Attachment BB-1

Plan for an Alternative Practice

ATTACHMENT BB-1
PLAN FOR AN ALTERNATE PRACTICE

PLAN FOR AN ALTERNATE PRACTICE

Boardman to Hemingway Transmission Line Project

1221 West Idaho Street
Boise, Idaho 83702

Application for Site Certificate

September 2018

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Appendix A. Estimated Forest Clearance Map Book

ACRONYMS AND ABBREVIATIONS

FPA	Forest Practices Act
kV	kilovolt
IPC	Idaho Power Company
NERC	North American Electric Reliability Corporation
OAR	Oregon Administrative Rule
Project	Boardman to Hemingway Transmission Line Project
RMA	Riparian Management Area
ROW	right-of-way

1.0 INTRODUCTION

Idaho Power Company (IPC) is proposing to construct, operate, and maintain the Boardman to Hemingway Transmission Line Project (Project), a high-voltage electric transmission line between Boardman, Oregon, and the Hemingway Station in southwestern Idaho. The Project consists of approximately 296.6 miles of electric transmission line, with 272.8 miles located in Oregon and 23.8 miles in Idaho. The Project includes 270.8 miles of single-circuit 500-kilovolt (kV) transmission line, removal of 12 miles of existing 69-kV transmission line, rebuilding of 0.9 mile of a 230-kV transmission line, and rebuilding of 1.1 miles of an existing 138-kV transmission line into a new right-of-way (ROW).

The Forest Practices Reforestation Rules (Oregon Administrative Rule (OAR) Chapter 629, Division 610) generally require a landowner to replant (or ensuring natural regeneration of) the forest after a timber harvest and maintain the seedlings to the point that they are "free to grow" at a stocking level that meets the Forest Practices Act's (FPA) minimum stocking standards (see OAR 629-610-0000). If forestlands will be converted to a use not compatible with maintaining forest tree cover, the landowner must obtain written approval of a Plan for an Alternate Practice from the State Forester providing an exemption from the FPA's reforestation requirements (see OAR 629-610-0090(1)).

Here, certain portions of the Project will impact forestland and require permanent removal of the forest tree cover in order to ensure the trees do not come into contact with the Project structures or conductors and interrupt the flow of electrical energy across the Project. Vegetation removal and management is dictated by the North American Electric Reliability Corporation's (NERC) mandatory reliability standards, particularly standard FAC-003-3, Transmission Vegetation Management Program (NERC 2016). Because the Project will require permanent clearing of forestland, IPC submits to the Oregon Department of Forestry this Plan for an Alternate Practice allowing for an exemption from the reforestation rules. IPC will finalize the Plan prior to construction in forested lands.

2.0 PLANNED OPERATION

The Project will require the permanent clearing of the transmission line ROW for approximately 36.7 miles on private forestland and 4.5 miles of land administered by the U.S. Department of Agriculture Forest Service. The transmission line equipment will be owned by IPC. IPC will hold access rights to the ROW through easements, leases, grants, or licenses. The clearing operations will produce a linear clearcut on the transmission line ROW, and clearing will also occur along the Project roads. Most of the clearing will be done with ground-based systems used on slopes less than 30 percent and high-lead cable systems for slopes greater than 30 percent or for harvest near streams and their riparian management areas. There may be some areas where a skyline cable system will need to be utilized. IPC does not anticipate the need for helicopter logging. A detailed description of IPC's plans for clearing the ROW is provided in Exhibit K, Attachment K-2, Right-of-Way Clearing Assessment. The affected lands will no longer be available for the maintenance of forest tree cover, requiring the State Forester's approval of a Plan for an Alternate Practice (see OAR 629-605-0100(d)).

3.0 DESCRIPTION OF THE AREA

The Project will cross portions of the Wallowa-Whitman National Forest, Bureau of Land Management–administered public lands, and private timber lands located primarily in the Blue Mountains between McKay Creek—which is located to the east of Pilot Rock—in Umatilla County and the town of North Powder in Union County, Oregon. The operational area of interest

for the acreage estimate is a 125-foot buffer on each side of the transmission line centerline (250-foot-wide corridor),[1] the construction footprint of all Project features outside of the centerline corridor, and a 15-foot buffer each side (30-foot width) of proposed new roads. IPC projects that approximately 776 acres of forested lands will be cleared or harvested in Umatilla and Union counties (Tables 3-1 and 3-2) along the Proposed Route. For the Morgan Lake Alternative Route in Union County, approximately 297 acres of forested lands will be cleared or harvested (Table 3-3). The balance of the 1,249-acre corridor is rangeland (473 acres). Maps showing the locations of the Project-related forest clearing activities are attached as Appendix A.

Table 3-1. Umatilla County - Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
Private	DF/Mx GF[1]	Small Sawtimber	9-20”	77.9
		Pole Size	5-8.9”	82.0
	Ponderosa Pine	Small Sawtimber	9-20”	24.5
		Pole Size	5-8.9”	30.0
	Forest-Other[2]	Reproduction	0-5”	31.2
Total Umatilla County				**245.6**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.
[2] Reproduction or recently disturbed forests.

Table 3-2. Union County - Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
BLM[2]	DF/Mx GF[1]	Small Sawtimber	9-20”	5.4
Private	DF/Mx GF	Small Sawtimber	9-20”	135.6
		Pole Size	5-8.9”	39.9
	Ponderosa Pine	Small Sawtimber	9-20”	150.7
		Pole Size	5-8.9”	6.4
	Forest-Other	Reproduction	0-5”	13.9
USFS[3]	DF/Mx GF	Small Sawtimber	9-20”	77.0
	Ponderosa Pine	Small Sawtimber	9-20”	101.2
Total Union County				**530.1**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.
[2] BLM=Bureau of Land Management.
[3] USFS – U.S. Department of Agriculture - Forest Service.

[1] While IPC may need to extend the ROW width up to 300 feet in certain forested areas to allow for maintenance of danger trees, those circumstances will be limited and the ROW will typically be 250 feet in most forested areas. Therefore, the 250-foot ROW width used by IPC to define the Forest Lands Analysis Area provides the best representation of the typical impact area.

Table 3-3. Union County - Morgan Lake Alternative Projected Forest Clearing/Harvest

Landowner	Forest Habitat Type	Timber Classification	Size Class	Acres
Private	DF/Mx GF[1]	Small Sawtimber	9-20”	135.3
		Pole Size	5-8.9”	12.9
	Ponderosa Pine	Small Sawtimber	9-20”	134.5
		Pole Size	5-8.9”	14.1
Total Morgan Lake Alternate in Union County				**296.8**

[1] DF/Mx GF = Douglas-fir/Mixed stand with grand fir and associated species.

The majority of the route is “small sawtimber” (74 percent) or “pole-sized” (20 percent) stands. About 6 percent of the forested lands were classified as “reproduction.” The rangelands are intermixed across all ownerships. No tilled lands occur on this corridor, but a small acreage of managed pastures occur versus unmanaged grasslands (range).

The majority of the Project is located in upland forest or rangeland areas with broad plateaus and rolling topography (with slopes up to 45 percent) broken by occasional perennial or seasonal streams. Where riparian areas occur in the forested portion of the Project, the riparian management area (RMA) vegetation varies, ranging from shrub dominated communities to conifer dominated stands at higher elevations. Common shrub species found in the RMAs include grey alder (*Alnus incana*), red oiser dogwood (*Cornus* sericea), chokecherry (*Prunus virginiana*), common snowberry (*Symphoricarpos albus*), and black hawthorn (*Crataegus douglasii*). Conifers commonly found in riparian communities include grand fir (*Abies grandis*), Engelmann spruce (*Picea engelmannii*), and Douglas-fir (*Pseudotsuga menziesii*). Quaking aspen (*Populus tremuloides*) is also found in RMAs within the ROW corridor.

4.0 REFORESTATION

IPC seeks an exemption under OAR 629-610-0090 from the reforestation requirements, because no reforestation with commercial tree species will be performed in the ROW. Tall-growing tree species are incompatible with NERC and IPC vegetation management programs designed to ensure reliable transmission of electricity and to avoid interference from trees that might come into contact with the transmission equipment.

IPC will convert the ROW to low-growing shrubs and grasses. By selectively managing the floor of the ROW to eliminate tall-growing tree species, the need to disturb the plant community over time will be greatly reduced and nearly eliminated. Long-term maintenance will then be limited to removal of hazard trees along the edges of the corridor that could reach the transmission line, along with treatment of pioneer tree species or noxious weeds that will occasionally invade the ROW.

Agricultural uses are acceptable and encouraged along the powerline ROW, provided they do not interfere with the Project. This can include, but is not limited to, pasture or rangeland, row crops, or other low-growing crops.

The intended land use change is under consideration by local, state, and federal agencies. All permits and approvals are currently being sought and will be in place prior to the harvest and clearing operations. The appropriate county assessors and local planning departments will be notified in writing of the proposed change in land use.

Transmission line construction will commence within 12 months of the completion of the harvest operations, and will be complete within 36 months of commencing. The transmission line

corridor will be maintained in a non-forested condition to provide for safe operation of the Project.

5.0 STREAMSIDE VEGETATION HARVEST

5.1 Protected Resources

There are a small number of streams that transect the Project route in the forested portion of the Project. The stream types include F, D, and N typed water. Most are seasonal streams that only flow during spring runoff or heavy rainfall. A small number of perennial streams do occur.

Type F: Has fish, may also be used for domestic water
Type D: Used for domestic water, does not have fish
Type N: All other streams

It is unlikely that clearances will be adequate to span any of the stream crossings without removal of tall growing tree species. In all cases, tall growing tree species will need to be removed from the riparian management zones of the streams and by prescription, replanted with low growing tree and shrub species that have a mature height of less than 10 feet.

5.2 List of Streams Affected

A list of streams including name, size, location, stream type, and RMA width will be provided in IPC's final Plan for an Alternate Practice prior to initiation of harvest activities. Prior to activity within 100 feet of type F or D streams, IPC will submit a written plan in accordance with OAR 629-605-0170.

5.3 Planned Resource Protection Measures

The National Electrical Safety Code requires a minimum clearance from various objects. The minimum clearance distances for vegetation management are identified in the Vegetation Management Plan (Exhibit P1, Attachment P1-4). As a result, some stream crossings will require that all tall growing trees and snags within the corridor be felled to avoid tree-wire conflicts and the outages and fires that could result.

No road construction will occur solely as part of the timber harvesting operations within the RMAs. However, road construction may occur in the RMA as part of the power line construction activity. These RMAs will be managed in accordance with the Vegetation Management Plan (Exhibit P1, Attachment P1-4).

Best Management Practices will be used to protect the RMAs and include, but are not limited to:

- Tree falling will be directional away from streams, unless requested otherwise by resource agencies.
- Any slash that enters a stream will be removed by hand for Type F and D streams and wetlands, or yarded if too large to handle by hand.
- Water quality protection will be provided to streams and wetlands. Operations near streams will be limited during periods of heavy rain to reduce potential impacts to the stream.
- Activities on slopes will include erosion and landslide control. Roads and skid trails will be located and managed to avoid erosion, and especially to avoid erosion that could reach a stream.

- Ground based systems will skid logs away from stream courses. Except at stream crossings, operators shall not locate skid trails within 35 feet of Type F or D streams.
- Project roads will be used for harvest access wherever possible.
- No skid roads will be located in the RMAs.
- Cable systems using full suspension will be used to yard across perennial streams when a ground-based system cannot be used to avoid the stream.
- Cable harvesting corridors will be limited to the extent necessary to remove cut trees.
- On deep canyon crossings where the wire is high above the ground, it may be possible to leave live conifers. In some cases, creation of short snags may be feasible.
- Desirable understory vegetation within the RMA will be retained to provide shade and soil erosion protection, and to provide biological weed control since they prevent pioneer tree and weed species from invading the site.
- Any down logs that are currently in the RMA will remain in place.
- When necessary, slash piles in the RMA could be burned but could have more value as wildlife habitat in some cases.

6.0 HARVEST UNIT SIZE

The Project ROW will be a continuous linear feature on the landscape, crossing numerous ownership boundaries. No one ownership is contiguous enough to exceed the 120-acre maximum harvest size. However, the entire length of the corridor on private land will exceed the 120-acre maximum. Logging slash will be managed to avoid creation of a fire hazard.

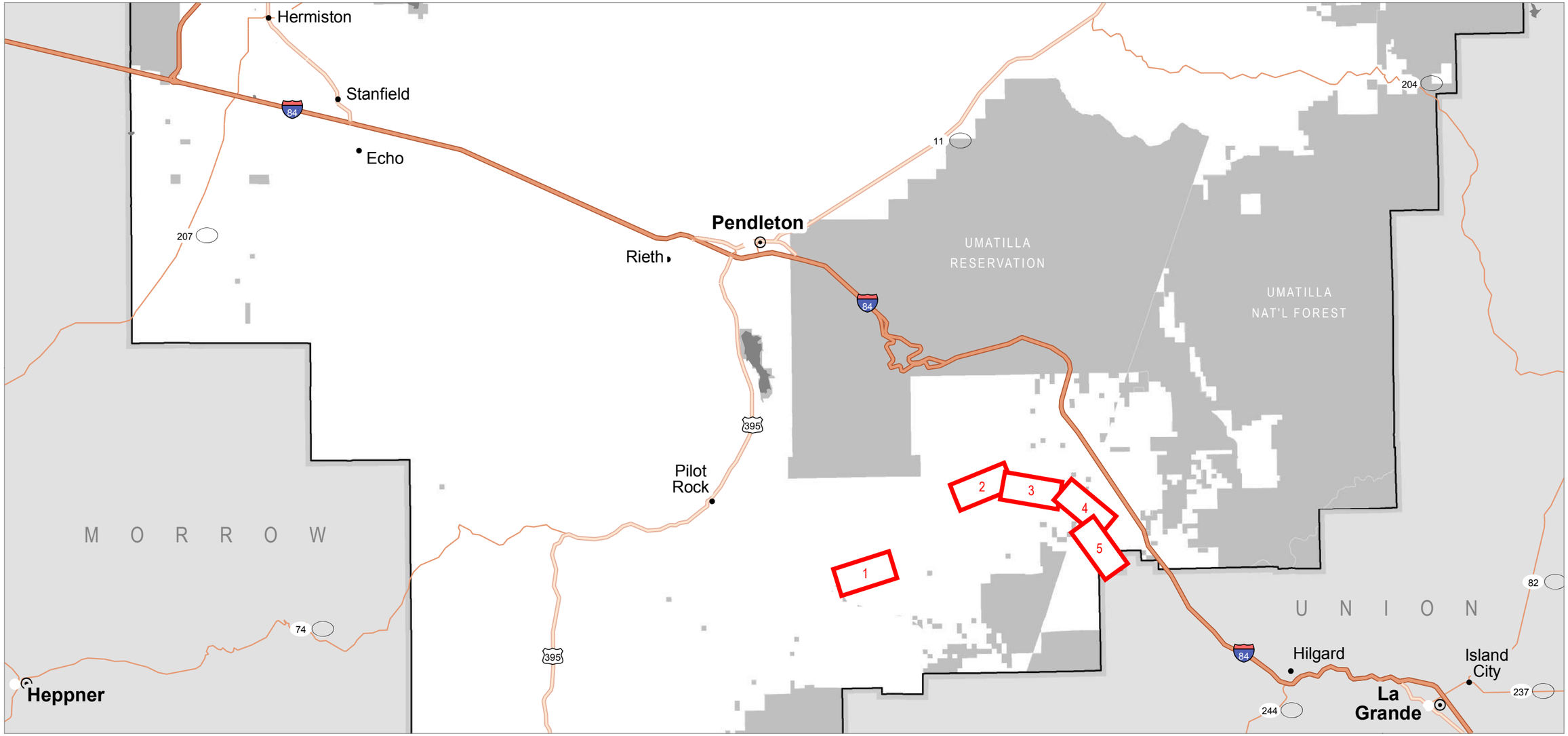
7.0 CONCLUSION

This Plan for an Alternate Practice provides sufficient evidence for the Energy Facility Siting Council to determine that the Project will comply with the provisions of the FPA relevant to converting the forestlands affected by the Project to a use not compatible with the maintenance of forest tree cover (see OAR 629-610-0090).

8.0 REFERENCES

NERC (North American Electric Reliability Corporation). 2016. Transmission Vegetation Management NERC Standard FAC-003-4. Available online at: http://www.nerc.com/_layouts/PrintStandard.aspx?standardnumber=FAC-003-4&title=Transmission%20Vegetation%20Management&jurisdiction=United%20States

APPENDIX A
ESTIMATED FOREST CLEARANCE MAP BOOK



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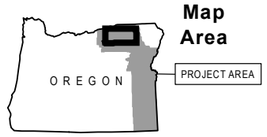
Map Area



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June 2017

Map Index

Location Map (Map #)

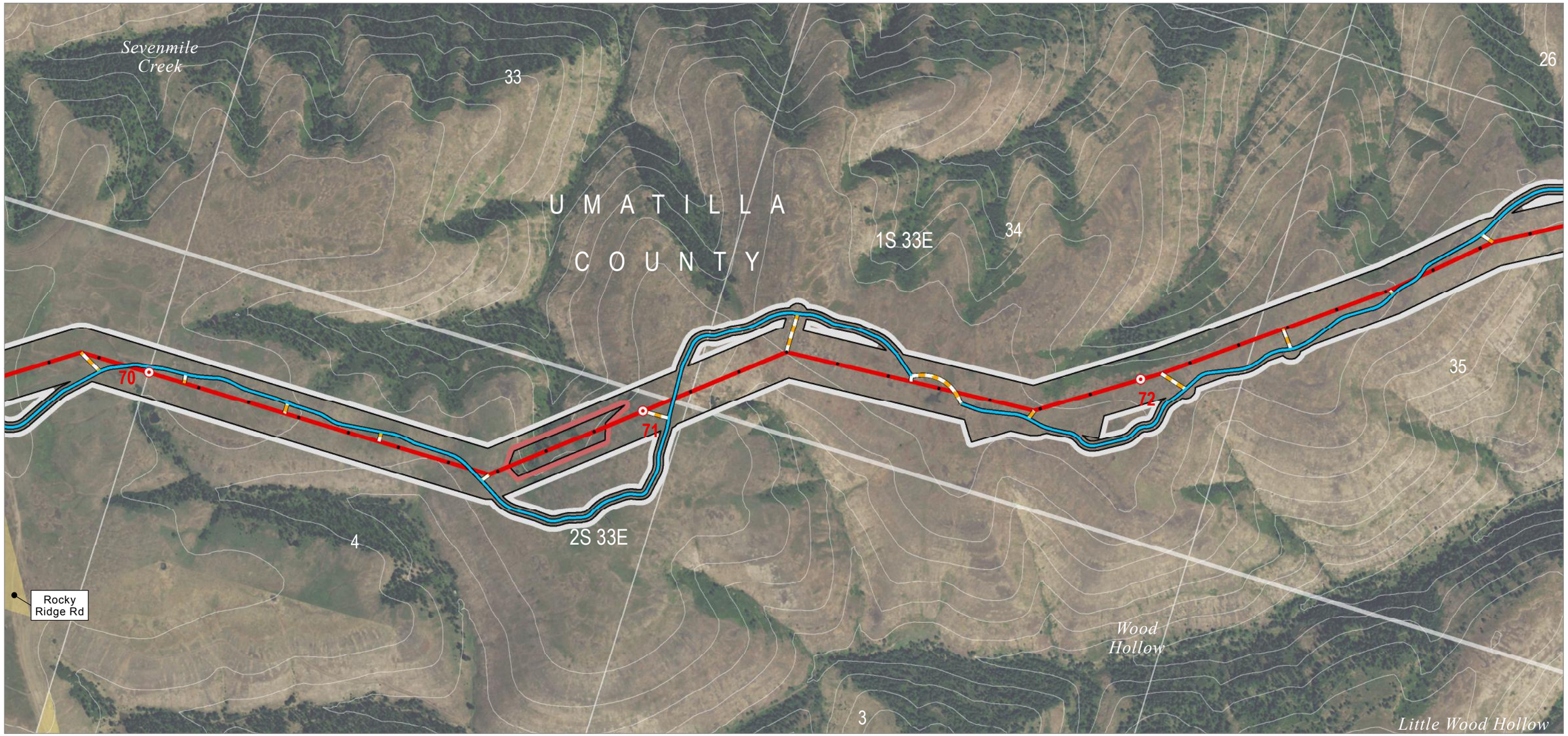
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Umatilla County

Map Index



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Map Area
OREGON
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

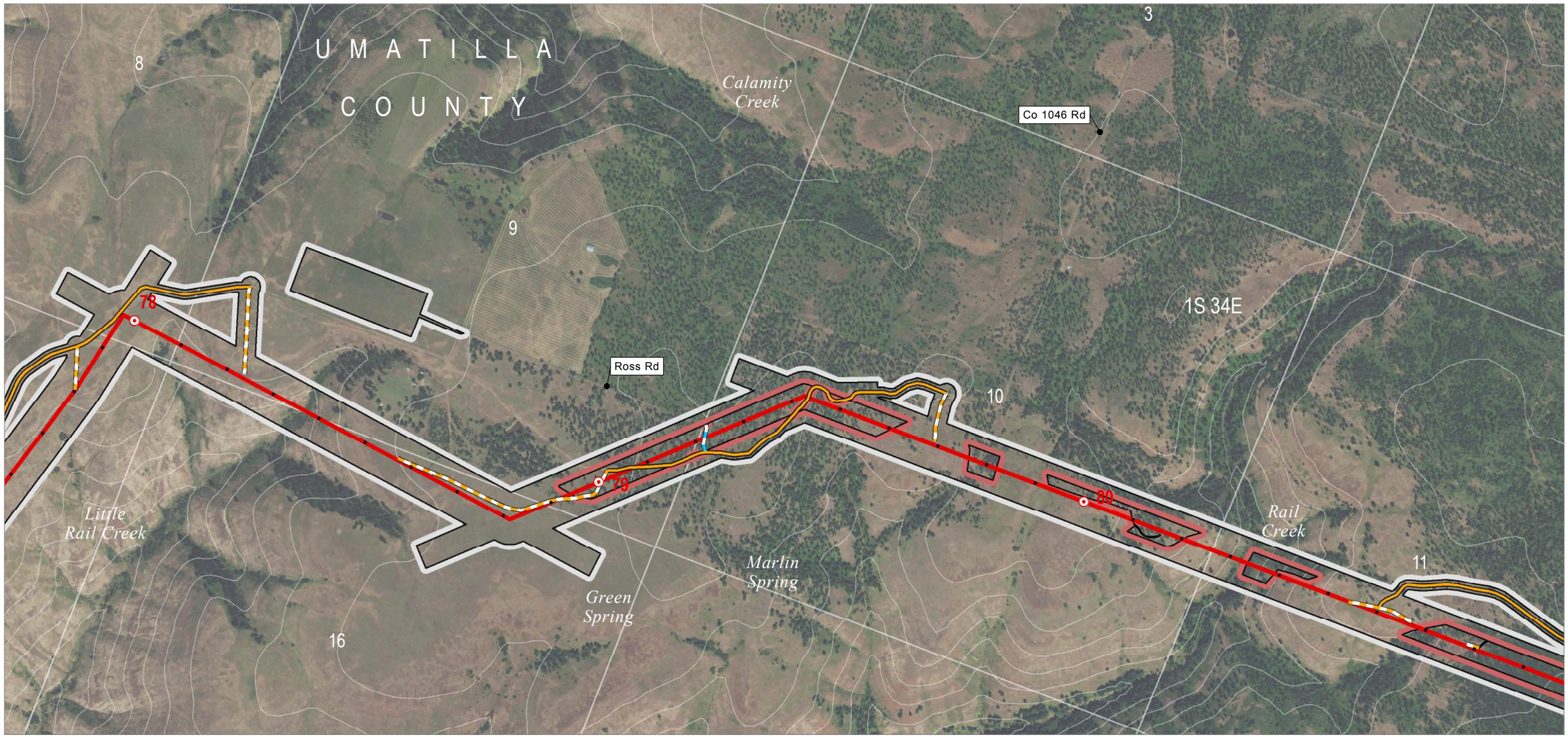
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 1



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Map Area
OREGON
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features
Site Boundary
Proposed Route
Route Centerline
Proposed Route
Mileposts
Mile
Tenth-mile

Access
Existing Road, Substantial Modification, 21-70% Improvements
New Road, Bladed
New Road, Primitive

Estimated Forest Disturbance
Right of Way Clearance

Land Status
Private

Important Siting Constraints and Other Features
100-foot Contours

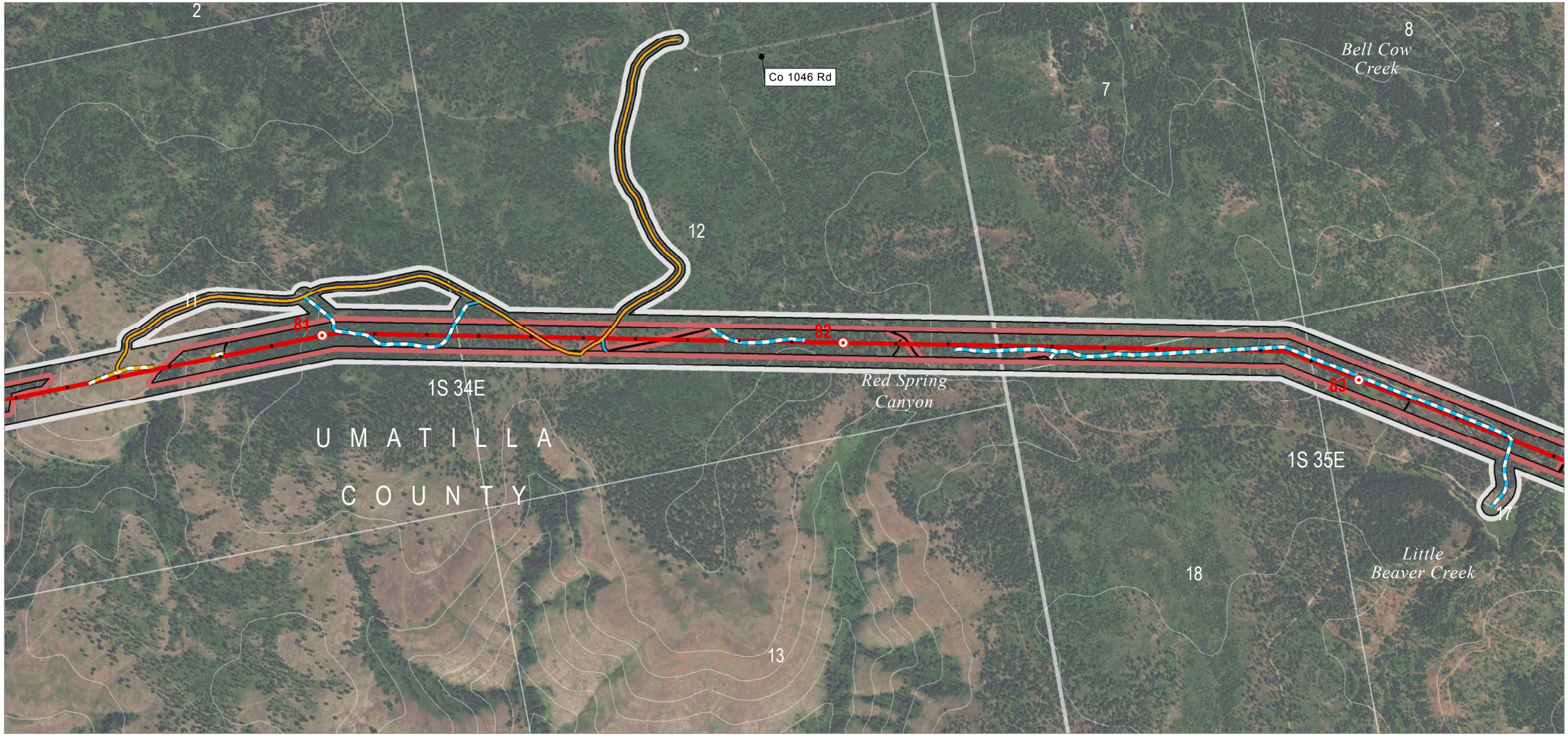
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 2



