho Power	Sorensen Rebuttal Exhibit A	Curriculum Vitae
	Idaho Power	Sorensen Rebuttal Exhibit B	Article: Electrical Resistivity Survey in Soil Science: A Review, 83 Soil & Tillage Rsch. 173 (2005)

APPENDIX 2
TABLE OF EXHIBITS ADMITTED – SUMMARY DETERMINATION PHASE

Issue	Offered By	Testimony/Exhibit	Document Description
M-1	Idaho Power	MSD Exhibit A	Wheatridge Wind Energy Facility Final Order
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
M-2	Idaho Power	MSD Exhibit A	Wheatridge Wind Energy Facility Final Order
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
	Gilbert	Response Exhibit 1	Gilbert Declaration (undated)
M-3	Idaho Power	MSD Exhibit A	Wheatridge Final Order
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit C	Jocelyn Pease Affidavit
	Idaho Power	MSD Exhibit C, Attachment 1	Discovery requests to Cooper
	Idaho Power	MSD Exhibit C, Attachment 2	Cooper Response to Interrogatories
M-4⁴⁴⁶	Idaho Power	MSD Exhibit A	Wheatridge Final Order
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit
M-5⁴⁴⁷	Idaho Power	MSD Exhibit A	Wheatridge Wind Energy Facility Final Order
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
M-7	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit C, Attachment 3	Discovery requests to Proesch
	Idaho Power	MSD Exhibit C, Attachment 4	Email from Rackner to Proesch, Feb. 11, 2021
	Idaho Power	MSD Exhibit C, Attachment 5	Email from Proesch, April 16, 2021
	Idaho Power	MSD Exhibit C, Attachment 6	Email from Pease to Proesch, April 19, 2021
	Idaho Power	MSD Exhibit C, Attachment 7	Email from Garcia to Proesch, April 19, 2021
	Idaho Power	MSD Exhibit D	Affidavit of Kurtis Funke
	Idaho Power	MSD Exhibit D, Attachment 1	Aston Property Title Report, May 17, 2018
	Idaho Power	MSD Exhibit D, Attachment 2	Warranty Deed from Wright to Aston
	Idaho Power	MSD Exhibit D, Attachment 3	Aston Property Supplemental Title Report, Jan. 21, 2021
FW-1	Idaho Power	MSD Exhibit A	EO 15-18, Adopting the Oregon Sage-Grouse Action Plan
		MSD Exhibit B	Sage-Grouse Conservation Partnership, 2015
		MSD Exhibit C	Greater Sage-Grouse Habitat Mitigation

⁴⁴⁶ Limited parties Jim and Jane Howell withdrew from the contested case after Issues M-4 and M-5 were dismissed on summary determination.

⁴⁴⁷ See note 1 above.

			Program Manual, Oct. 2019
		MSD Exhibit D	Zachary Funkhouser Affidavit, May 25, 2021
		MSD Exhibit E	ODFW Oregon Sage-Grouse Habitat Quantification Tool User Guide
	STOP B2H/Squire	(no additional evidence submitted with memos in opposition to MSD)	
FW-4	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
	Gilbert	(no supporting documents submitted with Gilbert Objection and Response)	
FW-9, FW-10, and FW-11	Idaho Power	(no evidence in addition to documents included in the B2H Project Record)	
FW-12	Idaho Power	MSD Exhibit D	Zachary Funkhouser Affidavit, May 25, 2021
	March	(no supporting documents submitted with March Response to MSD Issue FW-12)	
	Idaho Power	Reply Exhibit A	Chris James Affidavit, July 8, 2021
FW-13	Idaho Power	MSD Exhibit A	Jocelyn Pease Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit A, Attachment 1	Discovery Requests to McAllister
	Idaho Power	MSD Exhibit A, Attachment 2	McAllister Response to Interrogatory No. 4
	Idaho Power	MSD Exhibit A, Attachment 3	McAllister Response to Interrogatory No. 5
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
	McAllister	McAllister Affidavit 2	McAllister Affidavit in Opposition to MSDs, July 8, 2021
	McAllister	McAllister Affidavit 2, Exhibit 1	Supplemental discovery responses, May 8, 2021
	McAllister	McAllister Affidavit 2, Exhibit 2	Discovery Requests to Idaho Power
		McAllister Affidavit 2, Exhibit 3	Idaho Power Response to Discovery Requests, Feb. 5, 2021
	McAllister	McAllister Affidavit 2, Exhibit 4	Vascular Plants of Morgan Lake Park, 2021
	McAllister	McAllister Affidavit 2, Exhibit 5	Discovery Requests to ODOE
	McAllister	McAllister Affidavit 2, Exhibit 6	ODOE Response to Discovery Requests
	McAllister	McAllister Affidavit 2, Exhibit 7	McAllister Response to Idaho Power Discovery Requests, Feb. 5, 2021
	McAllister	Susan Geer Declaration	Geer Declaration in support of McAllister's Opposition to MSDs, Issue FW-13, July 9, 2021
HCA-2	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Carbiener	(no supporting documents submitted with Carbiener Response)	