Map Area

OREGON

PROJECT AREA

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Feet

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

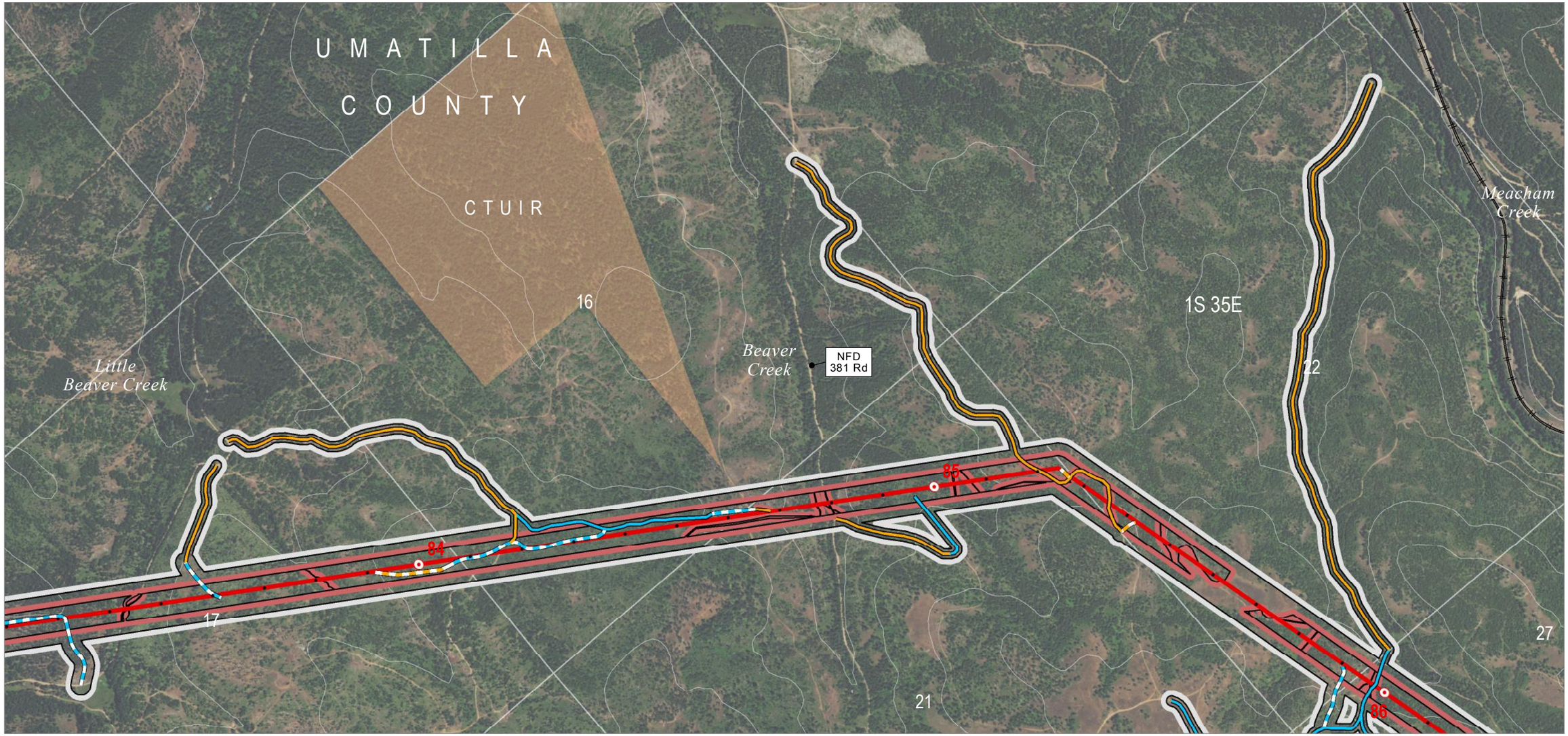
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 3



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Map Area
OREGON
PROJECT AREA

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Indian Reservation
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Railroads

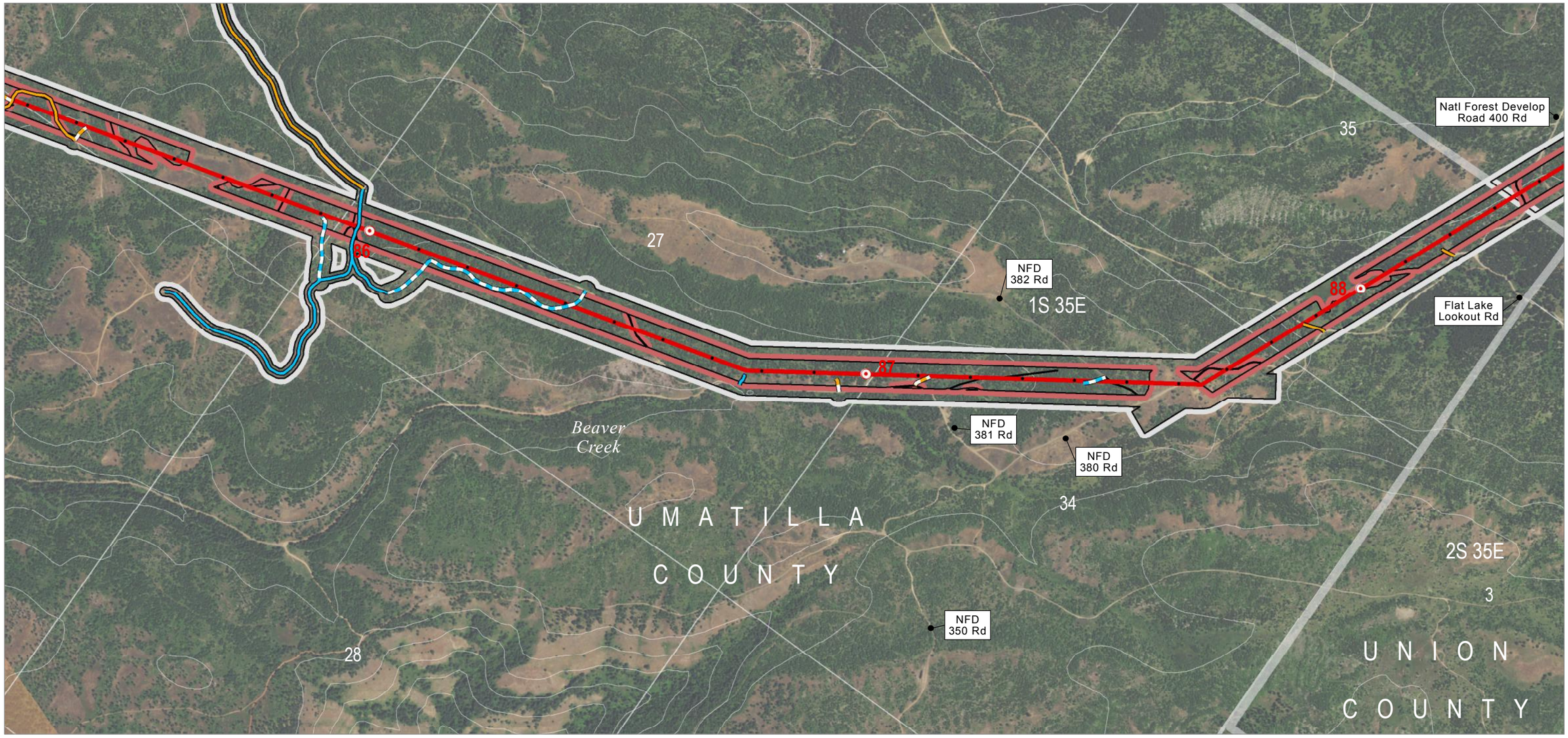
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 4



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Project Features
Site Boundary
Proposed Route
Route Centerline
Proposed Route
Mileposts
Mile
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Existing Road, Substantial Modification, 71-100% Improvements
New Road, Bladed
New Road, Primitive

Estimated Forest Disturbance
Right of Way Clearance

Land Status
Indian Reservation
Private

Important Siting Constraints and Other Features
100-foot Contours

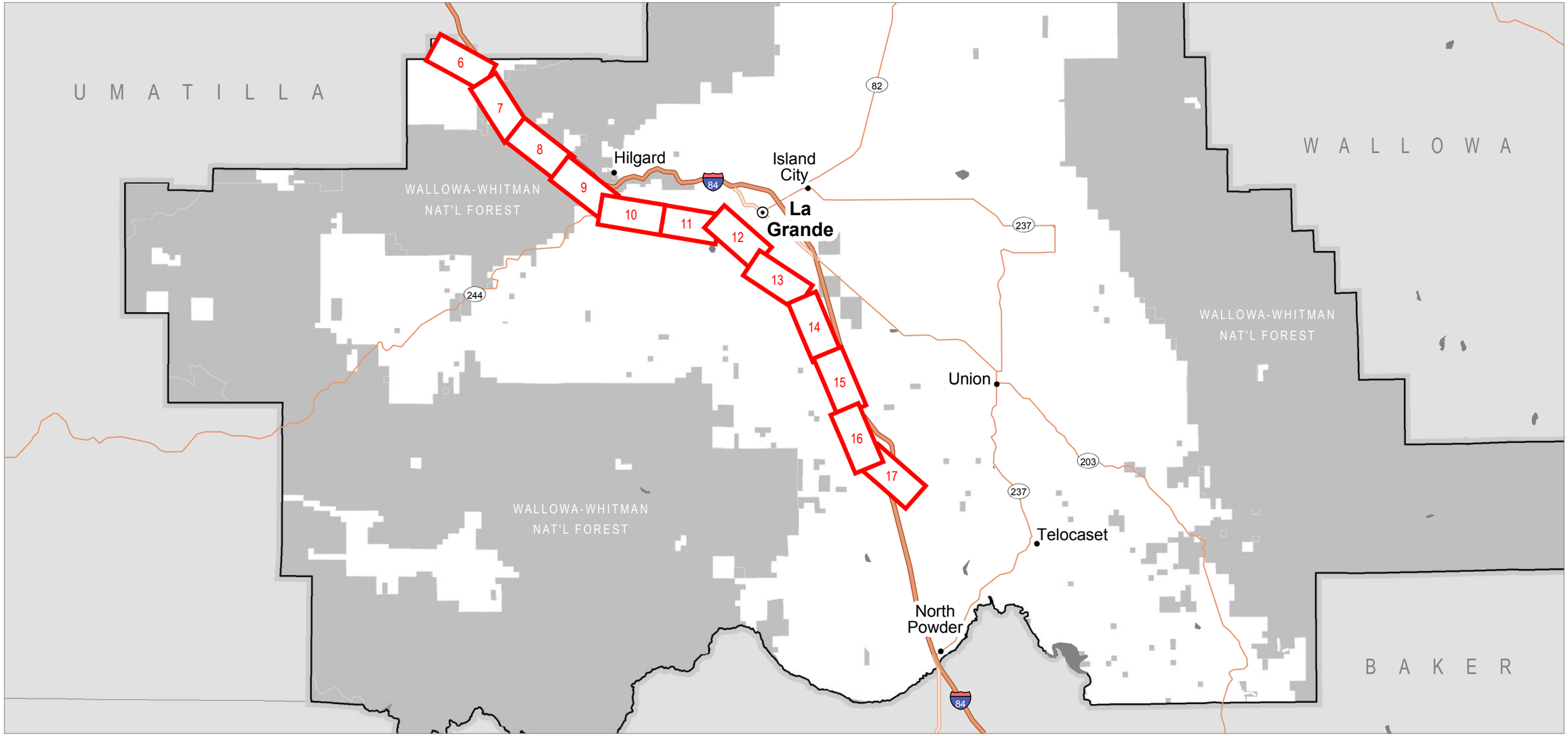
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Umatilla County

Map 5



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Miles

Map
Area
O R E G O N
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Map Index

Location Map (Map #)

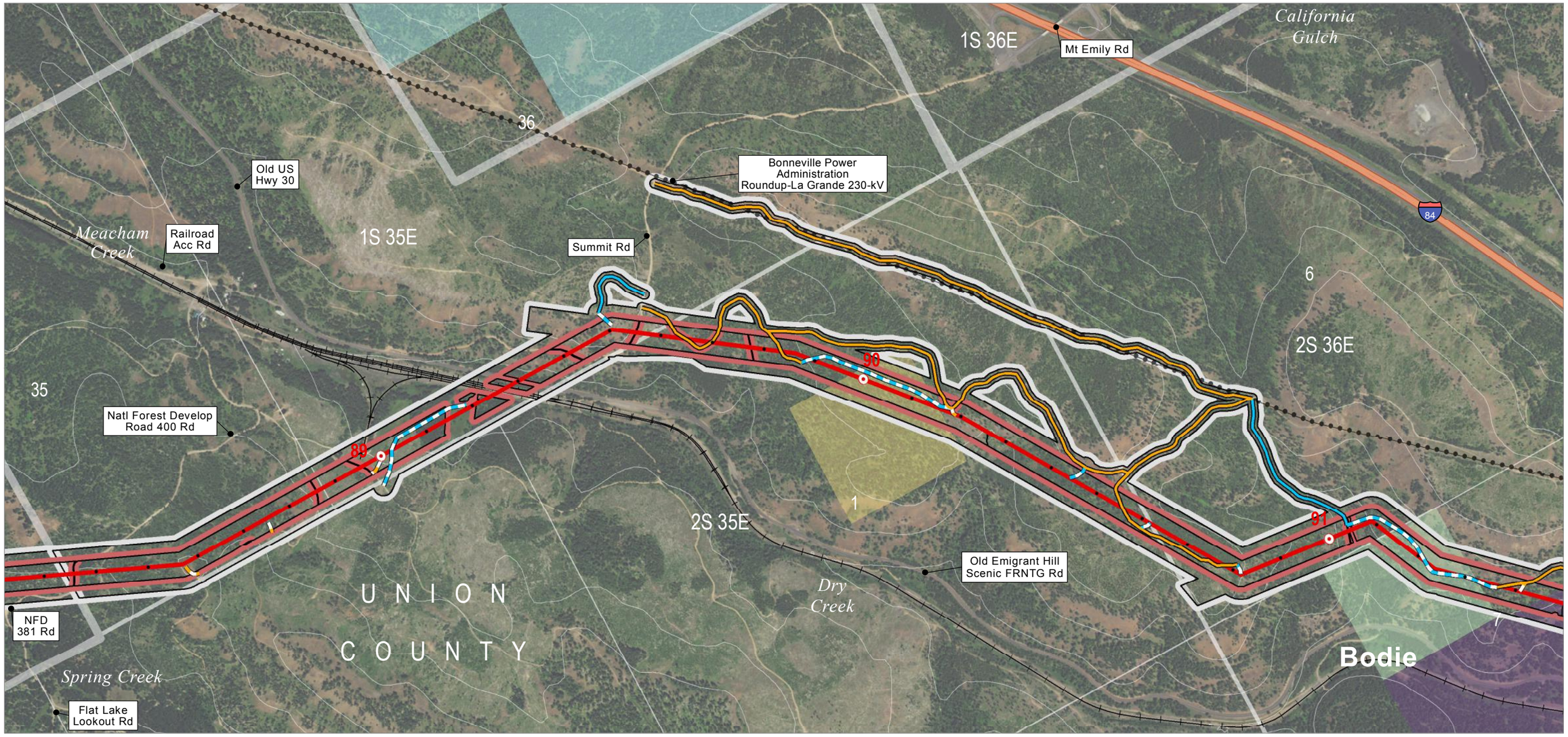
IDAHO POWER An IDACORP Company

Boardman to Hemingway
Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Union County

Map Index



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OREGON — PROJECT AREA

Map Area

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Project Features

Site Boundary
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Route Centerline
- Proposed Route

Mileposts
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- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

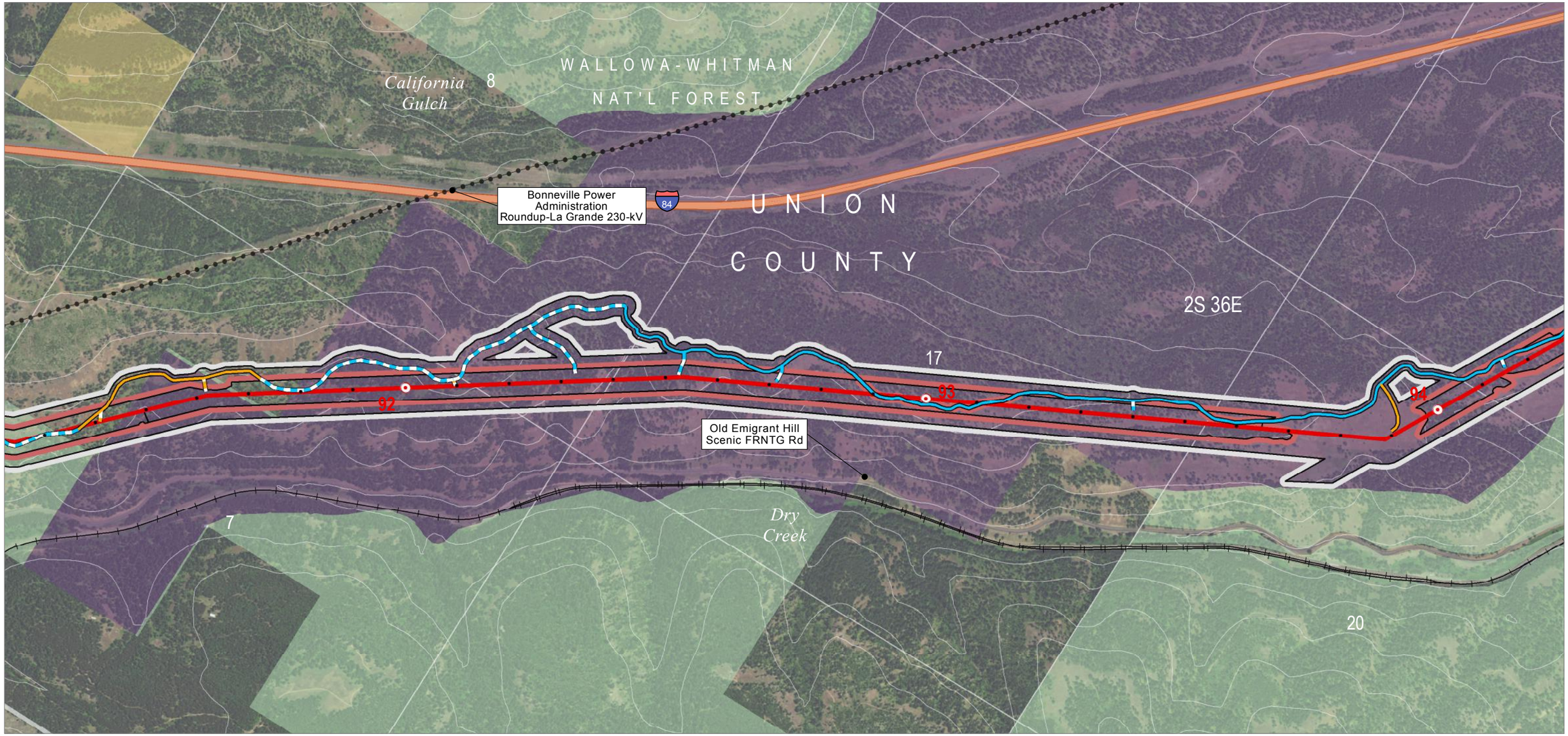
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 6



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Map Area
OREGON
PROJECT AREA

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- New Road, Primitive

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- Right of Way Clearance

Land Status
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- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

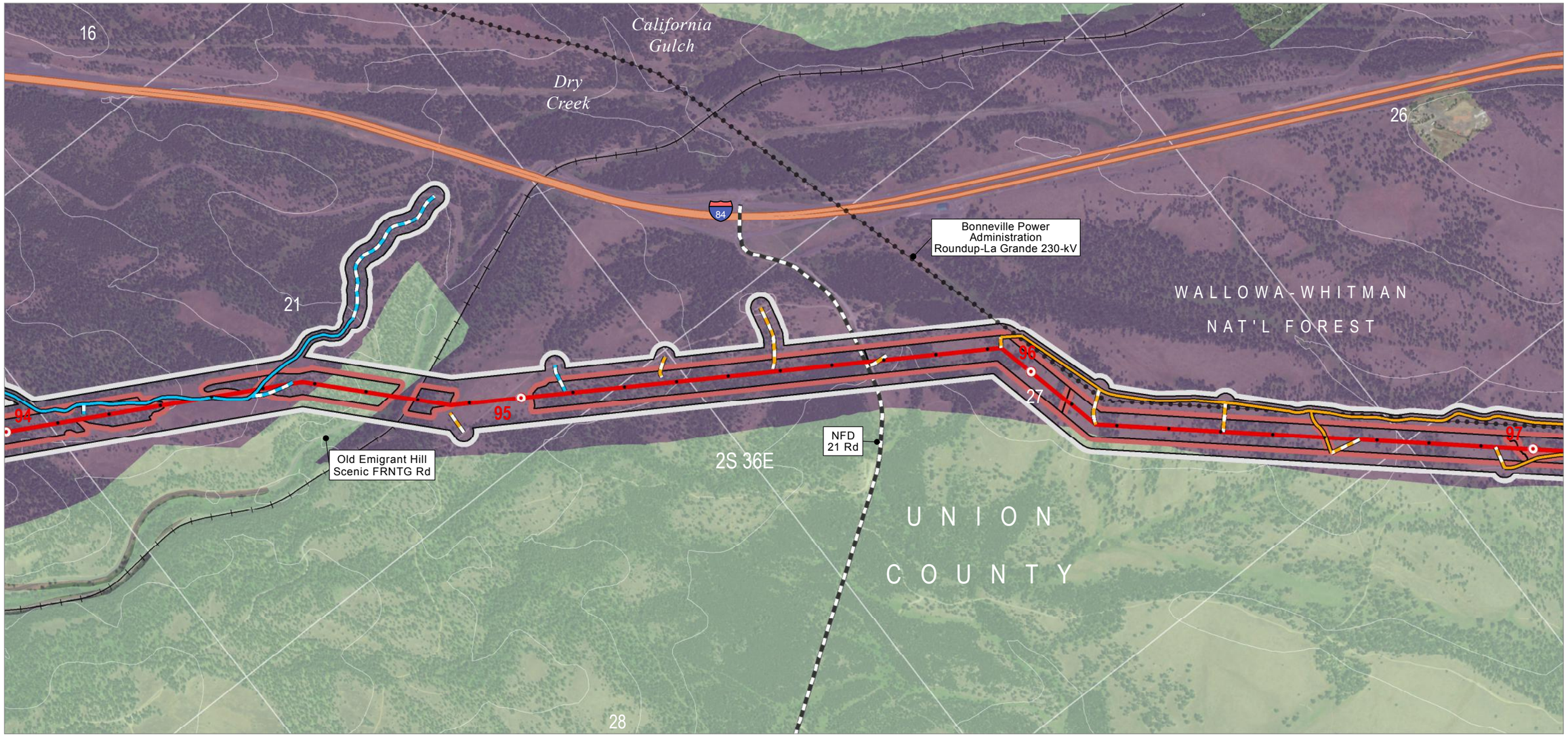
IDAHO POWER
An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 7



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Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Other Major Roads
- Railroads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

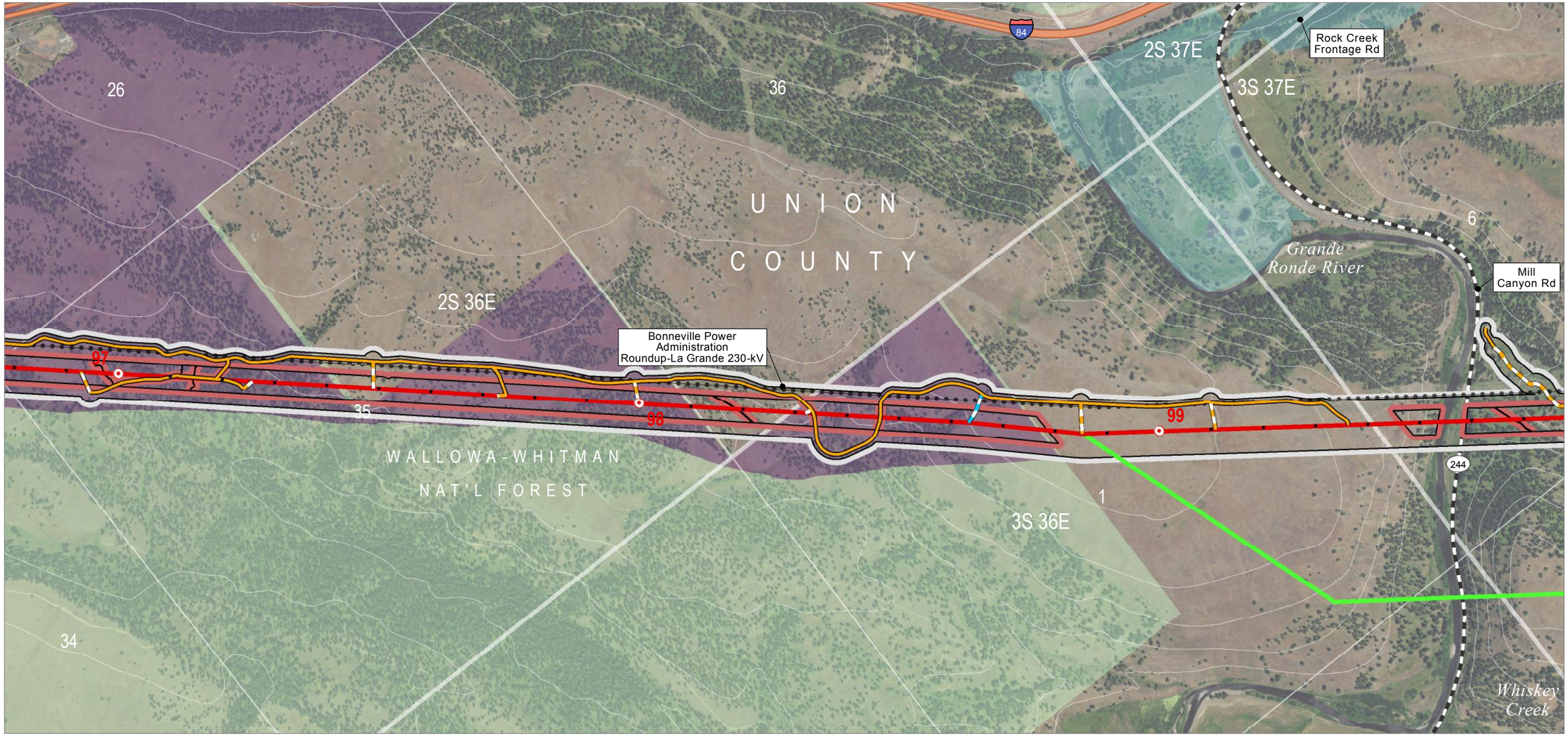
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 8



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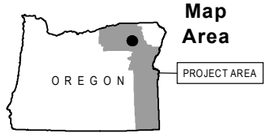
Map Area



Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private
- State or Local Wildlife or Parks and Recreation Area
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways
- Other Major Roads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

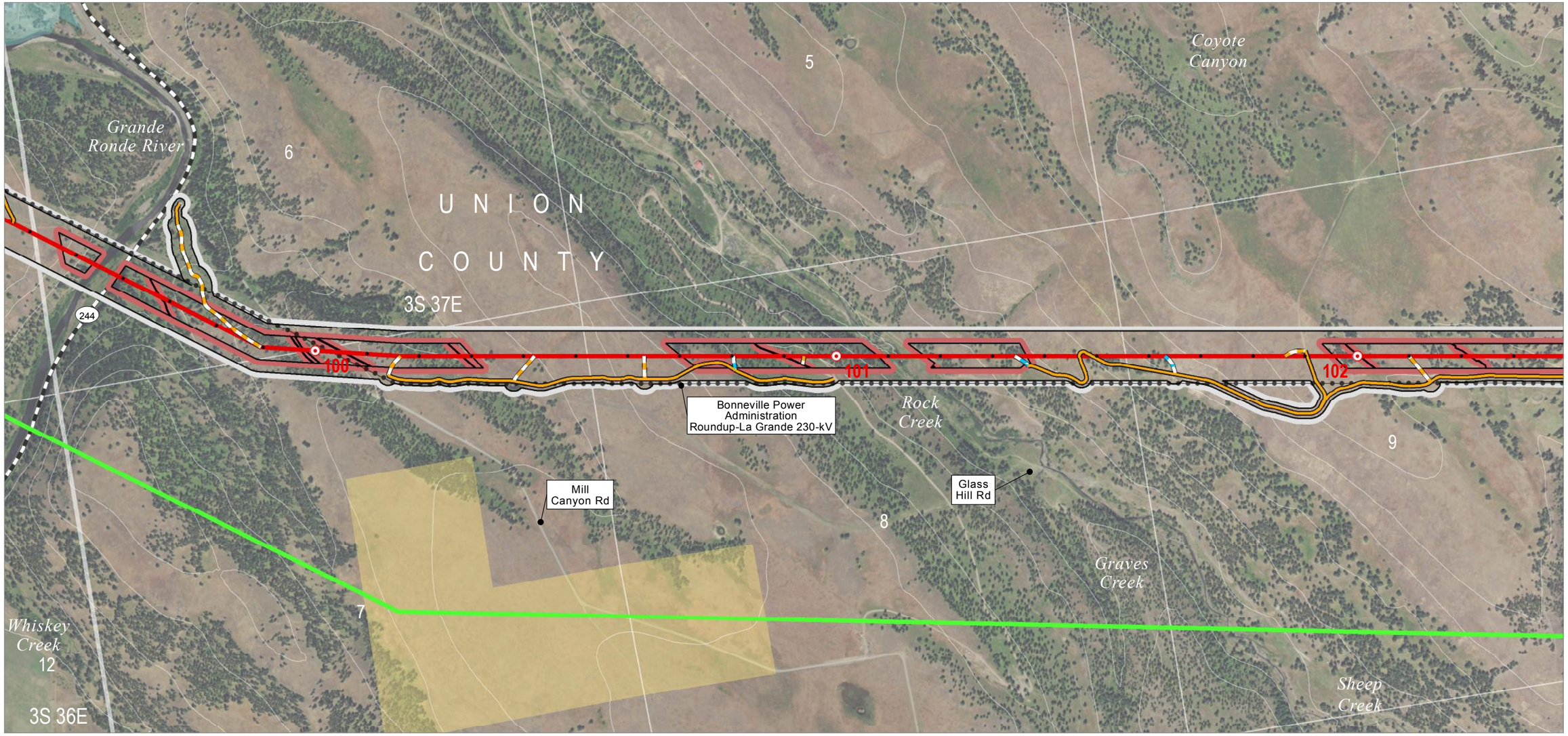
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 9



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Map Area

OREGON

PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local Wildlife or Parks and Recreation Area

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

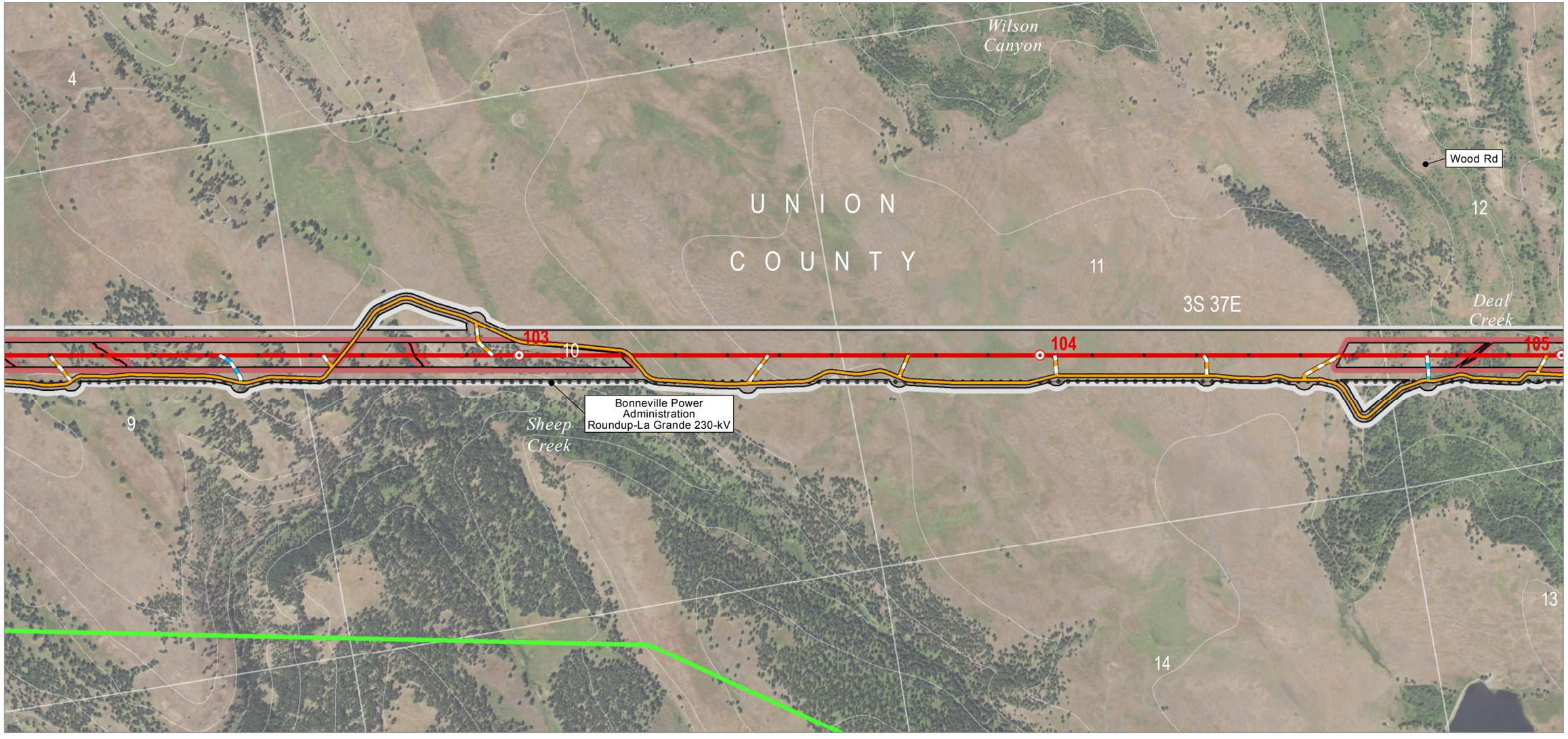
IDAHO POWER An IDACORP Company

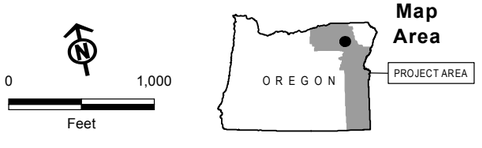
Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 10





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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

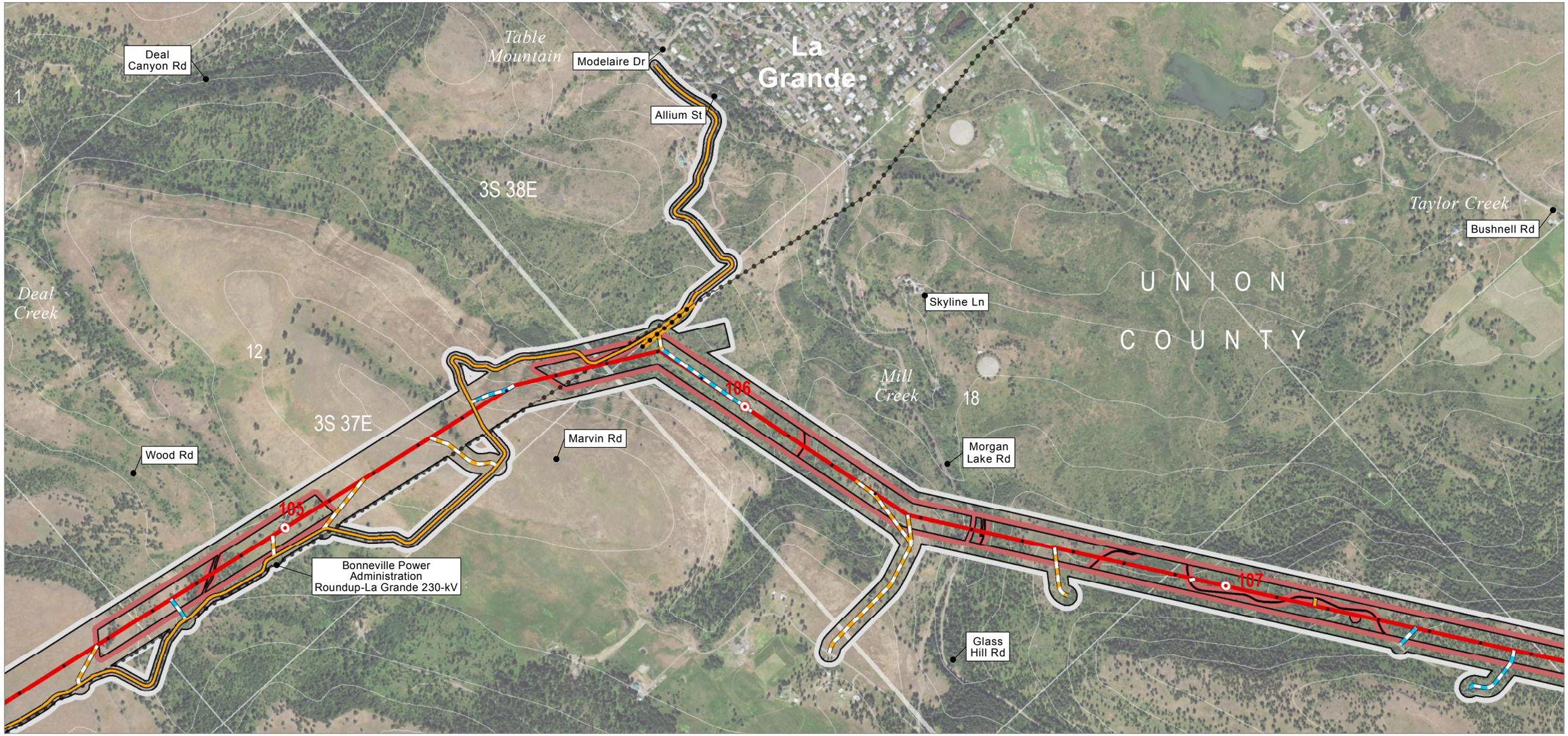
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 11



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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive
- Distribution Line to Communication Station (IPC Service Territory Only)

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

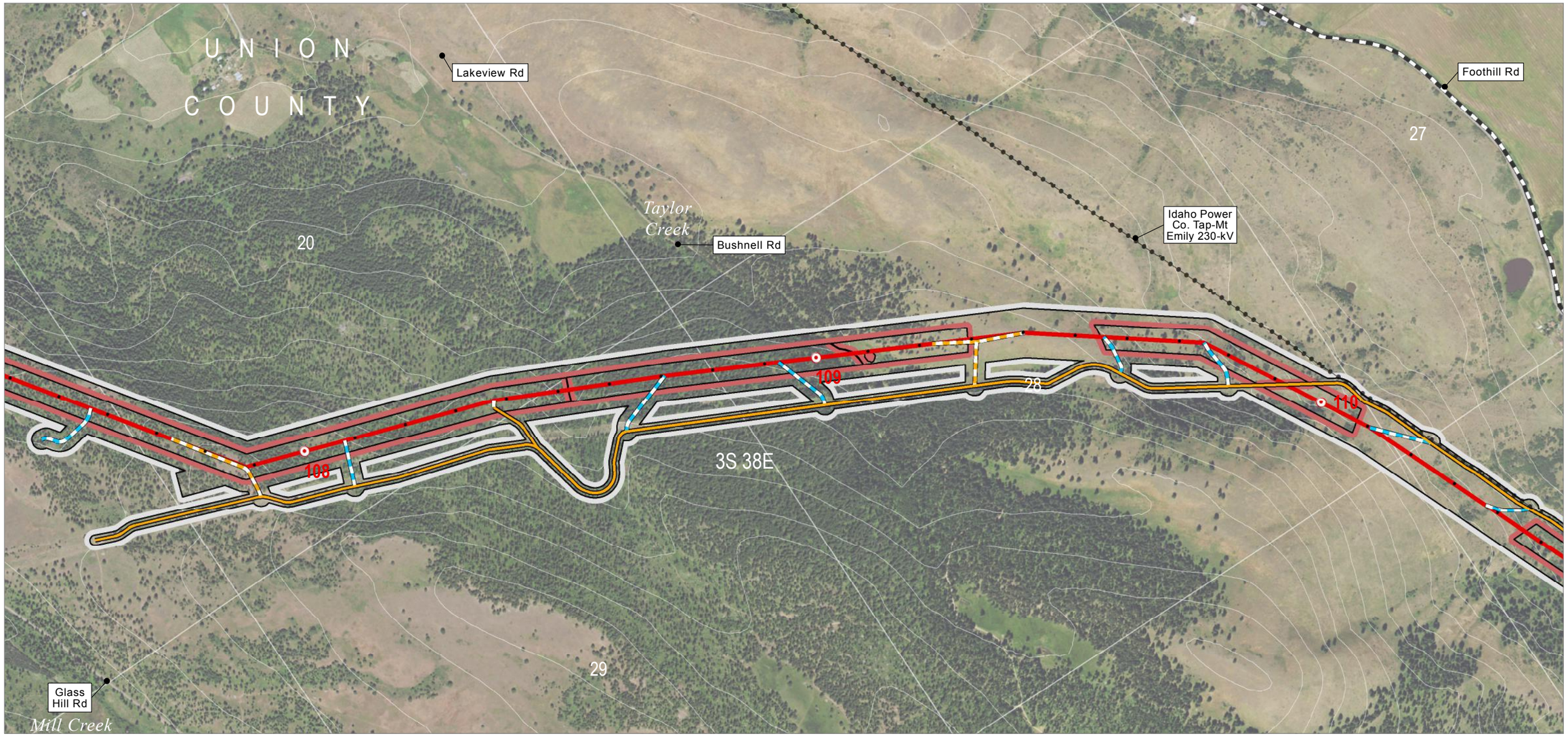
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 12



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Map Area

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

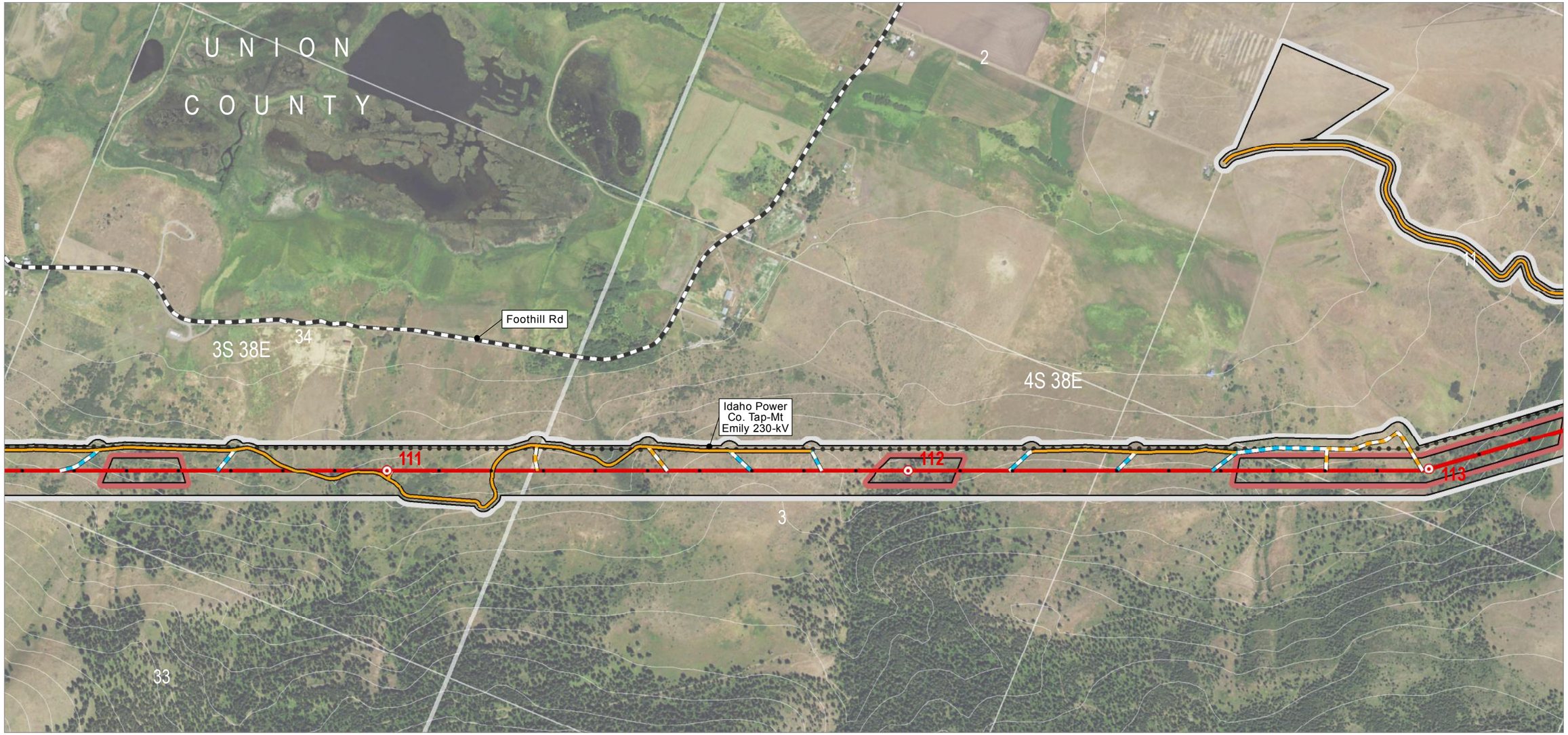
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 13



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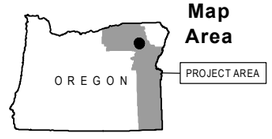
Map Area



Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads

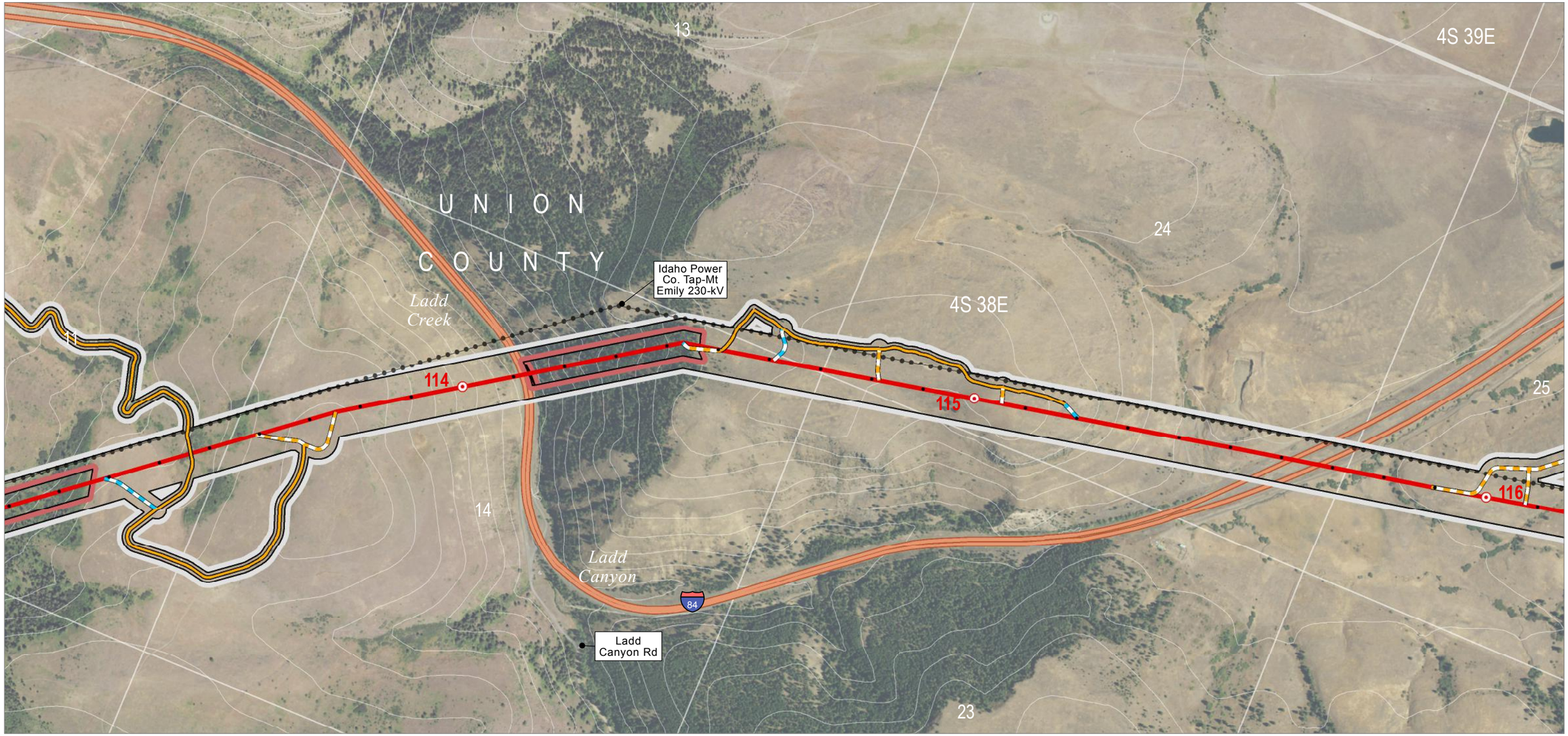
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 14



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Map Area
OREGON
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

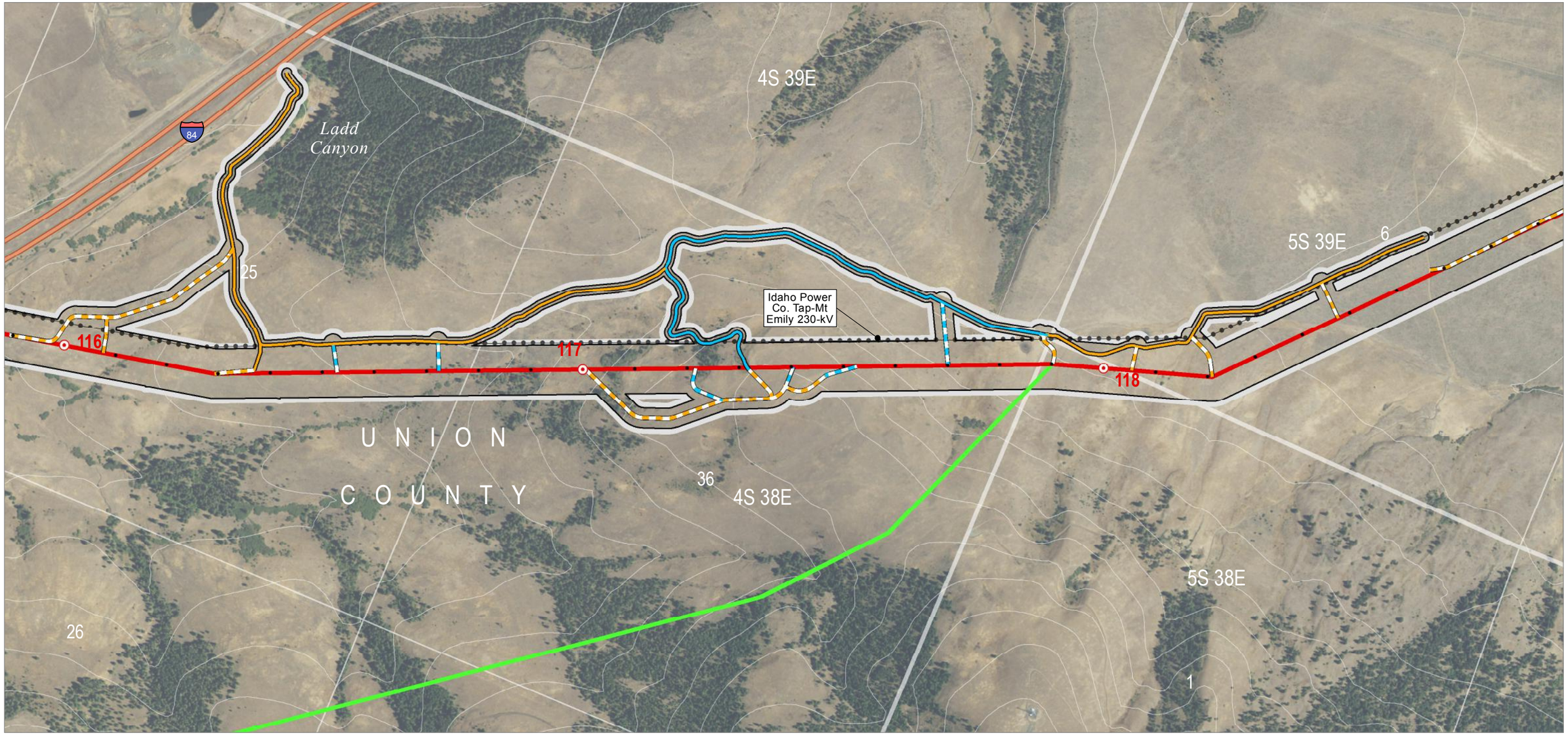
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 15



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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Project Features

Site Boundary
- Proposed Route

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

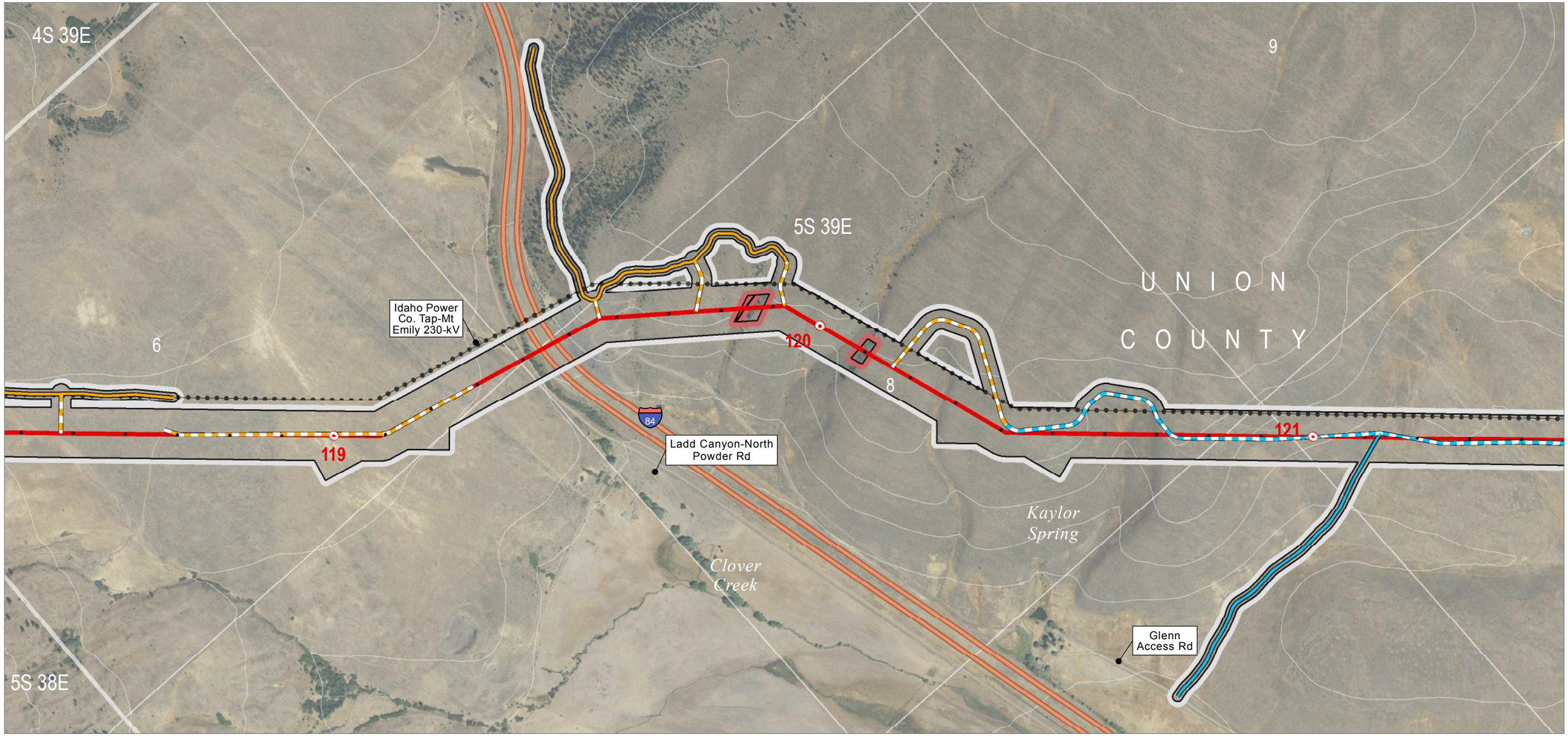
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 16



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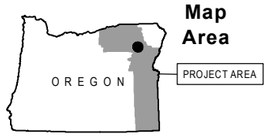
Map Area



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Project Features
- Site Boundary
  - Proposed Route
- Route Centerline
  - Proposed Route
- Mileposts
  - Mile
  - Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