		to MSD Issue HCA-2)	
HCA-5	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit B	Wheatridge Wind Energy Facility Final Order
LU-2 and LU-3	Idaho Power	MSD Exhibit A	Jocelyn Pease Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit A, Attachment 1	Discovery Request to Kathryn Andrew
	Idaho Power	MSD Exhibit A, Attachment 2	Andrew Response to Interrogatories
	Idaho Power	MSD Exhibit C	Zachary Funkhouser Affidavit, May 25, 2021
	K. Andrew	Andrew Affidavit in Response to MSD Issue LU-3	Kathryn Andrew Affidavit, June 25m 2021
	K. Andrew	Andrew Response Exhibit 1	Potts v. Clackamas Co., LUBA 2001-201
	K. Andrew	Andrew Response Exhibit 2	Rogue Advocates v. Josephine Co, LUBA 2012
	K. Andrew	Andrew Response Exhibit	Scott Hartell Deposition transcript, June 10, 2021
	K. Andrew	Andrew Response Exhibit	Cattoche v. Lane Co., LUBA 2018-109
	K. Andrew	Andrew Response Exhibit	Wetherell v. Douglas Co., LUBA 2010-052
LU-5 and LU-6	Idaho Power	MSD Exhibit A	Jocelyn Pease Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit A, Attachment 3	Discovery Request to Irene Gilbert
	Idaho Power	MSD Exhibit A, Attachment 4	Gilbert Response to Discovery Requests
	Idaho Power	MSD Exhibit C	Zachary Funkhouser Affidavit, May 25, 2021
	Gilbert	Gilbert Affidavit in Response to MSD Issue LU-5	Irene Gilbert Affidavit, June 25, 2021
	Gilbert	Gilbert Response Exhibit 1	Potts v. Clackamas Co., LUBA 2001-201
	K. Andrew	Gilbert Response Exhibit 2	Rogue Advocates v. Josephine Co, LUBA 2012
	K. Andrew	Gilbert Response Exhibit	Scott Hartell Deposition transcript, June 10, 2021
	K. Andrew	Gilbert Response Exhibit	Cattoche v. Lane Co., LUBA 2018-109
	K. Andrew	Gilbert Response Exhibit	Wetherell v. Douglas Co., LUBA 2010-052
LU-10	Idaho Power	(no evidence in addition to documents included in the B2H Project Record)	
N-1, N-2 and N-3	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit B	Lisa Rackner Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit B, Attachment 1	Idaho Power Company Final Comments in OPUC Docket LC 74
	Idaho Power	MSD Exhibit B, Attachment 2	STOP B2H Final Comments in OPUC Docket LC 74
	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
	STOP B2H	(no additional evidence in response to MSDs)	

	Idaho Power	Reply Exhibit A	OPUC Docket LC 74, Order No. 21-184, June 4, 2021
	Idaho Power	Reply Exhibit B	Jared Ellsworth Affidavit, July 8, 2021
NC-5	Idaho Power	MSD Exhibit A	ODEQ Internal Management Directive, July 2003
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
R-2	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit B	Morgan Lake Park Recreational Use and Development Plan
	McAllister	McAllister Affidavit in Opposition to MSD Issue R-2	Michael McAllister Affidavit, June 24, 2021
	McAllister	McAllister Response Exhibit 1	City of La Grande Comments on Amended Preliminary ASC, Aug. 31, 2017
	McAllister	McAllister Response Exhibit 2	Idaho Power Response to City of La Grande Comments, April 27, 2018
	McAllister	McAllister Response Exhibit 3	City of La Grande Proclamation, April 3, 2019
	McAllister	McAllister Response Exhibit 4	B2H ASC Union County Map 65
	McAllister	McAllister Response Exhibit 5	B2H Proposed Route and Morgan Lake Alternative, Map 3
	McAllister	McAllister Response Exhibit 6	McAllister Response to Idaho Power Ex Parte Communication with EFSC, May 28, 2021
	McAllister	Charles Gillis Affidavit in Opposition to MSD Issue R-2	Charles Gillis Affidavit, June 20, 2021
	McAllister	Kyann Sholtes Declaration in Opposition to MSD Issue R-2	Kyann Sholtes Declaration, June 21, 2021
	McAllister	Geoffrey Witek Declaration in Opposition to MSD Issue R-2	Geoffrey Witek Declaration, June 21, 2021
	L. Barry	Lois Barry Statement in Opposition to MSD Issue R-2	Lois Barry Statement, June 25, 2021
	Idaho Power	Reply Exhibit A	Zachary Funkhouser Affidavit, July 1, 2021
	Idaho Power	Reply Exhibit B	Scott Flinders Affidavit, July 8, 2021
	Idaho Power	Reply Exhibit B, Exhibit A to Flinders Affidavit	ASC Exhibit C, Attachment C-3, Map 8 Errata
	Idaho Power	Reply Exhibit B, Exhibit B to Flinders Affidavit	Detailed Map of Site Boundary near Morgan Lake Park
RFA-3	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Gillis	Charles Gillis Affidavit in Opposition to MSD Issue RFA-3	Charles Gillis Affidavit, June 25, 2021
	Gillis	Response Exhibit 1	News article re Wells Fargo Bank, Dec. 28, 2018
	Gillis	Response Exhibit 2	Washington Post article re former Wells Fargo Bank executive, Jan. 23, 2020
	Gillis	Response Exhibit 3	LA Times article re Wells Fargo CEO, March 28, 2019
	Idaho Power	Reply Exhibit A	Jocelyn Pease Affidavit, July 9, 2021
	Idaho Power	Reply Exhibit A, Attachment 1	EFSC Public Meeting Minutes, Jan. 22, 2021
	Idaho Power	Reply Exhibit A, Attachment 2	EFSC Staff Report, Jan. 8, 2021
	Idaho Power	Reply Exhibit A, Attachment 3	EFSC Staff Report, Attachment 3, Proposed