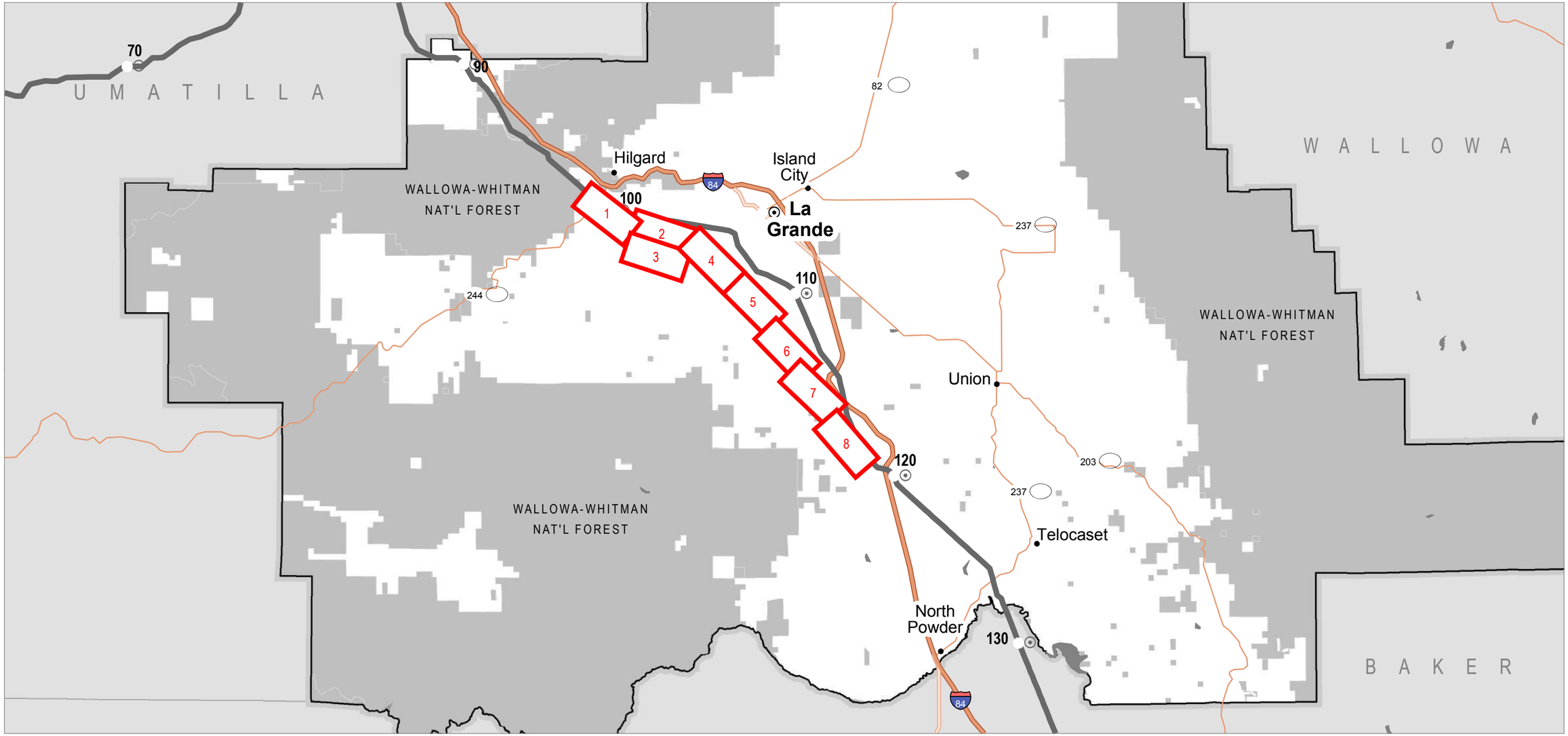
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Proposed Route
Union County

Map 17



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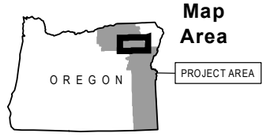
Map Area



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June 2017

Map Index
Location Map (Map #)

Project Features
Proposed Route
Ten-mile Marker

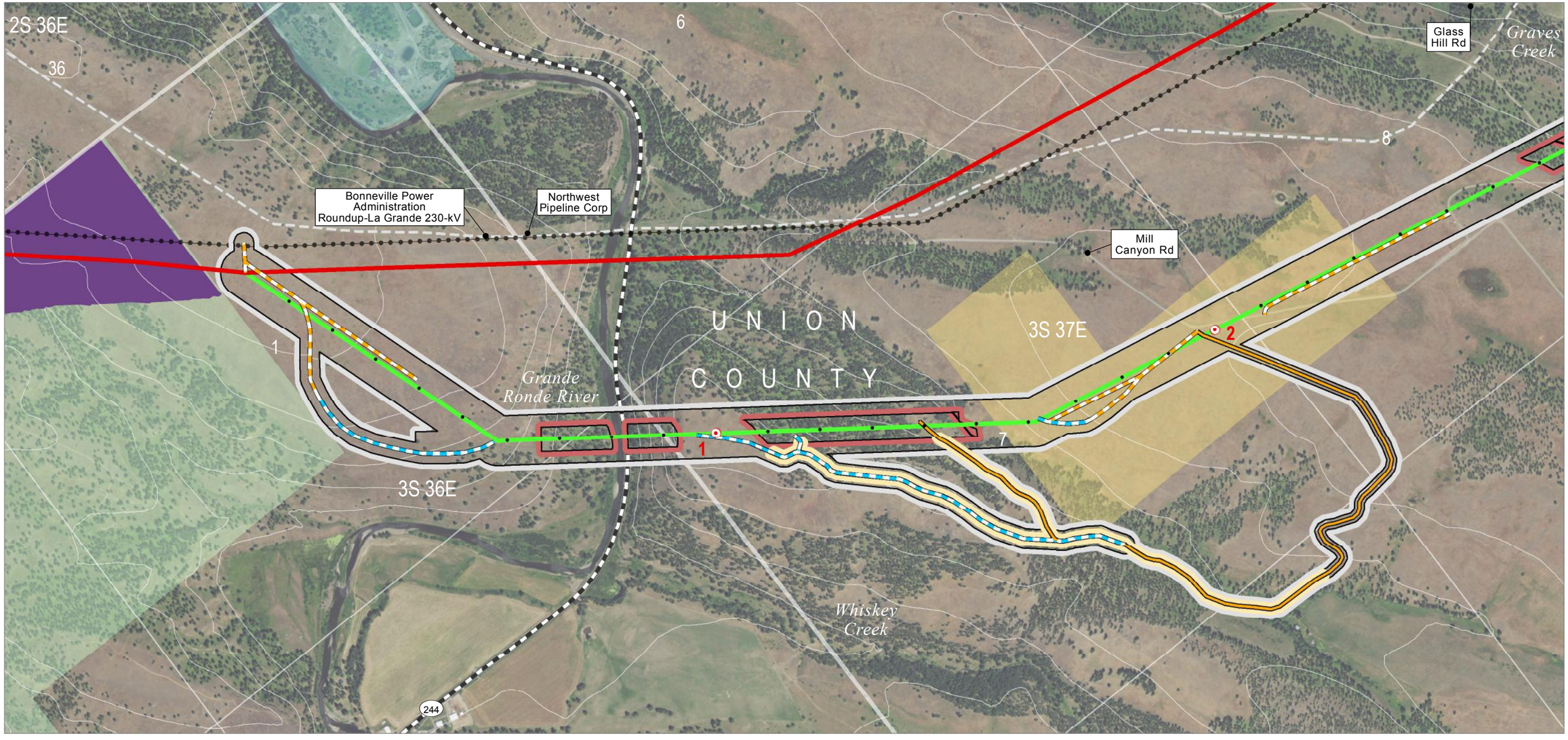
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-1
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map Index



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Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Bureau of Land Management
- Private
- State or Local Wildlife or Parks and Recreation Area
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Other Major Roads
- Designated Utility Corridor (BLM, Forest Service, or West-wide Energy)

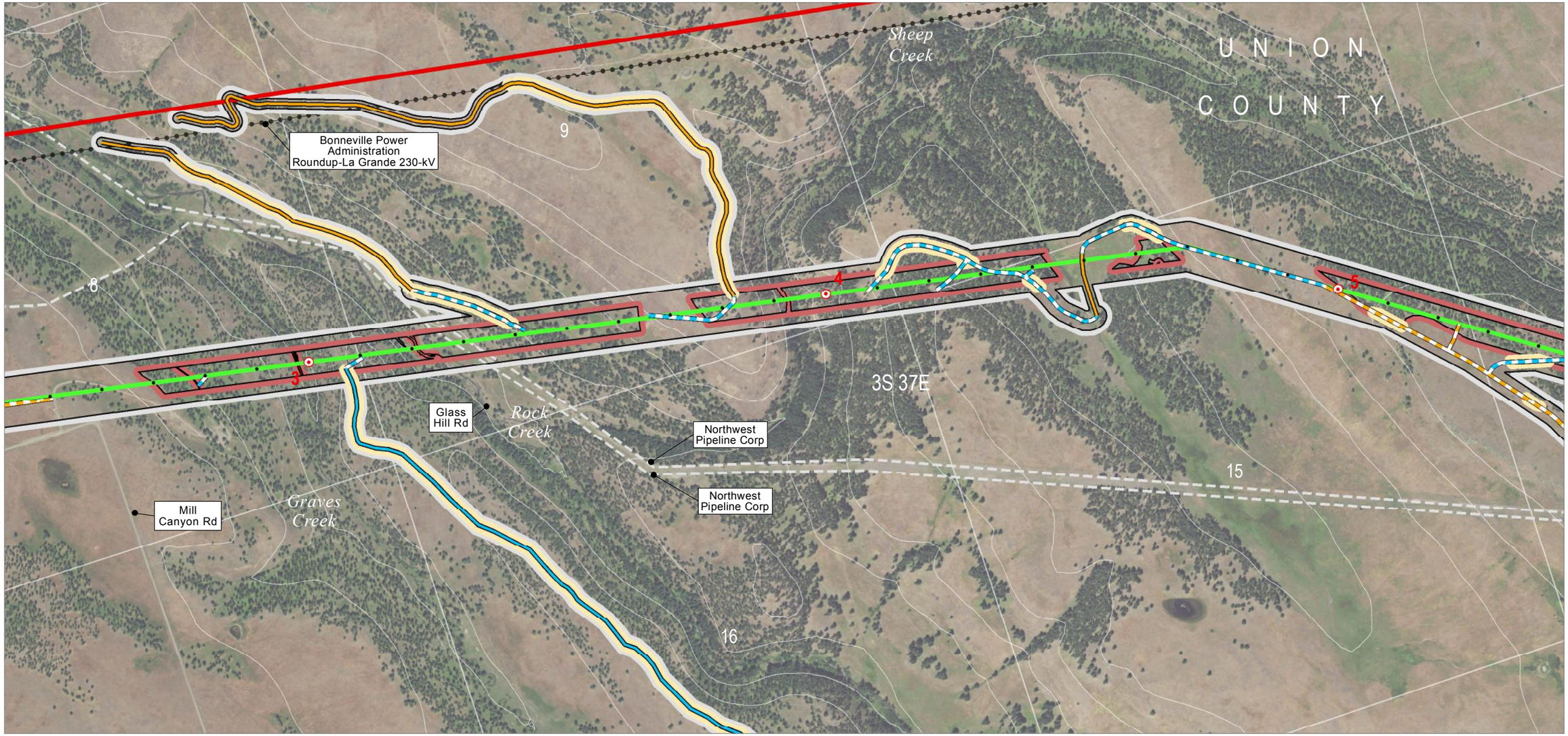
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 18



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Map Area

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 19

0 1,000
Feet

Map Area

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary

Alternative

Access

Existing Road, Substantial Modification, 71-100% Improvements

Estimated Forest Disturbance

Access Road Clearance

Land Status

Private

Important Siting Constraints and Other Features

100-foot Contours

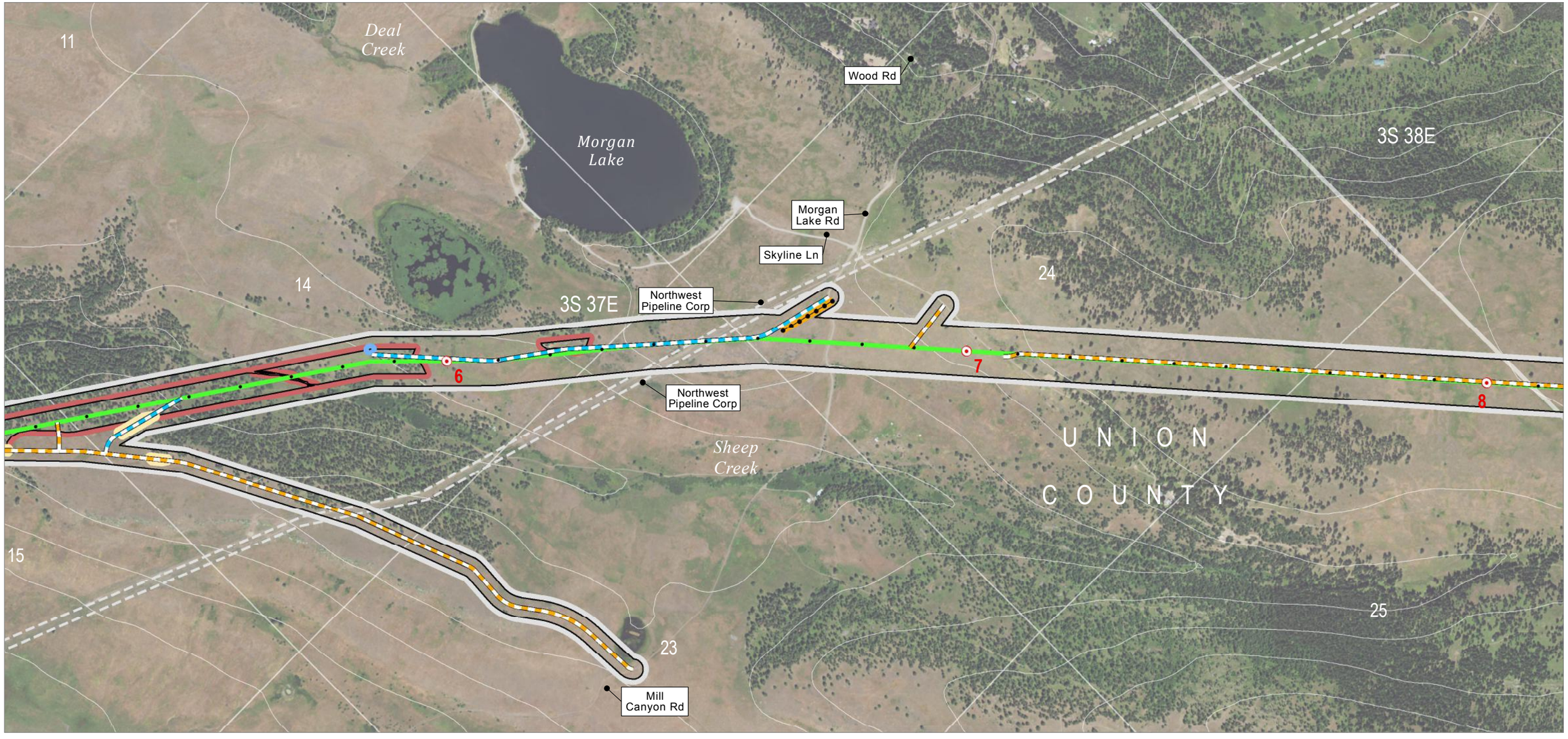
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 20



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Map Area

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- New Road, Bladed
- New Road, Primitive
- Distribution Line to Communication Station (IPC Service Territory Only)

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 21

0 1,000
Feet

Map Area
OREGON
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- Existing Road, Substantial Modification, 71-100% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours

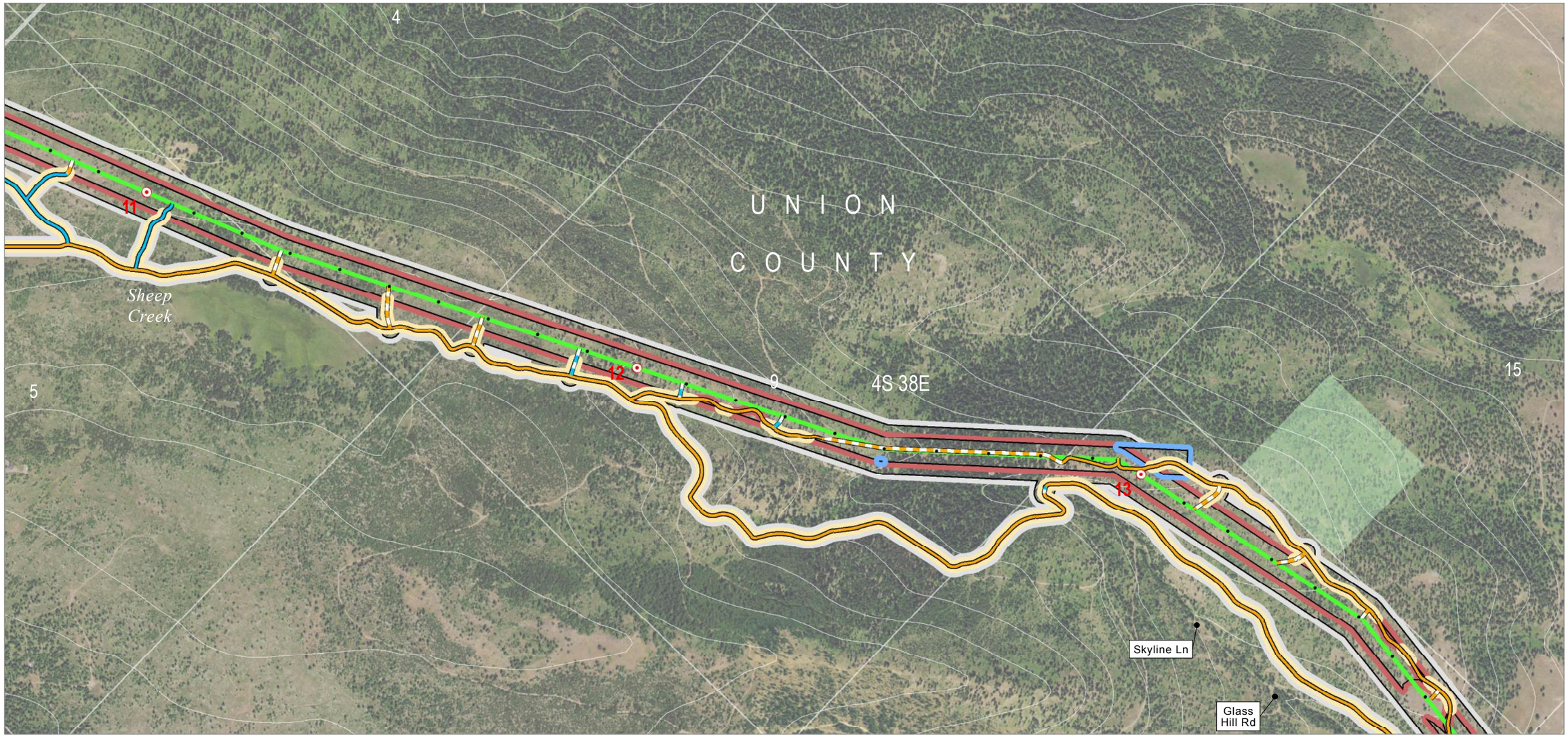
IDAHO POWER An IDACORP Company

Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 22



0 1,000
Feet

Map Area
OREGON
PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features
Site Boundary
Alternative
Route Centerline
Alternative
Mileposts
Mile
Tenth-mile

Access
Existing Road, Substantial Modification, 21-70% Improvements
Existing Road, Substantial Modification, 71-100% Improvements
New Road, Bladed
New Road, Primitive

Estimated Forest Disturbance
Right of Way Clearance
Access Road Clearance
Work Area Clearance

Land Status
Private
US Forest Service

Important Siting Constraints and Other Features
100-foot Contours

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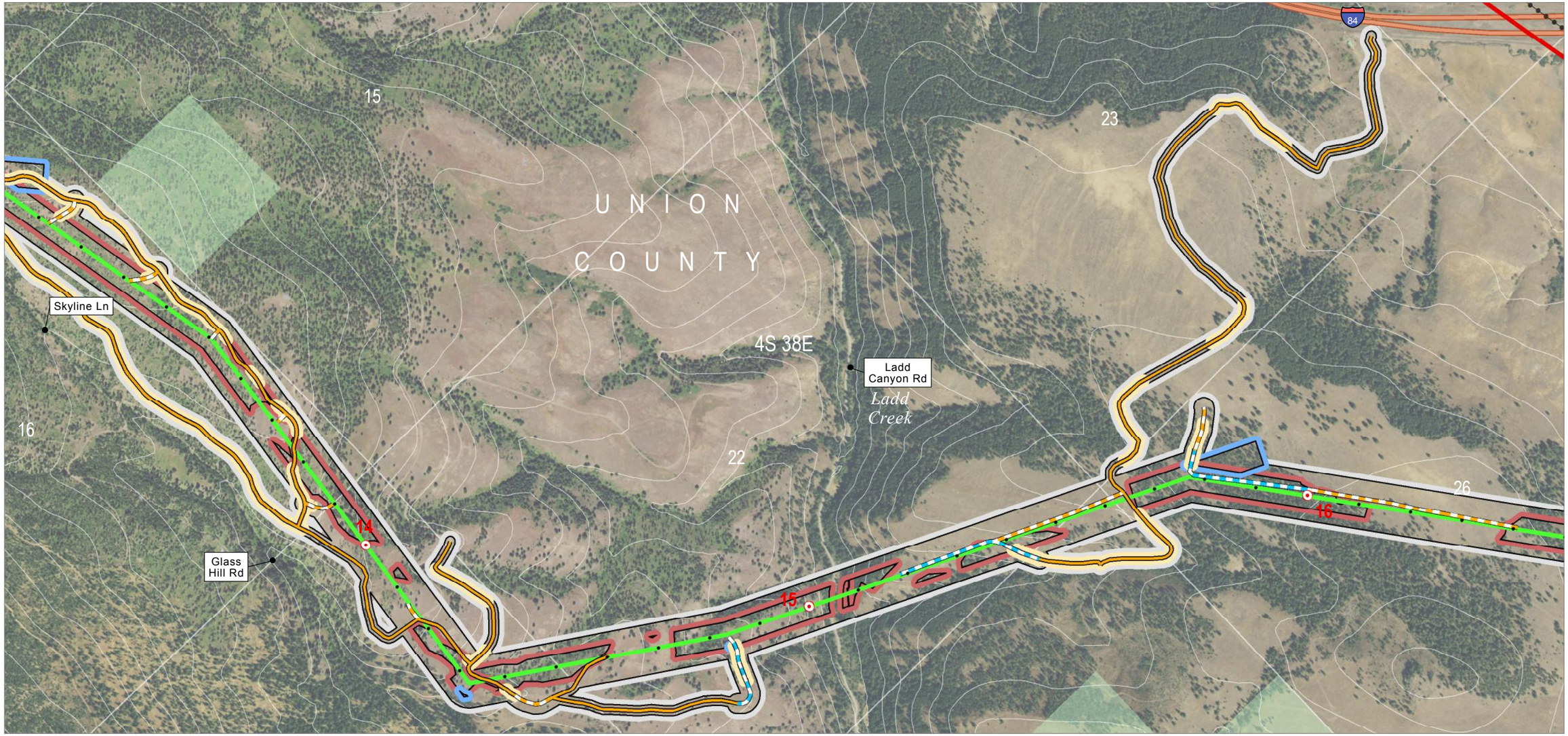
Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 23



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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- Existing Road, Substantial Modification, 21-70% Improvements
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance
- Work Area Clearance

Land Status
- Private
- US Forest Service

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines
- Interstates or Highways

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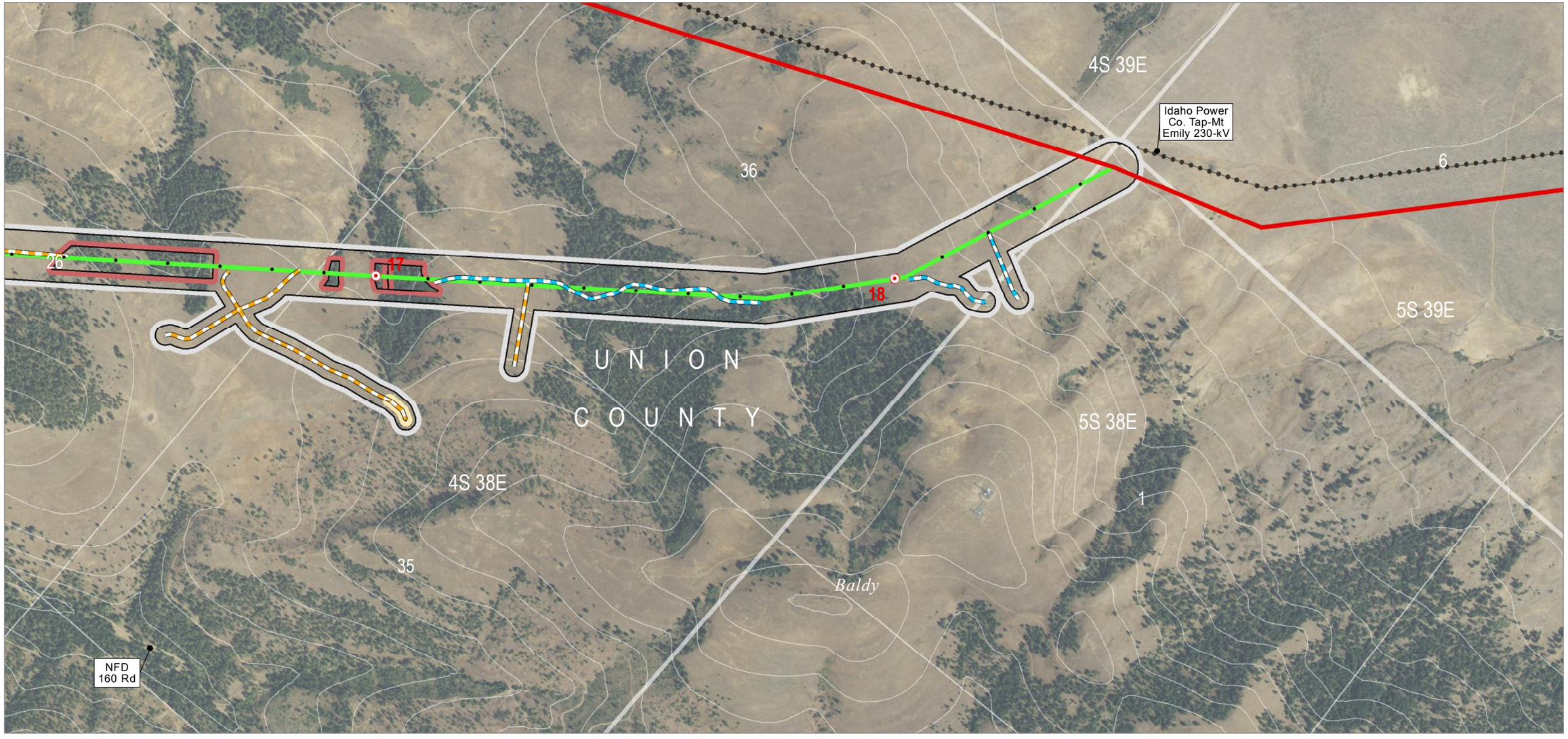
Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 24



0 1,000 Feet

Map Area

OREGON

PROJECT AREA

Source(s): BLM, IPC, ODFW, ODOT, NPS, USDA, USFS, USGS, Ventyx, Esri, DigitalGlobe, GeoEys, Earthstar Geographics, CNES/Airbus DS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo

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June 2017

Project Features

Site Boundary
- Alternative

Route Centerline
- Proposed Route
- Alternative

Mileposts
- Mile
- Tenth-mile

Access
- New Road, Bladed
- New Road, Primitive

Estimated Forest Disturbance
- Right of Way Clearance
- Access Road Clearance

Land Status
- Private

Important Siting Constraints and Other Features
- 100-foot Contours
- Existing Transmission Lines

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Boardman to Hemingway Transmission Line Project

Attachment BB-2
Estimated Forest Disturbance

Morgan Lake Alternative
Union County

Map 25

Attachment BB-2

Fish Passage Plans and Designs

ATTACHMENT BB-2
FISH PASSAGE PLAN

Fish Passage Plans and Designs

Boardman to Hemingway Transmission Line Project

Prepared for:

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February 2017

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Appendix C Design Drawings

ACRONYMS AND ABBREVIATIONS

ARBO II	Aquatic Restoration Biological Opinion II
DEM	Digital Elevation Model
ESA	Endangered Species Act
IPC	Idaho Power Company
kV	kilovolt
LiDAR	light detection and ranging
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
OAR	Oregon Administrative Rules
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ORS	Oregon Revised Statues
Project	Boardman to Hemingway Transmission Line Project
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

Idaho Power Company (IPC) is proposing to construct and operate a new, approximately 300-mile-long, single-circuit 500-kilovolt (kV) electric transmission line between northeast Oregon and southwest Idaho known as the Boardman to Hemingway Transmission Line Project (Project). The overhead, 500-kV transmission line will carry energy bi-directionally between the planned Longhorn Station near Boardman in Morrow County, Oregon, and IPC's existing Hemingway Substation, located in Owyhee County, Idaho (Figures 1a and 1b).

To support construction, operation, and maintenance of the Project, the engineering design includes the development of new access roads and improvement of existing roads. As documented in this report, some of this work will require road crossings of fish-bearing streams. These crossings may involve the design and construction of new crossing structures, modifications to existing structures, or use of existing structures with no improvements. Based on Oregon Administrative Rules (OAR) 635-412-0020, new construction affecting fish-bearing streams in Oregon will trigger fish passage rules and regulations and require review by the Oregon Department of Fish and Wildlife (ODFW). ODFW fish passage approvals may be obtained through preparation of a Fish Passage Plan meeting the requirements of OAR 635-412-0035 (see Section 2 for additional details). The purpose of this report is to outline the regulatory criteria and Fish Passage Plans and designs for those fish-bearing stream crossings by Project roads that are anticipated to require ODFW review.

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 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. Based on the review and analyses, seven crossing types were identified to assist in separating and grouping the potential alternatives identified for each site: 1) utilization of existing bridges; 2) utilization of existing culverts; 3A) installation of temporary bridge over existing structure; 3B) installation of temporary bridge adjacent to existing structure; 4) installation of temporary timber matting with seasonal restrictions; 5) utilization or improvement of existing fords; 6) installation of new arch or bottomless structure; or 7) installation of new bridge.

The project design team met with representatives of the ODFW and ODOE on October 28, 2014, to discuss the agencies' review of the Tetra Tech (2014) report. During the meeting, the applicable federal, state, and local design criteria and guidelines, as well as the identified crossing types and alternatives for the 18 fish-bearing road-stream crossing sites, were discussed. Crossing Type 1 or 2 was identified as the proposed alternative for 10 of the 18 sites. Based on OAR Chapter 635, Division 412, Fish Passage, these crossing sites were 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, 4, or 5 were selected as proposed alternatives for the remaining 8 crossing sites; these crossings were deemed likely to trigger ODFW review because they would require some new construction. Of these 8 sites deemed likely to trigger ODFW review, one crossing was subsequently identified for relocation to an alternative road that would not require a fish-bearing road-stream crossing. The removal of this crossing, along with the 10 sites that were not expected to trigger ODFW fish passage requirements, resulted in a total of 7 sites requiring ODFW review.

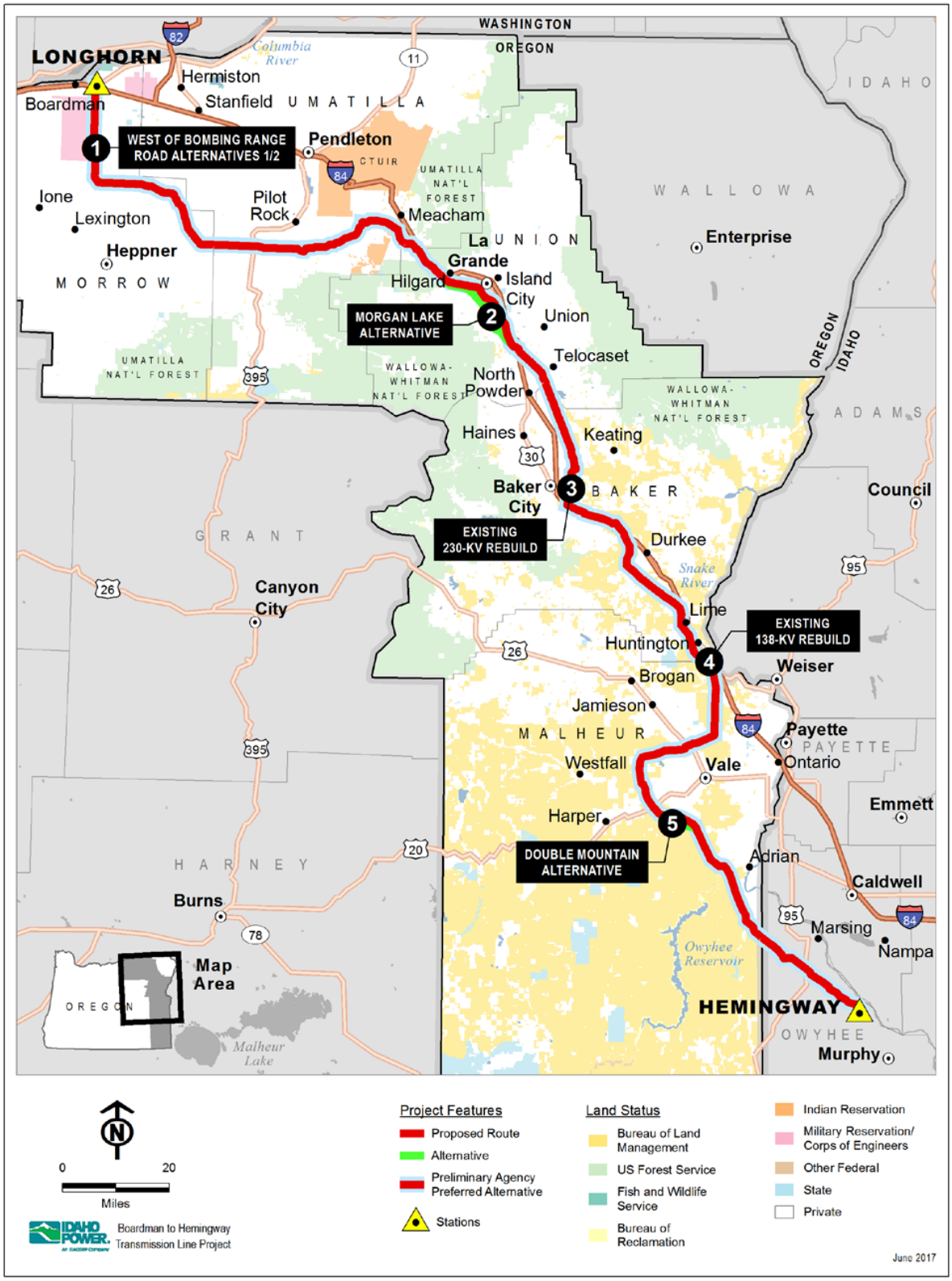

Figure 1a. Project Overview

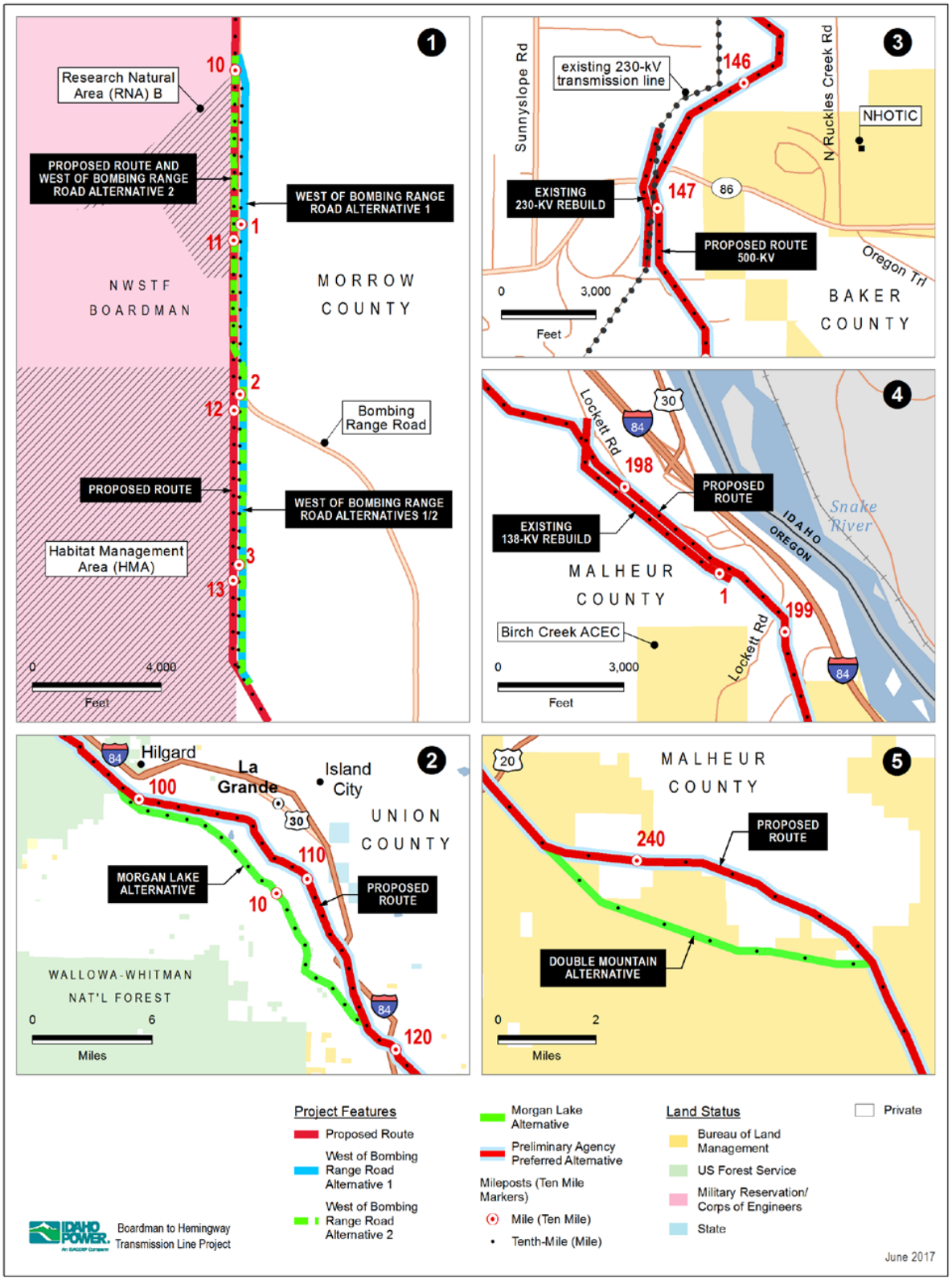

Figure 1b. Detail of Alternatives and 230-kV and 138-kV Rebuilds

In January 2015, the ODFW informed IPC they had reviewed and approved the results and analysis of materials in the Tetra Tech (2014) report, as well as the information presented at the meeting regarding identified proposed and alternative crossing types (Seidel personal comm. 2015a). As part of the approval process, IPC agreed to work with the ODFW in their review of Fish Passage Plans and design drawings for fish-bearing road-stream crossings to ensure that all designs satisfy the ODFW fish passage requirements.

In May 2015, IPC submitted to ODFW the original version of this report documenting the 18 total fish-bearing road-stream crossings, the 10 sites not expected to trigger ODFW review, the 1 crossing removed due to road relocation, and the Fish Passage Plans and designs for the 7 fish-bearing road-stream crossings that required ODFW review.

In June 2015, ODFW provided questions and comments (Seidel personal comm. 2015b) to IPC on the original report. Concurrent to receiving these questions and comments from ODFW, the engineering design associated with the development of new access roads and improvement of existing roads was modified.

This modification to the Project access roads added 2 fish-bearing road-stream crossing sites and removed 4 sites from those originally identified, reducing the total fish-bearing road-stream crossing sites from 18 to 16 (Tetra Tech 2015). Of the 16 sites, 10 were identified as Crossing Type 1 or 2 that utilize an existing bridge or culvert and are not expected to trigger ODFW fish passage requirements. Crossing Types 3A, 4, or 5 were identified for 5 of the 6 other fish-bearing road-stream crossings and would require ODFW review. The remaining site required a new Crossing Type, because the site is a new crossing that does not have an existing ford, culvert, or bridge present. This new Crossing Type, 3C, entailed installation of a temporary bridge over the new crossing location on Cavanaugh Creek (1-025) and would also require ODFW review.

The 4 sites that were removed from the 18 sites in the original report were Straw Ranch Creek (0-271), Unnamed Stream (0-130), Tributary to Ladd Canyon Creek (0-181), and Powell Creek (1-018). These removed sites are no longer included in the analysis and will not be discussed further in this report. The removal of these crossings, along with the 10 sites that were not expected to trigger ODFW fish passage requirements, resulted in a total of 6 fish-bearing road-stream crossing sites requiring ODFW review. In December 2015, ODFW reviewed and approved the Fish Passage Plans and design drawings for these 6 fish-bearing road-stream crossings. ODFW provided 6 unique fish passage approval numbers (PA-09-0016 to -0021), one for each crossing (see Appendix A).

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. Determination of fish-bearing streams and crossings were reported in the Fish Habitat and Stream Crossing Assessment Summary Report (Tetra Tech 2016). That report includes the evaluation of both the portions of the 2014 routes that are still being considered and the results from the recent (2016) surveys of 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. For crossing R-11312, an existing recycled railcar bridge for a private road, Crossing Type 3A, was identified as the proposed crossing type. This

crossing is deemed unlikely to trigger ODFW fish passage requirements as the temporary bridge can be placed on top of the existing bridge structure without any impact to the stream footprint.

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. Crossings R-65725 and R-68790 are also known as crossings 0-325 (ODFW approval number PA-09-0018) and 0-337 (ODFW approval number PA-09-0020), respectively, in the approved 2015 plans and designs. Proposed crossing types for the seven sites include conservation measures to minimize effects to aquatic environments. Utilization of these crossing structures would include conservation measures described in the Application for Site Certificate and applicable individual federal, state, or local environmental compliance requirements.

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Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s)[1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Little Butter Creek	R-08883	27.8	Private	Resident	Medium	Medium	Culvert	2	3A; 3B	4.7-foot corrugated metal pipe in place.	Culvert is under-sized with limited fill covering pipe. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-08916	27.9	Private	Resident	Medium	Medium	Bridge	1	–	90-foot steel I-beam with center support bridge in place.	--	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-11312	34.2	Private	Resident	Low	Medium	Bridge	3A	–	48-foot railcar bridge in place.	Bridge and abutments outside of the OHW could be replaced with similar railcar. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Butter Creek	R-17426	49.9	Private	Resident	Medium	Low	Bridge	1	–	30-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
West Birch Creek	R-20404	59.7	Private	Anadromous	Low	Medium	Bridge	1	3B	42-foot steel I-beam bridge in place.	Needs new decking, may need some structural support outside the OHW. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
East Birch Creek	R-20809	63.2	Private	Anadromous	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	A Major Road (asphalt road) crossing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
California Gulch	R-21694	64.1	Private	Anadromous	Medium	Low	NA;[2] Culvert	2	–	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
East Birch Creek	R-21604	64.2	Private	Anadromous	Low	Medium	Bridge	1	–	43-foot steel I-beam bridge in place.	Possibly some structural modifications outside the OHW. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Ray Creek	R-20492	65.9	Private	Resident	Low	Low	Culvert	2	–	3.5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed Stream [1185935454536] (previously Wood Hollow)	R-23502	75.5	Private	Resident	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
McKay Creek	R-23514	75.5	Private	Resident	Low	Medium	Bridge	1	–	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Two mile Creek	R-24303	83.2	Private	Anadromous	Low	Medium	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Two mile Creek	R-24242	83.3	Private	Anadromous	Low	Low	Culvert	2	–	4.6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1184504454902]	R-24656	83.8	Private	Anadromous	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing locations, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-24664	84.2	Private	Resident	Low	Low	Culvert	2	–	4-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-24814	84.3	Private	Anadromous	Low	Low	Bridge	2	–	21-foot steel I-beam with concrete decking bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Beaver Creek	R-25593	86.1	Private	Anadromous	High	High	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Dry Creek	R-29313	95.0	USFS	Anadromous	Low	Low	Bridge	1	–	36-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Grande Ronde River	R-31086	99.2	Private	Anadromous	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	A Major Road (asphalt road) crossing that would not be changed from project actions and does not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Whiskey Creek	R-31388	99.5	Private	Anadromous	Medium	Medium	Culvert	2	3A; 3B	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Rock Creek	R-31715	100.8	Private	Anadromous	Low	Medium	Bridge	2	3A; 3B	50-foot bridge with guard rails in place.	Privately owned existing bridge. Easterly approach angle (76 degrees) may be difficult for crane. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Little Graves Creek	R-32785	101.8	Private	Resident	Low	Low	Bridge	1	–	15-foot steel I-beam, wood plank bridge	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Graves Creek	R-32979	102.4	Private	Anadromous	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Little Rock Creek	R-33010	102.9	Private	Resident	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33011	102.9	Private	Anadromous	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33033	103.0	Private	Anadromous	Medium	High	NA[3] Ford	3A	–	No access to crossing location, but stream was surveyed.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Rock Creek	R-33147	103.2	Private	Anadromous	Medium	High	Ford[3]	3A	–	No maintenance and stream washed out bridge and road. Road ends at stream.	Utilize temporary bridge over existing ford with temporary/seasonal restrictions for use of crossing during Project operation and maintenance. Road improvements will be needed.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Sheep Creek	R-33628	106.4	Private	Anadromous	Medium	Medium	Culvert	2	–	3-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Mill Creek	R-34099	107.2	Private	Anadromous	Low	Medium	Culvert	2	–	3.3-foot concrete pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180502451927]	R-36299	112.9	Private	Resident	Low	Medium	Bridge	1	–	17-foot bridge with eco-block foundation, I-beams (12 inch, 4 total), and 8-inch by 8-inch pressure treated 12-inch by 4-inch planks in place.	Although the road width (10-foot) is narrow, the crossing is adequate for Project construction. Private road used for timber harvest. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Ladd Creek Pickup Ditch	R-37179	115.5	Private	Resident	Low	Medium	Bridge	1	–	31-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180496451929]	R-37369	115.9	Private	Resident	Medium	Medium	Bridge	1	–	19-foot steel girder bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-37969	116.3	Private	Resident	Medium	Medium	Culvert	2	3A; 3B	1.7-foot and 2-foot diameter corrugated metal pipes in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Unnamed stream [1180049451917]	R-38011	116.4	Private	Resident	Low	Medium	Culvert	2	–	4-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1] Proposed	Potential Crossing Type(s) [1] Alternatives	Crossing Type – Explanation	Considerations	
Unnamed Stream [1180266452136] (previously Ladd Canyon)	R-38059	116.5	Private	Resident	Medium	Medium	Culvert	2	–	4-foot diameter corrugated metal pipe in place.	Near existing residence. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Clover Creek	R-41281	124.1	Private	Resident	Low	Medium	Culvert	2	–	6.5-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Gentry Creek	R-44271	131.4	Private	Resident	Medium	High	Culvert	2	3A; 3B	2-foot diameter corrugated metal pipe in place.	May need to add fill above exiting culvert. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Alder Creek	R-56681	165.4	Private	Resident	Low	Low	Culvert	2	–	3-foot diameter corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Hill Creek	R-56890	166.1	Private	Resident	Medium	Medium	Culvert	2	–	2-foot diameter corrugated metal pipe in place.	Minor improvements needed including more fill placed above culvert and improve approaches both sides. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-59115	171.3	Private	Resident	Low	Medium	NA;[2] Bridge	1	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Powell Creek	R-59645	173.9	Private	Resident	Low	Medium	Culvert	2	–	6.5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-59830	174.3	Private	Resident	Low	Low	Bridge	1	–	100-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Burnt River	R-61345	178.0	Private	Resident	Low	Low	Bridge	1	–	94-foot concrete bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Shirttail Creek	R-61834	178.7	Private	Resident	Medium	Medium	Culvert	2	–	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Dixie Creek	R-64752	185.2	Private	Resident	Not Rated[2]	Not Rated[2]	NA;[2] Bridge	1	–	Good wide major road crossing with railing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Goodman Creek	R-65725	188.4	Private	Resident	High	Medium	Ford	3B	3A	There is an existing ford in place.	Use temporary bridge over ford with seasonal restrictions.	New construction or major replacement proposed. ODFW Fish Passage Plan approved in 2015 (see Appendix A).
Cavanaugh Creek	R-66818	190.7	Private	Resident	High	High	Ford	3A	3B	There is an existing ford in place.	Use temporary bridge over ford with seasonal restrictions.	New construction or major replacement proposed. ODFW Fish Passage Plan anticipated.
Cavanaugh Creek	R-66868	190.8	Private	Resident	Medium	Medium	Culvert	2	–	6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Durbin Creek	R-67679	192.8	BLM	Resident	Not Rated[2]	Not Rated[2]	NA;[2] Culvert	2	–	A Major Road crossing that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Benson Creek	R-68790	195.4	Private	Resident	Medium	High	Ford	3A	3B, 5	There is an existing ford in place.	Ford with high cattle use. Stream is sand/silt bed and of low quality. Utilize temporary bridge over existing ford.	New construction or major replacement proposed. ODFW Fish Passage Plan approved in 2015 (see Appendix A).
Benson Creek	R-69626	197.4	Private	Resident	Low	Medium	Bridge	1	–	Major highway bridge	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Table 1. Road-Stream Crossing Ownership, Risk Summaries, Proposed Crossing Types, and Fish Passage Information (continued)

Stream Name	Crossing ID	Nearest Proposed Route Milepost	Owner-ship	Fish Use	Risk Ratings		Crossing Characteristics					ODFW Fish Passage Trigger
					Stream	Project	Existing Crossing Type	Potential Crossing Type(s) [1]		Crossing Type – Explanation	Considerations	
								Proposed	Alternatives			
Cottonwood Creek	R-72465	226.8	Private	Resident	Medium	Medium	NA;[2] Culvert	2	3A; 3B	No access to crossing location, but stream was surveyed.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Poison Creek	R-92529	275.8	Private	Resident	Low	Low	Culvert	2	–	4.6-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Jump Creek	R-92884	277.8	Private	Resident	Medium	Medium	Bridge	1	3A; 3B	25-foot laminated wood bridge in place.	Bridge has 6-ton weight limit. No new construction or major replacement is needed.	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Jump Creek	R-93078	277.9	Private	Resident	Low	Medium	Bridge	1	–	28-foot steel bridge in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Squaw Creek	R-95383	283.3	Private	Resident	Low	Low	Bridge	1	–	24-foot span by 43-foot-wide box culvert/concrete bridge.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Hardtrigger Creek	R-97770	288.9	BLM	Resident	Medium	High	Culvert	2	–	5-foot corrugated metal pipe in place.	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.
Reynolds Creek	R-99900	294.1	Private	Resident	Not Rated[2]	Not Rated[2]	Culvert	2	–	A Major Road (asphalt road) crossing, with 3 culverts, that would not be changed from Project actions and not needing to be surveyed	–	No new construction or major replacement proposed. ODFW Fish Passage Plan not anticipated.

Note: Light green shading identifies those sites anticipated to trigger ODFW Fish Passage rules and are discussed in this report.

[1] Crossing Type (No.)/Description: 1. Utilize existing bridge; 2. Utilize existing culvert; 3A. Install temporary bridge over existing structure; 3B. Install temporary bridge adjacent to existing structure; 4. Install temporary timber matting with seasonal restrictions; 5. Utilize or improve existing ford; 6. Install new arch culvert or bottomless box structure; 7. Install new bridge.

[2] NA = No access; crossing type assumed or assessed from aerial photos.

[3] Primitive ford on private land.

BLM = Bureau of Land Management; OHW = Ordinary High Water; USFS = U.S. Department of Agriculture, Forest Service

2.0 REGULATORY CRITERIA

Summaries of regulatory requirements applicable to the seven crossing sites are presented below. Regulatory requirements specific to an individual road-stream crossing site are presented in Section 4.

2.1 Land Ownership and Criteria

The fish-bearing road-stream crossings for the seven sites along the Project being addressed in this report occur on private or county lands (Table 1). Therefore, only the regulatory criteria specific to private or county lands, as administered by the state, will be applicable at each site.

2.1.1 Federal Criteria

Snake River Basin steelhead (*Oncorhynchus mykiss*) are listed as threatened under the Endangered Species Act (ESA) (71 Federal Register 834) and were identified as present at three of the seven road-stream crossing sites requiring new construction or major replacement (Anadromous Fish Use, Table 1). Since these sites occur within federally designated critical habitat for steelhead, the National Oceanic and Atmospheric Administration, National Marine Fisheries Services (NOAA Fisheries) fish passage and stream crossing criteria apply. No other anadromous fish species or bull trout (*Salvelinus confluentus*) were identified as present at any of the seven sites; therefore, only the NOAA Fisheries criteria apply at the three sites where steelhead are present. Furthermore, none of the seven road-stream crossing sites are on federal lands and thus relevant fish passage or road-stream crossing design criteria for the U.S. Department of Agriculture Forest Service and U.S. Department of Interior Bureau of Land Management do not apply.

Proposed activities in waters of the United States require a permit from the federal government under the Clean Water Act (Section 404 Permit), which is administered by the U.S. Army Corps of Engineers (USACE). However, the Section 404 Permit does not itself establish stream crossing design criteria. In both Oregon and Idaho, the Section 404 Permit is issued in combination with state removal-fill permits under a Joint Permit Application (see Section 2.1.2.1).

2.1.1.1 National Oceanic and Atmospheric Administration, National Marine Fisheries Services

The three crossings of streams that contain ESA-listed steelhead will be designed according to guidelines developed by NOAA Fisheries. Specific criteria and guidelines required by NOAA Fisheries that are applicable for the Stream Simulation design method (NOAA Fisheries 2008) are as follows:

- **Channel width:** The minimum culvert bed width must be greater than bankfull width channel width, and of sufficient vertical clearance to allow ease of maintenance activities. If a stream is not fully entrenched, the minimum culvert bed width should be at least 1.3 times the bankfull width channel width.
- **Channel vertical clearance:** The minimum vertical clearance between the culvert bed and ceiling should be more than 6 feet.
- **Channel slope:** The slope of the reconstructed streambed within the culvert should approximate the average slope of the adjacent stream from approximately ten channel widths upstream and downstream of the site in which it is being placed, or in a stream reach that represents natural conditions outside the zone of the road crossing influence.

- **Culvert slope:** Closed bottom culvert slope should not exceed 6 percent for purposes of maintaining streambed integrity within the road crossing.
- **Embedment:** If a culvert is used, the bottom of the culvert should be buried into the streambed not less than 30 percent and not more than 50 percent of the culvert height, and a minimum of 3 feet. For bottomless culverts, the footings or foundation must be designed for the largest anticipated scour depth.
- **Maximum length of road crossing:** The length of the road crossing structure for streambed simulation for fish passage within a culvert should be less than 150 feet. If the length is greater than 150 feet, a bridge should be considered.
- **Fill materials:** Fill materials should comprise materials of similar size composition to natural bed materials that form the natural stream channels adjacent to the road crossing. The design must demonstrate long term stability of the passage corridor, through assessment of hydraulic conditions through the passage corridor over the fish passage design flow range, and through assessment of the ability of the stream to deliver sufficient transported bed material to maintain the integrity of the streambed over time. Larger material may be used to assist in grade retention and to provide resting areas for migratory fish.
- **Water depth and velocity:** Water depth and velocity must closely resemble those that exist in the reference reach. To provide resting zones, special care should be used to provide areas of greater than average depth and lower than average velocity throughout the length of the streambed simulation, reasonably replicating those found in the adjacent stream. Hydraulic controls to maintain depth at low flows may be required.

2.1.2 State Criteria

This section identifies design criteria for Project access roadways crossing fish-bearing streams located on private or county lands, as administered by the state. There are currently no identified fish-bearing stream crossings for the Project that occur on state lands in Oregon or Idaho. As noted above, all of the seven fish-bearing stream crossings being considered in this report occur on private or county lands in the state of Oregon and, as such, must meet the criteria described below, where applicable.

2.1.2.1 Oregon Department of State Lands

Oregon's Removal-Fill Law (Oregon Revised Statutes [ORS] 196.795-990) requires a permit for activities that remove or place fill material in waters of the state ("removal-fill permit"). The Oregon Department of State Lands issues the permit. "Waters of the state" are defined as "natural waterways including all tidal and non-tidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and non-navigable, including that portion of the Pacific Ocean that is in the boundaries of this state." The law applies to all landowners, whether private individuals or public agencies. The removal-fill permit, however, does not include specific stream crossing design criteria. The permit is issued in combination with the USACE under a Joint Permit Application.