			2021 Pre-Approved Financial Institutions
SR-1	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit B	City of La Grande Comprehensive Plan
	Idaho Power	MSD Exhibit C	Morgan Lake Recreational Use and Development Plan
	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
SR-4	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit D	Union County Land Use Plan, page 45
	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
SR-5	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit E	Glass Hill Registration Confirmation Letter, Oct. 17, 2019
	Geer	(no additional evidence submitted in response)	
SR-6	Idaho Power	MSD Exhibit A	Zachary Funkhouser Affidavit, May 25, 2021
	Idaho Power	MSD Exhibit F	BLM Visual Resource Management System
	Idaho Power	MSD Exhibit G	USFS Landscape Aesthetics Handbook
	L. Barry	Lois Barry Affidavit	Lois Barry Affidavit, June 25, 2021
	L. Barry	Response Exhibit B	EFSC Order on Appeals,
	L. Barry	Response Exhibit C	USFS 1995 Agriculture Handbook
	L. Barry	Response Exhibit D	USFS 1974 Visual Management System
	STOP B2H	(no additional evidence submitted in response)	
SP-2	Idaho Power	MSD Exhibit A	Jocelyn Pease Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit A, Attachment 1	Discovery Requests to McAllister
	Idaho Power	MSD Exhibit A, Attachment 2	McAllister Response to Interrogatory No. 4
	Idaho Power	MSD Exhibit A, Attachment 3	McAllister Response to Interrogatory No. 5
	Idaho Power	MSD Exhibit B	Zachary Funkhouser Affidavit, May 25, 2021
	ODOE	(no evidence in addition to documents included in the B2H Project Record)	
	McAllister	McAllister Affidavit 2	McAllister Affidavit in Opposition to MSDs, July 8, 2021
	McAllister	McAllister Affidavit 2, Exhibit 1	Supplemental discovery responses, May 8, 2021
	McAllister	McAllister Affidavit 2, Exhibit 2	Discovery Requests to Idaho Power
		McAllister Affidavit 2, Exhibit 3	Idaho Power Response to Discovery Requests, Feb. 5, 2021
	McAllister	McAllister Affidavit 2, Exhibit 4	Vascular Plants of Morgan Lake Park, 2021
	McAllister	McAllister Affidavit 2, Exhibit 5	Discovery Requests to ODOE
	McAllister	McAllister Affidavit 2, Exhibit 6	ODOE Response to Discovery Requests
	McAllister	McAllister Affidavit 2, Exhibit 7	McAllister Response to Idaho Power Discovery Requests, Feb. 5, 2021

SS-4	Idaho Power	MSD Exhibit A	Jocelyn Pease Affidavit, May 28, 2021
	Idaho Power	MSD Exhibit A, Attachment 1	Discovery Requests to Virginia and Dale Mammen
	Idaho Power	MSD Exhibit A, Attachment 2	Mammen Response to Discovery Requests, Feb. 4, 2021
	Idaho Power	MSD Exhibit B	Wheatridge Wind Energy Facility Final Order
	Idaho Power	MSD Exhibit C	Zachary Funkhouser Affidavit, May 25, 2021
	Mammen	Dale and Virginia Mammen Affidavit	Dale and Virginia Mammen Affidavit, June 25, 2021
	Mammen	Response Exhibit 1	Letter to EFSC, August 10, 2019C
	Mammen	Response Exhibit 2(a), (b), (c) and (d)	City of La Grande Official Record Documents
	Mammen	Response Exhibit 3	Scott Hartell letter, June 22, 2021
	Mammen	Response Exhibit 4	Bart Barlow report, June 23, 2021
	Idaho Power	Reply Exhibit A	Luke Grebe Affidavit, July 12, 2021
TE-1	ODOE	Patrick Rowe Affidavit	Patrick Rowe Affidavit, May 27, 2021
	ODOE	MSD Exhibit 1	ODA Responses to Geer Discovery Requests, Feb. 19, 2021
	Idaho Power	(no evidence in addition to documents included in the B2H Project Record)	
	Geer	(no additional evidence submitted in response to MSDs)	










Attachment 6 Contested Case Order, As Amended by Council 2022-09-27

Final Audit Report

2022-10-06

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