2.1.2.2 Oregon Department of Fish and Wildlife

The ODFW regulates fish passage with regard to construction, major replacement, or abandonment of artificial obstructions for streams "in which native migratory fish are currently or were historically present" in waters of the state through OAR Chapter 635, Division 412, Fish Passage. Projects that construct, install, replace, extend, repair or maintain, and remove or abandon dams, dikes, levees, culverts, roads, water diversion structures, bridges, tide gates or

other hydraulic facilities are triggers to Oregon's fish passage rules and regulations. Additional clarification was provided by ODFW (2008a) on fish passage triggers and guidelines for bridges. "Construction" means both "original construction" and "major replacement," which specifically includes (as taken from OAR 635-412-0005):

> *For dikes, berms, levees, roads, or other artificial obstructions that segment estuaries, floodplains, or wetlands:*
>
> > *(i) activities defined under OAR 635-412-0005(9)(d) in all locations where current channels cross the artificial obstruction segmenting the estuary, floodplain, or wetland; or,*
> >
> > *(ii) the cumulative removal, fill, replacement, or addition of over 50 percent by volume of the existing material directly above an historic channel or historically-inundated area.*
>
> *For purposes of culverts, installation, or replacement of a roadbed or culvert, this is further defined as any activity that:*
>
> > *(i) creates a road which crosses the channel;*
> >
> > *(ii) widens a road footprint within a channel, or;*
> >
> > *(iii) fills or removes over 50 percent by volume of the existing roadbed material directly above a culvert, except when this volume is exclusively composed of the top 1 foot of roadbed material.*

When fish passage rules and regulations are triggered, ODFW provides the general requirements for fish passage under OAR 635-412-0035(1), and more specific requirements for various circumstances are listed under OAR 635-412-0035(2-11).

ODFW Fish Passage Plans

If fish passage rules and regulations are triggered, then, based on OAR 635-412-0020, ODFW fish passage approvals will be required, to be obtained by the following means:

> *(a) Individual approvals through a fish passage plan meeting the requirements of OAR 635-412-0035 for the specific artificial obstruction;*
>
> *(b) Programmatic approvals of multiple artificial obstructions of the same type if certain conditions in OAR 635-412-0020 (3)(b) are met; or*
>
> *(c) Pursuant to ORS 527.710(6), install and maintain road-stream crossing structures on non-federal forestlands in compliance with State Board of Forestry, through the Oregon Department of Forestry (ODF), rules and guidelines* [described in Section 2.1.2.3 below]*. These rules and guidelines require concurrence by the ODFW that they meet the purposes of the Department's fish passage program.*

2.1.2.3 Oregon Department of Forestry

The Oregon Department of Forestry (ODF) regulates forest practices on stream crossings for fish-bearing streams through the Forest Practices Administrative Rules, OAR Chapter 629, Division 625. Additional guidance is provided in Forest Practices Technical Note Number 4, Fish Passage Guidelines for New and Replacement Stream Crossing Structures (ODF 2002), which outlines six design strategies for providing fish passage. Stream crossing designs will comply with applicable portions of OAR Chapter 629, Division 625 and Forest Practices Technical Note Number 4 by

designing and constructing stream crossing structures (culverts, bridges, and fords) as outlined below:

- ***Embankment construction:*** *Minimize excavation of side slopes near the channel and minimize the volume of materials in fills to maximum of 15 feet in depth, as possible.*
- ***Erosion Control:*** *Prevent erosion of the fill and channel.*
- ***Passage requirements:*** *Allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs.*
- ***Channel slope:*** *Determine channel slope by measuring the longitudinal profile 200 feet upstream and downstream (400 feet total) of the crossing.*
- ***Structure width:*** *Effective width should be equal to or greater than the active channel width.*
- ***Fords:*** *Fords can be a preferred strategy because they reduce the amount of fill material placed in or adjacent to the active channel and result in the lowest level of channel disturbance during installation short of using a channel-spanning structure or abandoning the crossing entirely. In general, fords:*
  - *Should only be considered on small streams for low traffic roads that are private, gated, and have infrequent use. A reasonable measure of infrequent use is a level of traffic that does not cause a noticeable increase in turbidity (i.e., visible with the eye) that persists downstream of the crossing.*
  - *Fords are best suited when the stream channel has larger cobble and bedrock material exposed.*
  - *In designing a ford, the approaches should be at a 10 percent grade or less and hardened using coarse material (cobble and coarse gravel sized) for several hundred yards to allow the shedding of sediment as vehicles approach the crossing.*
  - *Drainage structures should be used to deflect water away from the stream approaches.*
  - *If the ford is hardened using cobbles in the stream, impermeable geotech fabric may need to be used to keep water on the surface so the ford does not become de-watered and impede fish passage.*
- ***Temporary stream crossing structures:*** *Temporary stream crossing structures may be used under the following conditions:*
  - *Crossing a landslide;*
  - *On slopes greater than 60 percent;*
  - *Adjacent property owner/road alignment restrictions;*
  - *To avoid using parallel roads/trails within 100 feet of the stream; and*
  - *Only alternative is a permanent crossing.*

  Temporary stream crossing structures may include fords, culverts, or bridges and must adhere to the following criteria:
  - *Straightening or shortening any stream channel is not permitted.*
  - *The crossing must be capable of passing the highest flow reasonably expected during the life of the structure, and without ponding water behind the fill or saturating fill soils.*

- *A single channel that is narrow and not deeply incised should be chosen.*
- *Multiple, braided, or side channels, eroded areas, or streambanks with exposed soils should be avoided.*
- *Banks should be less than 5 feet high. Bridges should be used where banks are higher.*
- *Rock, cobble, or gravel rather than clays, decomposed granite soils, or sand should be utilized while avoiding very wet or weak soils slide areas, gullies, or active erosion areas.*
- *The crossing should be approached at right angles and transitioned away from the stream as quickly as possible.*
- *The crossing must withstand erosion by the stream and minimize sedimentation.*
- *The crossing should maintain fish passage on Type F (fish-bearing) streams.*
- *Operators shall remove temporary stream crossing structures promptly after use, prior to seasonal runoff, and construct effective sediment barriers at approaches to channels.*

2.1.3 Local Jurisdiction Criteria

Local requirements (Baker, Malheur, Morrow, Owyhee, and Union counties) do not result in any changes to design decisions at any of the crossing locations due to the utilization of more stringent state design criteria.

2.2 Relevant Codes

The Project road-stream crossings will be designed to standards defined by federal, state, and local jurisdictions. The standards and guides to be used are listed in the subsections below.

2.2.1 Federal Codes and Standards

- Anadromous Salmonid Passage Facility Design (NOAA Fisheries 2008)
- Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (USDOT 2003)

2.2.2 State Codes and Standards

- ORS 509.580 through 509.910: Fish Passage; Fishways; Screening Devices; Hatcheries Near Dams
- OAR 635-41-0005 through 635-412-0040: Fish Passage
- Oregon Forest Practice Administrative Rules and Forest Practices Act, OAR Chapter 629 (ODF 2014)
- Forest Practices Technical Note Number 4, Fish Passage Guidelines for New and Replacement Structures (ODF 2002)

For construction specifications, the Project will utilize the federal projects standard specifications of the U.S. Department of Transportation noted in Section 2.2.1, with the Oregon Department of Transportation Department supplements:

- Oregon Standard Specifications for Construction (ODOT 2008)

2.2.3 Other Codes and Standards

Other recognized standards will be used where required to serve as guidelines for the design, and when not in conflict with the standards listed in Sections 2.2.1 and 2.2.2 above. In addition, all road components at stream crossings will be designed for HL-93 loads (AASHTO 2003).

3.0 DESIGN CRITERIA AND APPROACH

This section provides design criteria developed for fish-bearing road-stream crossings associated with the Project, a general description of the crossing types associated with the seven fish-bearing road-stream crossing sites, and the process followed in creating the crossing designs.

3.1 Design Criteria

The design criteria for fish-bearing road-stream crossings associated with the Project were developed based on the regulatory criteria presented in Section 2. Site-specific adjustments to the design criteria were applied to each of the seven crossing sites to minimize construction impacts (i.e., adverse effects to water quality and instream aquatic habitat, upstream fish passage, streambank stability, and riparian vegetation) at each location. Site-specific construction and seasonal timing restrictions for each of the seven crossing sites were identified as part of the design criteria. The design criteria include:

- Loading rate for temporary crossings is the AASHTO (2003) HL-93 truck load. If the Contractor selects different construction equipment, structural details and strength requirements of temporary crossings should be verified.
- Single-span structures will maintain a clear, unobstructed opening above the general scour elevation that is at least as wide as 1.5 times the active channel width, whenever feasible. Active channel width is defined as the stream width measured perpendicular to stream flow between the ordinary high water lines, or at the channel bankfull elevation.
- Minimum road width ingress/egress for the crossings is 10 feet.
- For each crossing site, construction and seasonal timing restrictions will be identified based on the following considerations:
  - Construction approach necessary for the installation of the proposed structure;
  - Construction and use of the seven crossing sites would occur at various times throughout the Project timeline and for varying durations, requiring crossing materials be specific to a site rather than being used and transported to all crossing sites (for instance, a temporary bridge).
  - Construction requirements of the structure;
  - Fish windows and upstream passage;
  - Seasonal use of the structure;
  - Duration of structure use (e.g., 3 months versus 1 year);
  - Crossing type needed for Project operations and maintenance once the structure is removed after construction; and
  - Estimated site hydrology and hydraulics.
- Effective erosion control measures and sediment barriers for the road approaches to the various channel crossings will be consistent with those previously identified in the 1200-

C Permit Application for the Project, contained within Exhibit I, Soil Protection, of IPC's Application for Site Certificate.

3.2 Crossing Structure Types

The design process began with assigning a potential crossing structure type for each of the crossing sites. The seven crossing sites include three with existing fords (sites R-65725, R-66818, and R-68790) and four with what has been assumed to be washed-out primitive ford crossings (site R-33010 on Little Rock Creek and sites R-33011, R-33033, and R-33147 on Rock Creek) for which a temporary bridge crossing is proposed (Table 1). Individual site considerations are noted under the "Considerations" column of Table 1.

Out of the eight potential crossing types mentioned in Section 1, two are being considered as options at the seven road-stream crossings discussed in this report: Types 3A and 3B. In addition, Type 5 is offered as an alternative option for crossing R-687901. General descriptions of each of these crossing types are presented below. Site-specific details for the proposed options are provided in Section 4.

Type 3A – Install Temporary Bridge Over Existing Structure

Crossing Type 3A involves placing a temporary bridge over an existing structure (e.g., other bridge, culvert, or ford). Temporary crossings, when assessed over the long term, can have the least effect on stream processes and fish habitat. There are short-term impacts associated with their construction and removal, but these can be minor when compared to the potential impacts caused by a permanent structure, associated maintenance, and potential failure. Temporary bridges are the most efficient stream crossing option for keeping sediment and equipment out of the channel, and can be constructed out of various materials such as timber, railroad cars, railroad ties, logs, steel, or pre-stressed concrete. Temporary bridges will be used on steeper channel gradients, deep water streams, where channel spans are larger, or where stream banks are steep or highly erodible, and where the use of Type 5 structures (see below) would not be feasible.

Type 3B – Install Temporary Bridge Adjacent to Existing Structure

Crossing Type 3B involves placing a temporary bridge adjacent to an existing structure (e.g., other bridge, culvert, or ford). As with the Type 3A crossings, Type 3B crossings, when assessed over the long term, can have the least effect on stream processes and fish habitat. There are short-term impacts associated with their construction and removal, but these can be minor when compared to the potential impacts caused by a permanent structure, associated maintenance, and potential failure. Temporary bridges are the most efficient stream crossing option for keeping sediment and equipment out of the channel, and can be constructed out of various materials such as timber, railroad cars, railroad ties, logs, steel, or pre-stressed concrete. Temporary bridges will be used on steeper channel gradients, deep water streams, where channel spans are larger, or where stream banks are steep or highly erodible.

Type 5 – Utilize or Improve Existing Ford

Crossing Type 5 involves utilizing or improving existing fords. Fords are low-water crossings best suited for short-term use on small streams during low-flow periods and should be used when water depths are less than 1 foot. An existing ford may be utilized when a firm rock base is present; otherwise, fords should be improved by removing soft soils and replacing them with crushed rock. The location of a ford should be in a straight, shallow stream reach, with gentle side slopes and approaches. Rocked fords with imported rock may require 12 inches or more of excavation to embed the rock and regrading back to original bed elevation and stream cross-section shape.

Stream gradient and natural channel shape are maintained. Placed rock is sized to reduce stream velocity and erosion and allow for heavy equipment use. The rock mixture may require the addition of up to 20 percent fines to facilitate traffic stability and maintain water at the surface.

3.3 Design Process

After the initial crossing type was identified for a given site, the process outlined below was followed in developing the design. The process was iterative in order to identify the most effective option for a given site and followed applicable regulatory criteria and guidelines described in Section 2.

- Reviewed field survey site data for each crossing from field surveys;
- Estimated hydrologic characteristics for design flows;
- Utilized existing ground surface from available light detection and ranging (LiDAR) or digital elevation model (DEM) topographic data;
- Estimated channel centerline from upstream to downstream;
- Created profile and sections for existing stream based on LiDAR or DEM surface for crossing location;
- Applied field data to determine upstream and downstream bankfull widths and channel gradients;
- Applied field data to determine dominant substrate material from field surveys;
- Developed designs of the proposed channel bed profile through the stream crossing;
- Identified and evaluated potential structures based on stream bed, bankfull width, embedment guidelines, and channel incision;
- Checked the suitability of the structure and evaluated other potential structure configurations against impacts to aquatic resources, scale, use, and cost; and
- Evaluated designs to determine if ODFW Fish Passage Plans would be required.

Section 4 provides the detailed results for each site from this design process.

3.4 Potential Future Actions

If additional modification to transmission and road routes require the development of new access roads that create stream crossings over fish-bearing streams not identified in the Tetra Tech (2016) report, or if additional stream crossings are discovered during the construction phase, then the following general procedures must be completed:

- If specified by the jurisdictional agency, channel-spanning structures will be designed and constructed to cross waterbodies identified as containing a sensitive fish species. The channel-spanning structures will include installation of a large-diameter culvert, arch culvert, or short span bridge with a stable road surface established over the structure for vehicle passage. Channel-spanning structures will be designed and installed under the guidance of a qualified engineer who, in collaboration with a hydrologist and aquatic biologist, will recommend placement locations; structure gradient, height, and sizing dimensions; and proper construction methods.
- At a minimum, new stream crossings on fish-bearing streams must adhere to ODFW and Idaho Department of Fish and Game fish passage design standards. The Project will adhere to ODFW fish passage designs and to design features similar to the Agency

Operating Procedures identified in the Programmatic Biological Opinion for Aquatic Restoration Activities in the States of Oregon and Washington (ARBO II) (USDC 2013).

- For culvert replacements or new culvert installations on all fish-bearing streams, Project design criteria will include associated work area isolation and fish salvage prior to any new construction. If listed species are involved, the NOAA Fisheries and ARBO II Agency Operating Procedures will apply.
- Stream crossings and in-water work will follow preferred work periods outlined in the ODFW (2008b) Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources. Crossings will be reviewed with ODFW and follow the Fish Passage Plans and designs documented for this Project.
- Routine and corrective operations and maintenance activities in streams with listed fish species will be conducted within the designated in-water work windows for each particular stream.
- Additional crossings will not be created without prior agency permitting and approval.

4.0 DESIGN DESCRIPTIONS FOR INDIVIDUAL CROSSINGS

The designs for each of the seven crossing sites were used to evaluate existing and proposed site-specific information and estimates of materials and removal or fill quantities for each crossing. Site-specific data from field surveys conducted in May 2014, June 2016, and August 2016 were used to develop each of the designs. Those data included site characteristics such as bankfull widths, stream gradient, bed material composition, and other field-collected data and are included in the individual ODFW Fish Passage Plans presented in Appendix B. LiDAR or DEM data were used to develop the site topography used in each design. Due to the coarse accuracy of the 1/3 arc-second (10-meter) and 1 arc-second (30-meter) resolution DEMs, assumptions of the topography based on site visits were incorporated into the designs. Design drawings for each site, together with general design and erosion control information, are provided in Appendix C.

Because available topography was used to develop the designs, further refinements to the designs may be necessary during final Project design. Designs for erosion control details (see Drawing G-002 in Appendix C) are based on the 1200-C Permit Application mentioned in Section 3.1 and descriptions provided below.

4.1 Existing and Proposed Crossings

4.1.1 Little Rock Creek, Site R-33010

4.1.1.1 Existing Conditions

The crossing at site R-33010 is a proposed (new) crossing (see Drawing C-101 in Appendix C) and was not surveyed due to lack of access; however, a desktop review of aerial imagery shows a primitive ford and unimproved road on private land. To develop the proposed (new) crossing, data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 19 feet and stream gradient at 3 percent upstream and 2 percent downstream of the crossing. Based on an analysis of a crossing near the site (see site R-33147), the stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is on private land and, based on aerial imagery, appears to be less than 10 feet wide.

4.1.1.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Although no stream gage data are available for this site, nearby stream gages show the high-flow discharges occurring between February and June. Therefore, all activities at this site would be restricted to July through January. The expected stream flows for the site during the low-flow period are expected to be less than a few cubic feet per second.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 19 feet from aerial imagery.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 3 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Access was not available to the crossing site. Due to the existing road's poor condition, narrow width, and washed-out crossing, a new road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) roadway was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.1.3 Proposed Crossing Type Description

Drawings C-102 and C-103 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock,

gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – A temporary bridge would be placed as perpendicularly as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 1 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed temporary bridge. If this occurs, maintenance to the temporary bridge would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.2 Rock Creek, Site R-33011

4.1.2.1 Existing Conditions

The crossing at site R-33011 was not surveyed due to lack of access. A desktop review of aerial imagery, however, showed a primitive ford crossing on a private road (see Drawing C-201 in Appendix C). Data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 20 feet and stream gradient at 2 percent both downstream and upstream of the crossing. Based on an analysis of a crossing near the site (see site R-33147), the stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles

(40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.2.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Although no stream gage data are available for this site, nearby stream gages show the high-flow discharges occurring between February and June. Therefore, all activities at this site would be restricted to July through January. The expected stream flows for the site during the low-flow period are expected to be less than a few cubic feet per second.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet from aerial imagery.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the existing road's poor condition, narrow width, and washed-out crossing, a new road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.2.3 Proposed Crossing Type Description

Drawings C-202 and C-203 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.

- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed temporary bridge. If this occurs, maintenance to the temporary bridge would be needed, with all activities that are within the wetted channel restricted to the in-water work window
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.3 Rock Creek, Site R-33033

4.1.3.1 Existing Conditions

The crossing at site R-33033 was not surveyed due to lack of access. A desktop review of aerial imagery, however, showed a washed-out bridge crossing (see Drawing C-301 in Appendix C). Data used in the design assumptions included aerial imagery, along with 10-meter resolution LiDAR. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 20 feet and stream gradient at 2 percent both downstream and upstream of the crossing. Based on an analysis of crossing near the site (see site R-33147), the stream bed

materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.3.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; no fish observed, crossing not surveyed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the existing road's poor condition, narrow width, and washed-out crossing, a complete road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.3.3 Proposed Crossing Type Description

Drawings C-302 and C-303 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.4 Rock Creek, Site R-33147

4.1.4.1 Existing Conditions

Data used in the design assumptions included field surveys conducted in August 2016, along with 10-meter resolution LiDAR. Proposed road and existing stream profiles were based on those data (see Drawing C-401 in Appendix C). Channel bankfull width was measured at 20 feet for the channel at the crossing location, and stream gradient was measured at 2 percent both downstream and upstream of the crossing. Stream bed materials consist of a mix of boulders, cobbles, gravels, and fines, with cobbles (40 percent) listed as the dominant substrate. The existing road is less than 10 feet wide and on private land.

4.1.4.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July 1 to October 15), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional Project construction (e.g., 3 years). The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; no fish observed.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 15).
- **Channel Width** – Bankfull width measured at 20 feet.
- **Channel Confinement** – Unconfined at the crossing and moderately confined locally (3- to 4-foot banks).
- **Stream Gradient** – 2 percent at and upstream of the crossing and 2 percent downstream of the crossing.
- **Road Ingress/Egress** – Due to the poor condition of the existing road, narrow width, and washed out crossing, a complete road and stream crossing improvements would be necessary.
- **Proposed and Alternative(s) Selected** – A temporary bridge with seasonal restrictions (Type 3A) was considered to be the most viable option for this crossing location. Benefits would include decreases in turbidity and overall reductions in channel bed and bank disturbance. Other alternatives identified for this crossing included improving the existing crossing to an armored ford (Type 5). Under this scenario, local turbidity would continue to be a problem at this location despite improvements to the ford.

4.1.4.3 Proposed Crossing Type Description

Drawings C-402 and C-403 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 38 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.

- **Arrangement** – Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The existing crossing gradient at the crossing is 2 percent. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 15). The proposed crossing must be removed from February to June due to higher flows in the stream. If Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window. If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window.
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, timber matting or a temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary structure (i.e., timber matting or temporary bridge) would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridge with seasonal restrictions are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.5 Goodman Creek, Site R-65725

4.1.5.1 Existing Conditions

The existing crossing at site R-65725 is an existing primitive ford crossing (see Drawing C-501 in Appendix C). Data from a field survey were used in the design, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Based on field measurements downstream, the channel bankfull width was 8 feet. Stream gradient at the site was measured at 5 percent upstream of the crossing and 9 percent downstream. Stream bed materials consist of sands (80 percent) and gravels (20 percent). The channel at the downstream survey site was nearly dry at time of field surveys. The existing road is 10 feet wide and on private land.

4.1.5.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be for the duration of Project construction activities (e.g., 3 years), with heavy machinery and four-wheel-drive vehicle use primarily between June and February. Installation of the crossing would be restricted to the in-water work window (July 1 to October 31), with no restrictions on Project use while the crossing is in place. The crossing would be permanently removed following Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second to dry, during periods of use.
- **Fish Presence** – Identified as fish-bearing; fish were not observed during field surveys.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 31).
- **Channel Width** – 8 feet wide at the crossing.
- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – 5 percent upstream of the crossing and 9 percent downstream of crossing.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge adjacent to the existing ford (Type 3B) was chosen as the proposed alternative based on the tight turning radius and steep gradients in the existing ford. Seasonal restrictions on use would require that crossings would only be used during low-flow conditions. The temporary bridge would result in decreases in turbidity and the least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered but would be problematic due the steep channel gradient that would make leveling of the crossing for vehicle traffic difficult.

4.1.5.3 Proposed Crossing Type Description

Drawings C-502 and C-503 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicularly as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.

- **Crossing Gradient** – The average existing crossing gradient at the crossing is 7 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The crossing would remain in place for the duration of the Project construction activities (e.g., 3 years). If unexpected long duration storm flows occur, site inspection of the crossing would be conducted. While the crossing site is designed to handle short duration storm-flow events throughout Project construction, unexpected long duration storm flows or use by heavy equipment may alter the temporary bridge and/or bridge approaches. If this occurs, maintenance to regrade the bridge approaches or bridge repair would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).
- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the existing ford would be used. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. The temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.6 Cavanaugh Creek, Site R-66818

4.1.6.1 Existing Conditions

The site R-66818 crossing is an existing ford (see Drawing C-601 in Appendix C). Data used in the design assumptions included field surveys conducted in June 2016, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 6 feet, and stream gradient was measured at 4 percent upstream of the crossing and 12 percent downstream. Stream bed materials consisted of gravel (30 percent), sand/silts/clay (60 percent), some boulders (5 percent), and some cobble (5 percent). The existing road is 12 feet wide and designated as public use, but was visually assessed in the field to have limited public use. Other local conditions included heavy use by cattle.

4.1.6.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – Private land; no public use is anticipated. Project use would be for the duration of Project construction activities (e.g., 3 years), with heavy machinery and four-wheel-drive vehicle use primarily between June and February. Installation of the crossing would be restricted to the in-water work window (July 1 to October 31), with no restrictions to Project use for the duration of Project construction. The crossing would be permanently removed following Project construction activities.

- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second, during periods of use.
- **Fish Presence** – Identified as fish-bearing; fish were not observed during field surveys
- **Channel Width** – 6 feet wide at the crossing
- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – 4 percent upstream of the crossing and 12 percent downstream.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge over the existing ford (Type 3A) was chosen as the proposed type based on the steep gradient in this reach. Seasonal restrictions on use would require that crossings would only be used during low-flow conditions. The temporary bridge would result in decreases in turbidity and the least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered but would be problematic due the steep channel gradient that would make leveling of the crossing for vehicle traffic difficult.

4.1.6.3 Proposed Crossing Type Description

Drawings C-602 and C-603 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (3 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** –Temporary bridge would be placed as perpendicular as possible to the channel. Abutments would be placed 5 feet minimum outside of bankfull width. Inside rise would be set at a minimum of 1.5 feet.
- **Crossing Gradient** – The average existing crossing gradient at the crossing is approximately 5 to 8 percent as the road traverses the approaches to the existing ford. The temporary bridge over the channel would be placed with as minimal slope as possible to maintain the existing stream gradient as well as the road ingress/egress.
- **Crossing Construction Period** – Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The crossing would remain in place for the duration of the Project construction activities (e.g., 3 years). If unexpected long duration storm-flows occur, site inspection of the crossing would occur. While the crossing site is designed to handle short duration storm-flow events throughout Project construction, unexpected long duration storm-flows or use by heavy equipment may alter the temporary bridge and/or bridge approaches. If this occurs, maintenance to regrade the

bridge approaches or bridge repair would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).

- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the existing ford would be used. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. The temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. . General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.1.7 Benson Creek, Site R-68790

4.1.7.1 Existing Conditions

The site R-68790 crossing is an existing ford (see Drawing C-701 in Appendix C). Data used in the design assumptions included field surveys conducted in May 2014, along with 1 arc-second resolution DEM. Existing road and stream profiles were based on those data. Channel bankfull width was measured at 18 feet, and stream gradient was measured at less than 1 percent. Stream bed materials consisted of sand/silts/clay (95 percent) and gravel (5 percent). The existing road is 12 feet wide and designated as public, but was visually assessed in the field to have limited public use. Other local conditions included heavy use by cattle.

4.1.7.2 Criteria and Conditions Used for Evaluating Crossing

- **Anticipated Use** – County road, but low public use is anticipated. Project use would be seasonally restricted to periods of low-flow (July to February) conditions. Installation of the crossing would be restricted to the in-water work window (July to October 31), with Project use of the crossing restricted to the low-flow period. The crossing structure would be removed prior to the high-flow period (February to June) and reinstalled during the in-water work window if needed for additional project construction activities. The crossing would be permanently removed following the completion of Project construction activities.
- **Stream Hydrology/Flows at Time of Use** – Expected to be very low, less than a few cubic feet per second, during periods of use.
- **Fish Presence** – Identified as fish-bearing; however, water quality was considered poor, and fish were not found during electrofishing surveys.
- **In-water Work Window** – Any construction activities planned for the proposed crossing structure within the wetted channel must occur during the ODFW designated in-water work window (July 1 to October 31).
- **Channel Width** – Bankfull width was measured at 18 outside the influence of the existing ford. At 35 feet wide at the ford, the wetted stream width was wider at the

crossing site than at typical locations upstream or downstream (17 feet wide), requiring a structure considerably longer than the typical bankfull width of 18 feet.

- **Channel Confinement** – Confined upstream and downstream, but unconfined at the crossing due to the ford crossing.
- **Stream Gradient** – One percent at the crossing and vicinity.
- **Road Ingress/Egress** – The existing road is adequate.
- **Proposed and Alternative(s) Selected** – A temporary bridge over the existing ford (Type 3A) was chosen as the proposed type over timber matting to limit disturbance in the active channel and ensure fish passage. Seasonal restrictions on use would require that this crossing only be used during low-flow conditions. The temporary bridge would result in less turbidity than timber matting and least amount of channel bed and bank disturbance over time. Timber matting (Type 4) was considered, but would be problematic because the supports would likely need to be placed in the active channel, thus disturbing the active channel and limiting fish passage.

4.1.7.3 Proposed Crossing Type Description

Drawings C-702 and C-703 in Appendix C depict the design for the site.

- **Crossing Type** – Temporary bridge over existing ford with seasonal restrictions on use (Type 3A).
- **Material Sizes/Dimensions/Quantities** – Materials for the temporary bridge would be steel support (or equivalent) with wood decking. Dimensions would be 53 feet long and 13 feet wide. Small quantities of excavation (3 cubic yards) would be needed outside the bankfull channel. Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps would also be needed at the ends of the bridge outside the bankfull channel.
- **Stability/Structural Support Needed** – Abutments under the bridge (materials and sizes dependent on local conditions). Small quantities (2 cubic yards) of angular rock, gravel, or equivalent placed as temporary ramps noted above would be needed at the ends of the bridge.
- **Arrangement** – Temporary bridge would be placed as perpendicularly as possible to the channel; however, this site crossing would follow the existing road alignment which deviates from perpendicular, creating the need for the 53-foot-long bridge. The abutments would be placed outside the wetted channel width. Inside rise would be set at a minimum of 1.5 feet. As noted above, the bridge would need to be removed for a period of long duration storm-flow events and reinstalled the following low-flow season, if need for further Project construction.
- **Crossing Gradient** – The existing ford crossing gradient is less than 1 percent. The temporary bridge over the channel would be placed with as minimal a slope as possible to maintain the road ingress/egress. Abutments would be placed to raise the bridge and provide adequate rise between the existing thalweg and the bottom of the bridge, while maintaining the minimal crossing gradient slope.
- **Crossing Construction Period** – As stated above, the use of this proposed crossing would be restricted to the period from July to February. Any construction activities for the crossing planned within the wetted channel (e.g., crossing installation) would be restricted to the in-water work window (July 1 to October 31). The proposed crossing must be removed between February and June due to higher flows in the stream. If

Project construction requires use of this site beyond one season (e.g., 3 years), the crossing structure would be reinstalled during the in-water work window (July 1 to October 31). If unexpected high flows occur between July and February, the crossing site would be inspected. While the crossing site is designed to handle typical lower seasonal flows during Project construction, unexpected high flows may alter the installed timber matting. If this occurs, maintenance to reinstall the timber matting would be needed, with all activities that are within the wetted channel restricted to the in-water work window (July 1 to October 31).

- **Post-Construction Route Inspection** – After all Project construction activities are complete, the proposed crossing would be removed. For long-term, infrequent access needs, such as route inspections of the towers and lines typically conducted by four-wheel-drive vehicles, the proposed road would be used, and the stream would be forded. The rare use would not adversely affect fish passage or stream habitat. If heavy machinery becomes needed for a repair that would require crossing the stream for access, the temporary bridge would be reinstalled, as described above, and used by the equipment to cross the stream. This temporary bridge would be removed following the repair.

The proposed type for this crossing is expected to trigger ODFW fish passage rules and regulations based on OAR 635-412-0005 (9)(a) because the temporary structure consists of original construction (see Section 2.1.2.2); however, crossing construction would occur outside of the bankfull channel. General requirements listed under OAR 635-412-0035(1) Fish Passage Criteria would be applicable to this road-stream crossing site. Although specific requirements under OAR 635-412-0035 for temporary bridges are not listed, some of the requirements under OAR 635-412-0035(3)(a) for fish passage at road-stream crossing structures such as bridges and culverts may apply.

4.2 Summary

Designs for each of the road-stream crossing sites described in Section 4.1 were developed based on the information in Sections 2 and 3 above. Potential impacts to stream habitat during construction and for post-construction purposes will be minimized by designing and constructing effective erosion control measures and sediment barriers at the various road approaches to the channel crossing. For example, the temporary ramps at either end of the temporary bridge crossings can be expanded further, both to increase overall erosion control benefits outside of the bankfull channel and to minimize the amount of sediment contributed to the stream by vehicles. The road-stream crossings expected to trigger OAR 635-412-0020 are summarized in Table 2. Because all of these temporary structures consist of original construction over fish-bearing streams in Oregon, based on fish passage rules and regulations they will require review by the ODFW. The Fish Passage Plans prepared according to ODFW guidelines are provided in Appendix B, and design drawings for the seven road-stream crossing sites with general design and erosion control information are included in Appendix C.

Table 2. Fish-Bearing Road-Stream Crossings Requiring ODFW-Approved Fish Passage Plans and Designs

Stream Name	Crossing ID	Existing Crossing	Proposed Crossing[1]	Erosion and Sediment Control Needed?	Design Type Requires Seasonal Restrictions?[2]	Disturbance within Bankfull Width?
Little Rock Creek	R-33010	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33011	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33033	NA – Primitive Ford[3]	3A	Yes	Yes	No
Rock Creek	R-33147	Primitive Ford	3A	Yes	Yes	No
Goodman Creek	R-65725	Ford	3B	Yes	Yes	No
Cavanaugh Creek	R-66818	Ford	3A	Yes	Yes	No
Benson Creek	R-68790	Ford	3A	Yes	Yes	No

[1] Crossing Type (No.)/Description: 3A. Install temporary bridge over existing structure, 3B. Install temporary bridge adjacent to existing structure
[2] Seasonal restrictions on use will require that crossings will only be used during low-flow conditions to limit impacts to water quality and avoid periods of fish utilization. Conditions on use may require removal of the structure(s) in cases of extreme flow events.
[3] NA = No access; crossing type assumed or assessed from aerial photos.

5.0 REFERENCES

AASHTO (American Association of State Highway and Transportation Officials). 2003. Standard Specifications for Highway Bridges.

NOAA Fisheries (National Ocean and Atmospheric Administration, National Marine Fisheries Service). 2008. Anadromous Salmonid Passage Facility Design. Northwest Region. Portland, OR. 2008

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ODF. 2014. Forest Practice Administrative Rules and Forest Practices Act. Chapter 629, Division 625: Forest Practices Administration. Available online at: http://www.oregon.gov/odf/privateforests/docs/FPArulebk.pdf

ODFW (Oregon Department of Fish and Wildlife). 2008a. Clarification of Fish Passage Triggers and Guidelines for Bridges. Available online at: http://www.dfw.state.or.us/fish/CRP/docs/coastal_coho/permit_streamlining/Newport/ODFW/ODFW%20Fish%20Passage/Passage%20and%20Bridges%20FINAL%20-%20Mar%202008.pdf

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ODOT (Oregon Department of Transportation). 2008. Oregon Standard Specifications for Construction. Available online at: http://www.oregon.gov/ODOT/hwy/specs/docs/08book/08_00200.pdf

Seidel, Nigel. 2015a. Email from Nigel Seidel, East Region Energy Coordinator, ODFW, to IPC and Tetra Tech. January 28.

Seidel, Nigel. 2015b. Email from Nigel Seidel, East Region Energy Coordinator, ODFW, to IPC. June 26.

Tetra Tech. 2014. Fish Habitat and Stream Crossing Assessment Summary Report. Prepared for Idaho Power Company. October.

Tetra Tech. 2015. Fish Passage Plans and Designs. Prepared for Idaho Power Company. September.

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USDC (U.S. Department of Commerce). 2013. Reinitiation of the Endangered Species Act Section 7 Formal Programmatic Conference and Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Aquatic Restoration Activities in the States of Oregon and Washington (ARBO II). United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service.

USDOT (U.S. Department of Transportation). 2003. Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects. FP-03 US Customary Units. Federal Highway Administration, Federal Lands Highway.

APPENDIX A
2015 ODFW FISH PASSAGE PLAN APPROVALS

Note

On December 30, 2015, the Oregon Department of Fish and Wildlife (ODFW) issued the following approvals to Idaho Power Company for the six fish passage plans contained in the 2015 Fish Passage Plans and Designs report, concerning stream crossings where ODFW's fish passage authority had been invoked. Two of these crossing sites with approved fish passage plans are included in the current 2016 report—R-65725 (formerly 0-325) and R-68790 (formerly 0-337).

Funkhouser, Zach

From: Greg D Apke [greg.d.apke@state.or.us]
Sent: Wednesday, December 30, 2015 3:37 PM
To: Funkhouser, Zach; Adams, Todd
Cc: Alan Ritchey; Art Martin (art.c.martin@state.or.us); David T Banks; greg.d.apke@state.or.us; Jon Germond; Ken Loffink; WOODS Maxwell; Nick Myatt (nick.a.myatt@state.or.us); Nigel E Seidel; BAILEY Timothy D (Timothy.D.Bailey@state.or.us)
Subject: ODFW Fish Passage Approvals for the Boardman to Hemingway Transmission Line (B2H) Project PA-09-0016 through PA-09-0021
Attachments: ODFW Fish Passage Approval - B2H Transmission Line Project 12-30-2015.pdf

Importance: High

Mr. Funkhouser and Mr. Adams,

Attached is the Oregon Department of Fish and Wildlife's (ODFW) fish passage approval for the six (6) projects associated with the Boardman to Hemingway Transmission Line (B2H) Project. The attached correspondence serves to approval all six of the stream crossings where ODFW's fish passage authority has been invoked. This "batched" approval fulfils ODFW's commitment to streamline the fish passage approvals associated with the project into one efficient fish passage approval for the project. While there are six unique approvals (**PA-09-0016 – 0021**), one for each trigger event, this correspondence serves to comprehensively provide the appropriate fish passage authorization for the project. Please note the specific operational items and provisions of this fish passage approval. These provisions apply to each of the six projects covered by this authorization.

The six projects approved for fish passage include:

IP's Crossing ID and Milepost (from Table 1 in the Fish Passage Application)	ODFW Fish Passage Approval Number	ODFW In-Water Work Window
Clover Creek 0-192, MP 116.4	PA-09-0016 - New Channel Spanning Temporary Timber Matt Crossing, Jimmy Creek Tributary, Union Cty.	July 1 – October 31
Jordan Creek 0-394, MP 2.2	PA-09-0017 – Ford Stream Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Goodman Creek 0-325, MP 183.5	PA-09-0018 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Cavanaugh Creek 1-025, MP 185.8	PA-09-0019 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Benson Creek 0-337, MP 190.5	PA-09-0020 – New Temporary Bridge Crossing, Snake River Tributary, Baker Cty.	July 1 – October 31
Cottonwood Creek 0-401, MP 221.9	PA-09-0021 - New Channel Spanning Temporary Timber Matt Crossing, Malheur Cty.	November 1 - March 31

Please retain and distribute this correspondence for B2H Project. These fish passage approvals are solely for the purpose of fulfilling Oregon fish passage statutory requirements and responsibilities administered by the Commission or the Department and do not satisfy any other Department, federal, state, or local laws, rules, or regulations, including but not limited to State or Federal Endangered Species Acts, any applicable water rights, approvals or other certificates administered by regulatory authorities.

As the B2H Project approaches the implementation phase(s) please continue to work with Nigel Seidel, ODFW's East Region Energy Coordinator and the two ODFW District Fisheries Biologists (Tim Bailey and David Banks) if issues develop and prior to construction.

Please contact me at 503-947-6228 or by email at greg.d.apke@state.or.us if you have any questions regarding the content of these fish passage approvals.

Thanks, Greg

****

Greg Apke
Oregon Department of Fish and Wildlife - Fish Division
Statewide Fish Passage Program Leader
4034 Fairview Industrial Drive SE
Salem, Oregon 97302
503-947-6228 (office)
503-931-4361 (cell)
greg.d.apke@state.or.us
ODFW Fish Passage Internet Access

****

Oregon
Kate Brown, Governor

Department of Fish and Wildlife
Fish Division
4034 Fairview Industrial Drive SE
Salem, OR 97302
(503) 947-6201
FAX (503) 947-6202
www.dfw.state.or.us/

December 30, 2015

Zak Funkhouser
Permitting Manager
Idaho Power Company
1221 W Idaho Street
Boise ID 83702

and

Todd Adams
B2H Project Manager
Idaho Power Company
1221 W Idaho Street
Boise ID 83702

Re: Boardman to Hemingway Transmission Line Project – ODFW Fish Passage Approvals (PA-09-0016, PA-09-0017, PA-09-0018, PA-09-0019, PA-09-0020, PA-09-0021)

Mr. Funkhouser and Mr. Adams,

Attached are the Oregon Department of Fish and Wildlife (ODFW) Fish Passage Approvals, as required by ORS 509.585, for the six projects within the Idaho Power Company's (IP)/(Applicant) Boardman to Hemingway (B2H) new Transmission Line Project (Project). Associated with this project are infrastructure improvements and upgrades (road-stream crossings) to allow access to IP's new transmission line facility. Of the multiple stream crossings associated with the project, we have identified six (6) stream crossings identified below that have triggered the State of Oregon's fish passage authority.

This correspondence serves to approval all six of the stream crossings where ODFW's fish passage authority has been invoked. This "batched" approval fulfils ODFW's commitment to streamline the fish passage approvals associated with the project into one efficient fish passage approval for the project. While there are six unique approvals (**PA-09-0016 – 0021**), one for each trigger event, this correspondence serves to comprehensively provide the appropriate fish passage authorization for the project.

The six projects approved for fish passage include:

IP's Crossing ID and Milepost (from Table 1 in the Fish Passage Application)	ODFW Fish Passage Approval Number	ODFW In-Water Work Window
Clover Creek 0-192, MP 116.4	PA-09-0016 - New Channel Spanning Temporary Timber Matt Crossing, Jimmy Creek Tributary, Union Cty.	July 1 – October 31
Jordan Creek 0-394, MP 2.2	PA-09-0017 – Ford Stream Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Goodman Creek 0-325, MP 183.5	PA-09-0018 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Cavanaugh Creek 1-025, MP 185.8	PA-09-0019 - New Temporary Bridge Crossing, Burnt River Tributary, Baker Cty.	July 1 – October 31
Benson Creek 0-337, MP 190.5	PA-09-0020 – New Temporary Bridge Crossing, Snake River Tributary, Baker Cty.	July 1 – October 31
Cottonwood Creek 0-401, MP 221.9	PA-09-0021 - New Channel Spanning Temporary Timber Matt Crossing, Malheur Cty.	November 1 - March 31

ODFW has reviewed, as required by ORS 509.585 and approves these six fish passage design structures which IP plans to install along the B2H Transmission Line project, located on various tributaries of the Powder and Snake River Basin in Baker, Union, and Malheur Counties. These road-stream crossings have been engineered to either span the corresponding stream's active channel widths or will simulate the natural streambed conditions. ODFW's Fish Passage Program staff reviewed the designs for these six projects and we conclude they are are consistent with and meet Oregon Fish Passage Design Criteria (OAR 635-412-0035(1) and (3)).

These six projects approved by this approval are contingent on specific operational items and provisions which include:

1. All in water work for these six projects shall occur during the ODFW in-water work windows for each waterbody (see above table for specific dates).
2. Temporary water management and fish rescue, salvage, and recovery, is required (as prescribed in OAR 635-412-0035 (10)) prior to all in-water work activities (defined as all work at or below the ordinary high water elevation) associated with the project. Fish salvage activities requires the applicant to obtain State of Oregon Scientific Take Permits from ODFW.
3. Wildlife rescue, salvage, and recovery activities associated with the project requires the applicant to obtain State of Oregon Wildlife Rescue Salvage Permits from ODFW.

4. Fish passage design standards, as defined in OAR 635-412-0035(1) and (3) shall be implemented for all fish passage components of these projects.
5. Idaho Power Company (Applicant) shall be responsible for all maintenance required such that the projects provide adequate passage for native migratory fish. If monitoring by the Applicant or Department indicates that fish passage is not being provided, the Applicant in consultation with the Department shall determine the cause and, during a work period approved by the Department, shall modify the structure as appropriate to rectify problems as necessary. Failure to maintain fish passage for the duration of these approvals shall constitute a violation of these approvals and applicable fish passage laws (ORS 509.610).
6. After project completion, the applicant or your designee, shall maintain, monitor, evaluate, and report on the effectiveness of fish passage as required under OAR 509.610, and shall provide written status reports to the Department's Fish Passage Program annually for the first three (3) years and then a final report at year-5, or as determined by the Department. Reports shall include photographs from established photo-points as part of the fish passage evaluation and monitoring. Monitoring, evaluation, and reporting shall be conducted annually unless problems are observed that may require additional analyses. Fish passage reports shall consist of visual observations, photographs, as-built plan reviews, and future site visits with regards to fish passage at and through the project sites. Reports shall be submitted to the State Fish Passage Coordinator and the La Grande and Malheur Watershed District Fish Biologists. Electronic or hard copy submissions are acceptable.
7. Failure to maintain fish passage at these locations shall constitute a violation of these approvals and applicable fish passage laws (ORS 509.585 and 509.610).
8. The Department shall be allowed to inspect the six projects at reasonable times for the duration of these approvals. Unless prompted by emergency or other exigent circumstances, inspection shall be limited to regular and usual business hours, including weekends.
9. The appropriate ODFW District Fish Biologist shall be contacted 2-weeks in advance and prior to the implementation of these projects.
10. These fish passage approvals in no way purport or authorize take of a federally listed species.

Please retain and distribute this correspondence for your records, as this documents ODFW's six fish passage approvals for the Boardman to Hemingway Project (PA-09-0016 through PA-09-0021). These fish passage approvals are solely for the purpose of fulfilling Oregon fish passage statutory requirements and responsibilities administered by the Commission or the Department and do not satisfy any other Department, federal, state, or local laws, rules, or regulations, including but not limited to State or Federal Endangered Species Acts, any applicable water rights, approvals or other certificates administered by regulatory authorities.

Please contact me at 503-947-6228 or by email at greg.d.apke@state.or.us if you have any questions regarding the content of these fish passage approvals.

Sincerely,

Greg Apke
ODFW Statewide Fish Passage Program Coordinator

Cc:
Nigel Sidel, ODFW East Region Energy Coordinator
Nick Myatt, ODFW La Grande Watershed Manager
Tim Bailey, ODFW La Grande Watershed District Biologist
David Banks, ODFW Malheur Watershed District Biologist
Alan Ritchey, ODFW Screens and Passage Program Manager
Ken Loffink, ODFW Assistant Fish Passage Program Coordinator
Maxwell Woods, Oregon Department of Energy Siting Analyst
Jon Germond, ODFW Land Resources Program Manager
Project Files (PA-09-0016 through PA-09-0021)

APPENDIX B
ODFW FISH PASSAGE PLANS

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Little Rock Creek, B2H SITE R-33010
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 179387°W Latitude: 45.293739°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 03S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	Ford span = 19 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	19 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	19 feet
	• **UPSTREAM SLOPE** [g]	3%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2.5% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*¼-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33011
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 178634°W Latitude: 45.294196°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	Ford span = 19 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

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[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

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[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

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• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33033
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 176842°W Latitude: 45.294338°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	crossing span = 20 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 25%, Cobble = 40%, Gravel = 25%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

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[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Rock Creek, B2H SITE R-33147
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Rock Creek (HUC 170601040306)
- **COORDINATES** [a] ..... Longitude: -118. 172486°W Latitude: 45.2920548°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 22 Tax Map #: 03S37E
  Township: 3S Tax Lot #: ROADS
  Range: 37E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Washed-out bridge crossing along private road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay, sand, cobble, boulder).
	• **LENGTH**	crossing span = 20 feet (washed-out bridge, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	20 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	20 feet
	• **UPSTREAM SLOPE** [g]	2%
	• **DOWNSTREAM SLOPE** [g]	2%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 30%, Cobble = 40%, Gravel = 20%, Sand/Silt/Clay = 10%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 38 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	38 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	34 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Union
- **ROAD** ..... Private (Morgan Lake Road)
- **RIVER/STREAM** ..... Goodman, B2H SITE R-65725
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Burnt River (HUC 170502020808)
- **COORDINATES** [a] ..... Longitude: -118. 172486°W Latitude: 45.2920548°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 33 Tax Map #: 13S44E
  Township: 13S Tax Lot #: ROADS
  Range: 44E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Unimproved existing ford.
	• **MATERIAL** [c]	Native bed material (sand, gravel).
	• **LENGTH**	Crossing span = 12 feet (existing ford)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	8 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	8 feet
	• **UPSTREAM SLOPE** [g]	5%
	• **DOWNSTREAM SLOPE** [g]	9%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 0%, Cobble = 0%, Gravel = 20%, Sand/Silt/Clay = 80%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 53 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	53 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	1.5 feet above the 2-year storm event.
	INSIDE SPAN (Width)	30 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*¼-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED**..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as Silt Fence, Fiber Rolls, or Equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Baker
- **ROAD** ..... Cavanaugh Creek Road
- **RIVER/STREAM** ..... Cavanaugh Creek, B2H SITE R-66818
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Burnt River (HUC 170502020809)
- **COORDINATES** [a] ..... Longitude: -117. 304958°W Latitude: 44.3734541°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 33 Tax Map #: 13S44E
  Township: 13S Tax Lot #: ROADS
  Range: 44E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Unimproved existing ford.
	• **MATERIAL** [c]	Native bed material (sand, gravel).
	• **LENGTH**	Crossing span = 12 feet (existing ford)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	8 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	8 feet
	• **UPSTREAM SLOPE** [g]	4%
	• **DOWNSTREAM SLOPE** [g]	12%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 5%, Cobble = 5%, Gravel = 30%, Sand/Silt/Clay = 60%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 53 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	53 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	49 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	2% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*½-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

OREGON DEPARTMENT OF FISH AND WILDLIFE

Fish Passage Plan for a Road-Stream Crossing

- *If you unlock and re-lock this Form, information already entered may be lost in certain versions of MS Word.*
- *If your project includes multiple crossings, please complete this form for each crossing.*

APPLICANT INFORMATION

APPLICANT: Zach Funkhouser **TITLE:**
ORGANIZATION: IDAHO POWER COMPANY
ADDRESS: 1221 W Idaho Street
CITY: Boise **STATE:** ID **ZIP:** 83702
PHONE: (877) 339-0209
FAX:
E-MAIL ADDRESS: ZFunkhouser@idahopower.com

SIGNATURE: _____ **DATE:** _____

AUTHORIZED AGENT (*if any*)**:** Chris James **TITLE:** Hydrologist
ORGANIZATION: Tetra Tech, Inc.
ADDRESS: 3380 Americana Terrace, Suite 201
CITY: Boise **STATE:** ID **ZIP:** 83706
PHONE: (503) 358-7079
FAX:
E-MAIL ADDRESS: Chris.James@tetratech.com

SIGNATURE: _____ **DATE:** _____

OWNER (*if different than Applicant*)**:** **TITLE:**
ORGANIZATION:
ADDRESS:
CITY: **STATE:** **ZIP:**
PHONE:
FAX:
E-MAIL ADDRESS:

SIGNATURE: _____ **DATE:** _____

LOCATION

- **COUNTY** ..... Baker
- **ROAD** ..... Benson Creek Road
- **RIVER/STREAM** ..... Benson Creek, B2H SITE R-68790
- **TRIBUTARY OF** ..... Snake River
- **BASIN** ..... Benson Creek (HUC 170502010205)
- **COORDINATES** [a] ..... Longitude: -117.265213°W Latitude: 44.313367°N
- **LEGAL DESCRIPTION** ..... ¼ / ¼: NW/NW
  Section: 31 Tax Map #: 14S45E
  Township: 14S Tax Lot #: ROADS
  Range: 45E

[a] *geographic projection using NAD_83 and formatted as decimal degrees to at least 4 places*

STREAM CROSSING INFORMATION

Please indicate measurement units where applicable and see footnotes for supporting descriptions of the information requested.

NEW CROSSING ☐
REPLACEMENT OF EXISTING CROSSING ☐
MODIFICATION OF EXISTING CROSSING ☒

EXISTING CROSSING	• **TYPE/SHAPE** [b]	Existing ford along county road.
	• **MATERIAL** [c]	Native bed material (sand/silt/clay).
	• **LENGTH**	Ford span = 35 feet (shallow ford, wetted stream width)
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	N/A
	INSIDE SPAN (Width)	N/A
	• **CULVERT SLOPE**	N/A
	• **DOES IT CONTROL AN UPSTREAM POND, WETLAND, BACKWATER AREA, OR WATER RIGHT?** [d]	Yes ☐ No ☒
STREAM	• **AVERAGE UPSTREAM ACW** [e,f]	18 feet
	• **AVERAGE DOWNSTREAM ACW** [e,f]	18 feet
	• **UPSTREAM SLOPE** [g]	1%
	• **DOWNSTREAM SLOPE** [g]	1%
	• **DESCRIBE STREAMBED MATERIAL**	Bedrock = 0%, Boulder = 0%, Cobble = 0%, Gravel = 5%, Sand/Silt/Clay = 95%
	• **SIZE OF D_{100} ROCK** [h]	3 inches, estimated from photographs and field surveys.
PROPOSED CROSSING	• **TYPE/SHAPE** [b]	Temporary bridge, 53 feet long x 13 feet wide.
	• **MATERIAL** [c]	Steel, wood decking.
	• **LENGTH**	53 feet (see drawings for details).
	• **INSIDE DIAMETER** (*if round*)	N/A
	OR	
	INSIDE RISE (Height) **AND**	0.5 foot above the 2-year storm event.
	INSIDE SPAN (Width)	49 feet
	• **CULVERT SLOPE**	N/A
	• **BED HEIGHT – INLET** [i,j]	N/A
	• **BED HEIGHT – OUTLET** [i,k]	N/A
	• **BED SLOPE** [i]	1% at crossing. No change over existing bed slope.
	• **BED MATERIAL** [i] (*describe and/or fill in %s*)	No change in bed material (see streambed materials description above).
	% FINES (*dirt, silt, sand*)	
	% SMALL ROCK (*¼-6" diameter*)	
	% LARGE ROCK (*6"-D_{100}*) [h]	
	% OVER-SIZED ROCK (*D_{150}-D_{200}*) [h]	
	• **BED PLACEMENT METHOD** [i]	Streambed to be left intact.
	• **BED RETENTION MEASURES** [i]	None proposed.
	• **GRADE CONTROL MEASURES** [l]	None proposed.
	• **ADDITIONAL STRUCTURES** [m]	None proposed.
CONSTRUCTION	• **DATE WORK WILL BEGIN**	

	• **DATE WORK WILL BE COMPLETED** ..	
	• **DETAILS** [n]	All work is expected to be outside of the bankfull width. Isolation and fish salvage are not anticipated. Any work within the wetted area will occur within the ODFW designated in-water work window. Bridge may be removed during high-flow periods. No seasonal restrictions on use would occur if the bridge is in place. Effective erosion control measures and sediment barriers for the road approaches such as silt fence, fiber rolls, or equivalent will be placed downgradient of construction area to capture dislodged sediment.
MAINTENANCE	• **WILL THE CROSSING BE INSPECTED FOR DEBRIS AND BED RETENTION (WITHIN, BELOW, AND ABOVE THE CROSSING) AT LEAST ANNUALLY AND AFTER STORM EVENTS?**	Yes ☒ No ☐
	• **IF NEEDED, WILL REMEDIAL MEASURES BE TAKEN AS SOON AS POSSIBLE?**	Yes ☒ No ☐

[b] *e.g., bridge, open-bottomed arch, pipe arch/squashed, round, rectangular*

[c] *e.g., reinforced concrete, concrete, wood, plastic, corrugated metal, metal*

[d] *if "Yes", explain how these will be addressed in a separate attachment*

[e] *"ACW" is the active channel width, which is the stream width between the ordinary high water lines, or at the channel bankfull elevation if the ordinary high water lines are indeterminate; ordinary high water lines are not the same as the wetted width and are typically determined by changes on the bank in vegetation, changes in sediment size and/or color, water lines on the bank, trees, or leaves, or the point where debris (e.g., needles, leaves, twigs, cones) accumulation begins*

[f] *3 measurements 20 feet apart should be averaged; begin measurements approximately 10 ACWs from the inlet (upstream) or outlet (downstream) of the crossing if this distance is outside of the influence of existing artificial obstructions and prior to adjoining tributaries as you move away from the crossing (if not, take measures at locations which fulfill these requirements); indicate measurement locations on the* **Profile Design Drawing**

[g] *take measurements away from the crossing and at the point where ACW measurement begins*

[h] *D_{100} is the average diameter of the 10 largest, naturally-occurring rocks in the stream reach; $D_{150} = D_{100} \times 1.5$; $D_{200} = D_{100} \times 2$*

[i] *"bed" refers to the stream bed within or under the crossing structure*

[j] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's inlet*

[k] *depth of fill material or countersinking/embedding (excluding protruding over-sized rock) at the crossing's outlet*

[l] *these are measures outside of the crossing structure intended to prevent up- or downstream channel degradation, especially important to consider in locations where an existing smaller culvert is being replaced and there is the potential for upstream channel degradation (i.e., a "headcut") and associated off-site property or passage problems*

[m] *e.g., bed retention measures, weirs, baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures*

[n] *unless already described in an accompanying Department of State Lands Removal-Fill Application, include a description of a) temporary downstream passage, upstream passage, screening, and bypass measures, b) worksite isolation measures, c) fish salvage (note: an ODFW Fish Take Permit may be necessary), d) sediment and erosion control measures, and e) site restoration measures. For more details on Oregon Fill Removal Law see the Oregon Division of State Lands Removal-Fill Guide at* http://oregonstatelands.us/DSL/PERMITS/rfg.shtml .

ADDITIONAL INFORMATION

*Provide this information **only if** the bed within the proposed crossing is not as wide as the active channel width or will not be embedded.*

	High Design Flow [o]	Low Design Flow [p]
Flow [q] (cfs)		
Water Depth in Crossing (in.)		
Water Velocity in Crossing (fps)		
Water Drop [r] at Inlet (in.)		
Water Drop [r] at Outlet (in.)		
Pool Depth Below Outlet (in.)		
Water Drop [r] at Weirs/Baffles (in.)		
Pool Depth Below Weirs/Baffles (in.)		
Depth of Nappe [s] at Weirs/Baffles (in.)		

[o] *High Design Flow is the mean daily average stream discharge that is exceeded 5 percent of the time during the period when ODFW determines that native migratory fish require fish passage*
[p] *Low Design Flow is the mean daily average stream discharge that is exceeded 95 percent of the time, excluding days with no flow, during the period when ODFW determines that native migratory fish require fish passage*
[q] *attach a description of the methodology, calculations, and assumptions used to determine the high and low design flows*
[r] *drop should be measured from the upstream water surface elevation to the downstream water surface elevation*
[s] *the nappe is the water flowing over weirs/baffles*

DESIGN DRAWINGS

Please attach the following design drawings with the specified information on them.

☒ -- **PLAN**, including:
- active channel (i.e., ordinary high water or bankfull lines)
- existing crossing and additional structures
- proposed crossing and additional structures
- dimensions

☒ -- **PROFILE**, including:
- existing grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet [i.e., downstream end of crossing] to 10 ACWs upstream of the inlet [i.e., upstream end of crossing], at 5-foot intervals), including road
- existing crossing and additional structures
- proposed grade (measured at the deepest part of the stream channel from 10 ACWs downstream of the outlet to 10 ACWs upstream of the inlet, at 5-foot intervals), including road
- proposed crossing, bed, and additional structures
- dimensions
- location of **STREAM CHANNEL CROSS-SECTIONS** (see below), *ACW* measurements, and *Slope* measurements
- water surface elevations at high and low design flows for the proposed crossing, **if** the proposed crossing will not be as wide as the active channel width or will not be embedded

☒ -- **CROSS-SECTION OF PROPOSED CROSSING**, including bed details

☐ -- **STREAM CHANNEL CROSS-SECTIONS** *(2 cross-sections total, with one located downstream where the ACW measurements begin and one located upstream where the ACW measurements begin; measurements should be taken at 1-foot intervals perpendicular to the flow of the stream and should encompass the entire active channel plus 0.5 ACW on each side of the stream [for a total cross-section measurement of 2 x ACW]; measurements may be taken with survey equipment or by measuring the distance from a level line to the bottom of the streambed or ground)*

☐ -- **DETAILS OF ADDITIONAL STRUCTURES** *(e.g., grade control measures, bed retention measures, weirs/baffles, trash racks, aprons, retaining walls, overflow pipes, channel restoration/scour remediation measures)*

Please submit this application along with project design plans to the appropriate ODFW District Fish Biologist for the crossing's location. The Complete application can also be sent electronically to the ODFW Fish Passage Coordinator at greg.d.apke@state.or.us and send one signed original paper copy of the application to the ODFW Fish Passage Coordinator at 3406 Cherry Avenue NE, Salem, OR 97303.

• *ODFW will use the following criteria to determine the level of review required.*

For ODFW Use Only

	YES	NO	N/A
1. Is the bed within the crossing as wide as the active channel:	☐	☐	
2. Is the bed within the culvert at the same slope, and at grades continuous with, the surrounding stream:	☐	☐	
3a. If the crossing is open-bottomed, is there 3 feet of vertical clearance between the active channel width elevation and the inside top of the crossing:	☐	☐	☐
OR			
3b. If the crossing is closed-bottomed, will bed depth within the culvert be 20-50% of the crossing height:	☐	☐	☐
4. Is the bed material that will be used sufficient to assure water depth will be similar to that in the surrounding stream (i.e., will not go sub-surface prematurely):	☐	☐	
5. Are the bed material or retention measures that will be used sufficient to assure that the bed will be maintained through time:	☐	☐	
6. If the crossing is longer than 40 feet, will partially-buried, over-sized rock be placed within the crossing's bed:	☐	☐	☐
7. Will the bed within the crossing be placed during construction:	☐	☐	
8. If trash racks are present, are they above the active channel width elevation and do vertical bars have at least 9 inches of clear space between them:	☐	☐	☐
9. If there is an upstream pond, wetland, or backwater area, has its desired state after construction been determined, and have these considerations been addressed in the design:	☐	☐	☐
10. Are upstream grade control measures satisfactory:	☐	☐	
11. Are the construction timing and measures adequate based on the location:	☐	☐	
12. Are there plans to maintain the crossing:	☐	☐	

- If all answers are "Yes" or "Not Applicable", this plan is eligible for approval by an ODFW biologist.
- If any answer is "No" or there are other concerns, consult with the Fish Passage Coordinator.

APPLICATION IDENTIFIER:
DATE RECEIVED:

APPROVED ☐ **SIGNATURE:** _____ **DATE:** _____
DENIED ☐ **TITLE:**

CONDITIONS:

APPENDIX C
DESIGN DRAWINGS

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY
TRANSMISSION LINE PROJECT
FISH-BEARING ROAD-STREAM CROSSING DESIGNS

LOCATION MAP
SCALE: 1 INCH = 40 MILES

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DRAWING INDEX	
DWG NO.	TITLE
GENERAL	
G-001	COVER SHEET
G-002	GENERAL NOTES & EROSION CONTROL DETAILS
CIVIL	
C-101	CROSSING R-33010 - EXISTING CONDITIONS AND SITE PHOTOS
C-102	CROSSING R-33010 - PROPOSED PLAN VIEW
C-103	CROSSING R-33010 - PROFILE VIEWS AND DETAILS
C-201	CROSSING R-33011 - EXISTING CONDITIONS AND SITE PHOTOS
C-202	CROSSING R-33011 - PROPOSED PLAN VIEW
C-203	CROSSING R-33011 - PROFILE VIEWS AND DETAILS
C-301	CROSSING R-33033 - EXISTING CONDITIONS AND SITE PHOTOS
C-302	CROSSING R-33033 - PROPOSED PLAN VIEW
C-303	CROSSING R-33033 - PROFILE VIEWS AND DETAILS
C-401	CROSSING R-33147 - EXISTING CONDITIONS AND SITE PHOTOS
C-402	CROSSING R-33147 - PROPOSED PLAN VIEW
C-403	CROSSING R-33147 - PROFILE VIEWS AND DETAILS
C-501	CROSSING R-65725 - EXISTING CONDITIONS AND SITE PHOTOS
C-502	CROSSING R-65725 - PROPOSED PLAN VIEW
C-503	CROSSING R-65725 - PROFILE VIEWS AND DETAILS
C-601	CROSSING R-66818 - EXISTING CONDITIONS AND SITE PHOTOS
C-602	CROSSING R-66818 - PROPOSED PLAN VIEW
C-603	CROSSING R-66818 - PROFILE VIEWS AND DETAILS
C-701	CROSSING R-68790 - EXISTING CONDITIONS AND SITE PHOTOS
C-702	CROSSING R-68790 - PROPOSED PLAN VIEW
C-703	CROSSING R-68790 - EXISTING CONDITIONS AND SITE PHOTOS

PROJECT DATUM:
HORIZONTAL: HARN/WO OREGON STATE PLANES, NORTH ZONE, INTERNATIONAL FOOT
VERTICAL: NAVD88

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Bothell, Washington 98011
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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

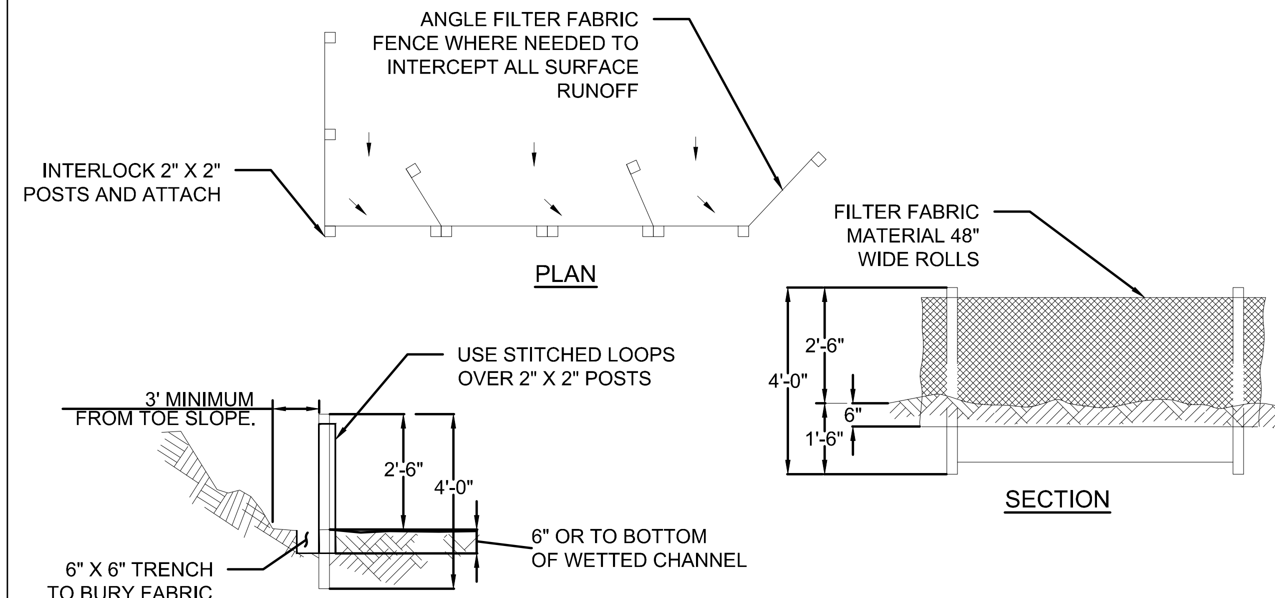
COVERSHEET

DWG. NO.: G - 001
CREATED: 10/28/2016
SHEET: 01 OF 23
SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C SHEET FILES COVER SHEET AND NOTES.DWG
PLOT DETAILS: ANDREWS, JEREMY N on 10/28/2016 1:24 PM

GENERAL NOTES:

1. SITE TOPOGRAPHY FOR ALL SITES IS BASED ON EXISTING USGS DEM OR LIDAR AS INDICATED ON SITE SPECIFIC DRAWINGS. ONSITE TOPOGRAPHIC SURVEYS HAVE NOT BEEN COMPLETED. DETERMINATION OF CHANNEL GEOMETRY BASED ON FIELD SURVEYS OF ROAD CROSSINGS AND STREAM HABITAT. CROSSING AND ROAD TOPOGRAPHY SHALL BE FIELD VERIFIED.
2. FOR DESIGN PURPOSES, ORDINARY HIGH WATER AND ACTIVE CHANNEL IS ASSUMED TO BE EQUIVALENT TO BANKFULL WIDTH.
3. ALL CROSSING STRUCTURES ASSUMED TO WITHSTAND HL-93 LOADING. STRUCTURAL DETAILS AND STRENGTH REQUIREMENTS OF TEMPORARY STRUCTURES TO BE VERIFIED BY THE CONTRACTOR PER THE LOADING OF SELECTED CONSTRUCTION EQUIPMENT. CONTRACTOR SHALL SUBMIT FINAL STRUCTURAL PLANS FOR TEMPORARY STRUCTURES SUBJECT TO ENGINEERS APPROVAL.
4. ALL ROADS AT CROSSINGS ASSUMED TO REQUIRE MINIMUM 10 FOOT WIDTH AND SPANNING MINIMUM 1.5 TIMES THE ACTIVE CHANNEL WIDTH, WHENEVER POSSIBLE.
5. ALTERNATIVES CALLING FOR TIMBER MATTING WILL REQUIRE SEASONAL RESTRICTIONS OR LIMITATIONS ON USE; SPECIFIC REQUIREMENTS TO BE DETERMINED PRIOR TO FINAL DESIGNS.
6. ROAD CROSSING SITES R-33010, R-33011, AND R-33033 WERE NOT VISITED AT THE CROSSING LOCATION DUE TO LACK OF ACCESS. ANALYSIS OF EXISTING STRUCTURES AND PROPOSED ALTERNATIVE(S) SELECTED BASED ON AERIAL IMAGERY, USGS DEM, AND OTHER LOCAL DATA.
7. STREAM CROSSING CONSTRUCTION ASSUMED TO OCCUR AT DIFFERENT SITES AT THE SAME TIME. THIS REQUIRES SEVERAL SITES TO HAVE INDIVIDUAL CROSSING MATERIALS, RATHER THAN THE SAME MATERIALS BEING USED AND TRANSPORTED TO ALL CROSSINGS.



SILT FENCE DETAIL (TYP.)

(SCALE NTS)

SILT FENCE NOTES:

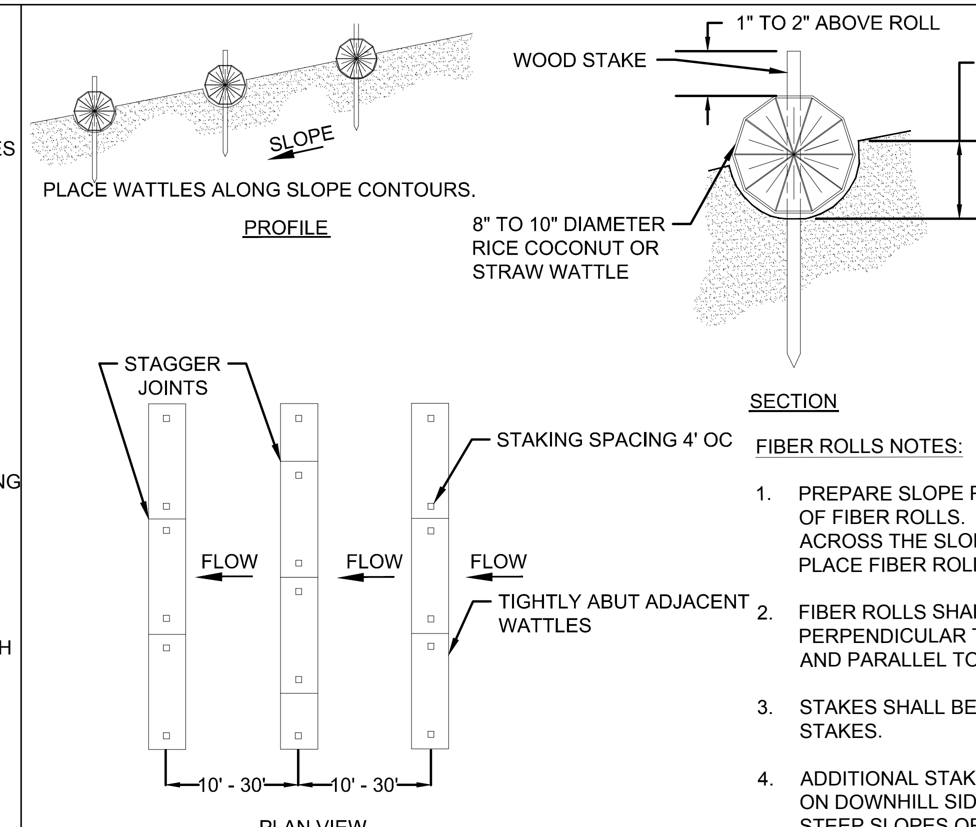
1. SILT FENCE SHALL BE INSTALLED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. SILT FENCE DRAINAGE AREA OF $\frac{1}{4}$ ACRE PER 100 LINEAR FT.
3. BOTTOM EDGE OF SILT FENCE SHALL BE BURIED MIN. 6" OR TO BOTTOM OF WETTED CHANNEL.
4. POSTS MAY BE 2" X 2" WOOD OR STEEL.
5. POSTS TO BE INSTALLED ON DOWNHILL SIDE OF FABRIC.
6. COMPACT BACKFILLED TRENCH SOIL.
7. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES 1/3 OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF TO AN AREA THAT CAN BE PERMANENTLY STABILIZED.

TEMPORARY EROSION CONTROL NOTES:

1. BEST MANAGEMENT PRACTICES (BMPS) AS REQUIRED BY PERMITTING.
2. INSTREAM WORK WINDOWS FOR WORK REQUIRED WITHIN THE BANKFULL LINE SHALL BE IN ACCORDANCE WITH OREGON DEPARTMENT OF FISH AND WILDLIFE (ODFW) GUIDELINES.
3. WHERE REQUIRED, FISH ISOLATION AND SALVAGE OPERATIONS MUST BE SUPERVISED BY AN EXPERIENCED BIOLOGIST AND COORDINATED WITH ODFW.
4. CALL BEFORE DIGGING 1-800-332-2344 (OR 811).
5. SCHEDULE CONSTRUCTION ACTIVITIES TO AVOID EARTH DISTURBING ACTIVITIES DURING WET WEATHER.
6. AVOID HIGHLY ERODIBLE AREAS SUCH AS STEEP SLOPES WHERE POSSIBLE.
7. CONSTRUCT STABILIZED ROAD ENTRANCES AND EXITS IN LOCATIONS WHERE EXPOSED SOIL OR NEWLY CONSTRUCTED ROADS INTERSECT EXISTING PAVED ROADS. STABILIZED CONSTRUCTION ENTRANCES AND EXITS SHALL BE INSPECTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION ACTIVITIES.
8. TO THE EXTENT PRACTICABLE EXISTING VEGETATION SHALL BE PRESERVED.
9. DUST SHALL BE CONTROLLED DURING CONSTRUCTION ACTIVITIES THROUGH WATER APPLICATION TO THE DISTURBED GROUNDS AND ACCESS ROADS WHERE NECESSARY. OTHER METHODS OF DUST CONTROL MAY INCLUDE BUT NOT BE LIMITED TO POLY SHEETING, VEGETATION OR MULCHING. SPEED LIMITS SHALL BE KEPT TO A MINIMUM TO PREVENT PULVERIZATION OF ROAD SURFACES.
10. FIBER ROLLS, SILT FENCE OR EQUIVALENT EROSION CONTROL METHODS SHALL BE INSTALLED DOWN GRADIENT OF CONSTRUCTION AREAS.
11. GRAVEL SHALL BE PLACED IN LOCATIONS WHERE SOIL BECOMES WET OR MUDDY TO PREVENT EROSION. MULCH SHALL BE PROVIDED TO IMMEDIATELY STABILIZE SOIL EXPOSED AS A RESULT OF CONSTRUCTION ACTIVITIES.
12. JUTE MESH, STRAW MATTING, OR TURF REINFORCEMENT MATTING SHALL BE USED TO STABILIZE SLOPES THAT BECOME EXPOSED DURING CONSTRUCTION ACTIVITIES.
13. SITE TO BE RESTORED TO EXISTING CONDITIONS UPON PROJECT COMPLETION.
14. TEMPORARY CROSSINGS SHALL BE INSPECTED AFTER HIGH FLOW EVENTS FOR ANY DAMAGES AND TO BE REPAIRED IMMEDIATELY TO AVOID ANY OBSTRUCTION IN FISH PASSAGE.

ABBREVIATIONS & ACRONYMS:

ALT	ALTERNATIVE
APPROX	APPROXIMATELY
BMPS	BEST MANAGEMENT PRACTICES
CY	CUBIC YARD
°	DEGREES
DEM	DIGITAL ELEVATION MODEL
DWG	DRAWING
ECO	ECOLOGY
EQUIV	EQUIVALENT
EXIST.	EXISTING
FT, '	FOOT
H	HORIZONTAL
HWY	HIGHWAY
IN, "	INCH
INC	INCORPORATED
KV	KILOVOLT
LIDAR	LIGHT DETECTION AND RANGING
LLC	LIMITED LIABILITY COMPANY
MAX	MAXIMUM
MIN	MINIMUM
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
ODFW	OREGON DEPARTMENT OF FISH AND WILDLIFE
PROP.	PROPOSED
PTR	PARTNER
TEMP	TEMPORARY
TYP	TYPICAL
USGS	UNITED STATES GEOLOGICAL SURVEY
V	VERTICAL
&	AND
%	PERCENT



FIBER ROLL DETAIL (TYP.)

(SCALE NTS)

FIBER ROLLS NOTES:

1. PREPARE SLOPE PRIOR TO INSTALLATION OF FIBER ROLLS. DIG SMALL TRENCHES ACROSS THE SLOPE ON CONTOUR TO PLACE FIBER ROLLS IN.
2. FIBER ROLLS SHALL BE PLACED PERPENDICULAR TO WATER MOVEMENT AND PARALLEL TO THE SLOPE CONTOUR.
3. STAKES SHALL BE 1" X 2" WOODEN STAKES.
4. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPES OR HIGHLY EROSIVE SOILS.
5. FIBER ROLLS OR WATTLES SHALL BE INSTALLED AT CONTOUR INTERVALS 10-30FT APART DEPENDING ON STEEPNESS OF SLOPE.

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B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

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GENERAL NOTES & EROSION CONTROL DETAILS

DWG. NO.: G - 002

CREATED: 10/28/2016

SHEET: 02 OF 23

SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C SHEET FILES COVER SHEET AND NOTES.DWG
PLOT DETAILS ANDREWS, JEREMY 1:24 PM

PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

N
W E
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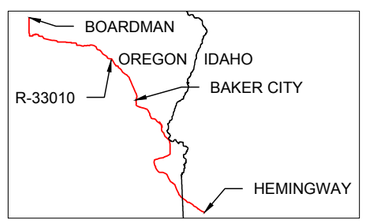
0' 50' 100'



MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 19FT.
4. STREAM GRADIENT AT CROSSING: 2-3% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GI2RLS. LLC.
6. SITE LOCATION: LATITUDE 45.2938°, LONGITUDE -118.1794°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33010 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

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BOARDMAN TO HEMINGWAY

CROSSING R-33010
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-101
CREATED: 11/14/2016
SHEET: 03 OF 23
SCALE: AS NOTED

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PLOT DETAILS: ANDREWS, JEREMY N:\m 11/28/2016 1:40 PM

N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING. STREAM AND ROAD TOPOGRAPHY TO BE FIELD VERIFIED PRIOR TO FINAL DESIGN.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER DESIGN STAGE AND FOR CONSTRUCTION.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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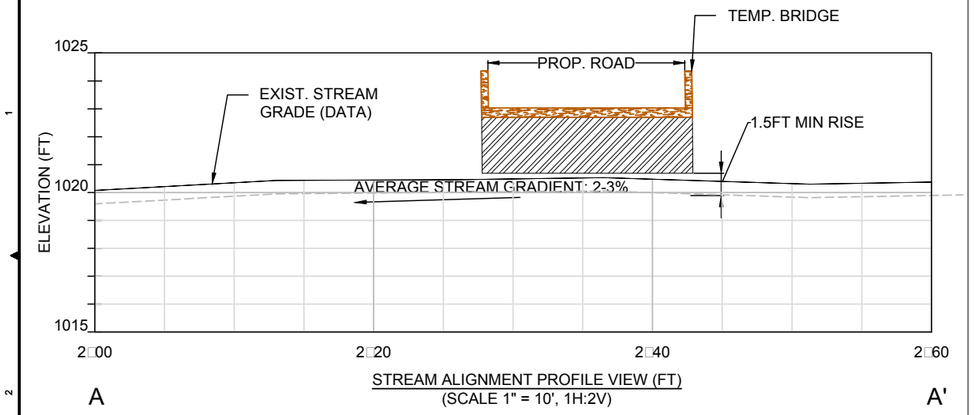
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

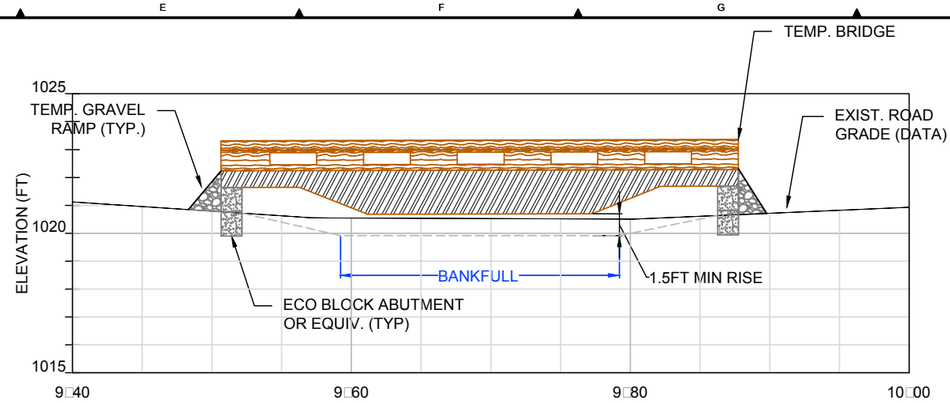
CROSSING R-33010
PROPOSED PLAN VIEW

DWG. NO.: C-102
CREATED: 11/14/2016
SHEET: 04 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES\R-33010.DWG
PLOT DETAILS: ANDREWS, JEREMY N:\ on 11-23-2016 1:20 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



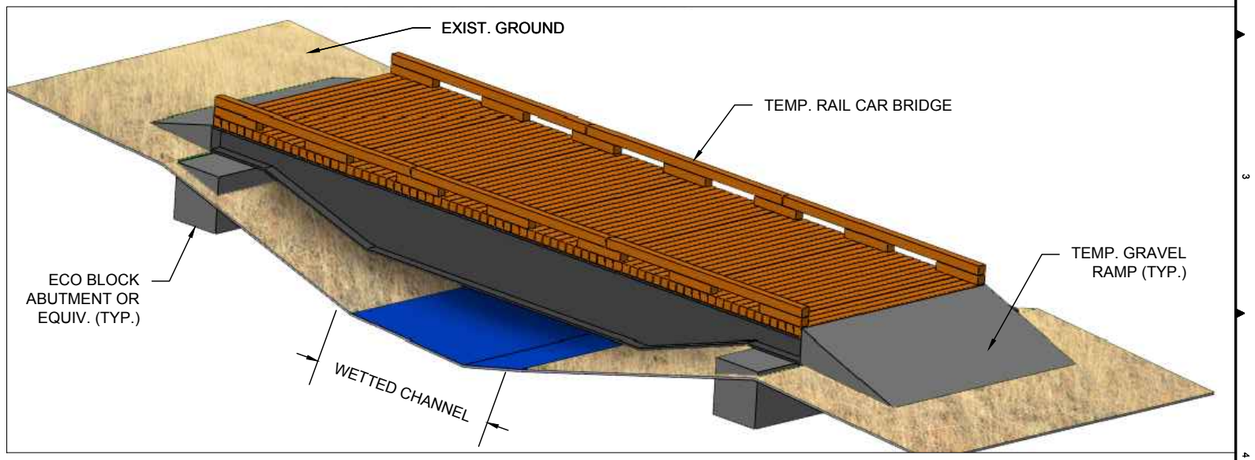
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR LITTLE ROCK CREEK 19 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETEMINED DURING FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

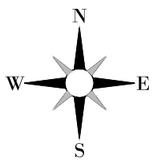
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33010
PLAN VIEWS AND DETAILS

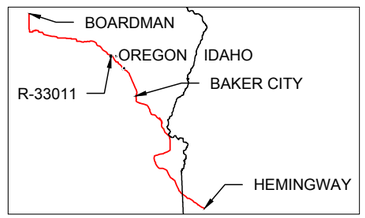
DWG. NO.: C-103
CREATED: 11/14/2016
SHEET: 05 OF 23
SCALE: AS NOTED

PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)



0' 50' 100'



MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013.
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GI2RLS. LLC.
6. SITE LOCATION: LATITUDE 45.2942°, LONGITUDE -118.1789°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33011 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	11/06/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33011
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-201
CREATED: 11/06/2016
SHEET: 06 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES\R-33011.DWG
PLOT DETAILS: ANDREWS, JEREMY N:\ | m | 23, 2016 1:21 PM

N
W E
S
0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER DESIGN STAGES AND CONSTRUCTION.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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NOT FOR CONSTRUCTION

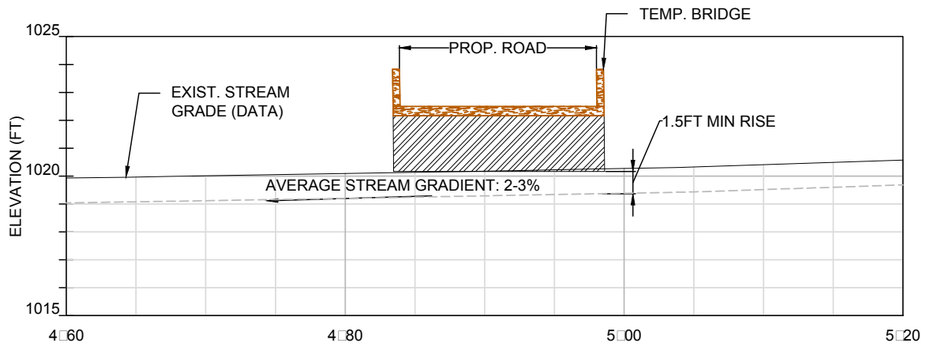
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	11/06/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

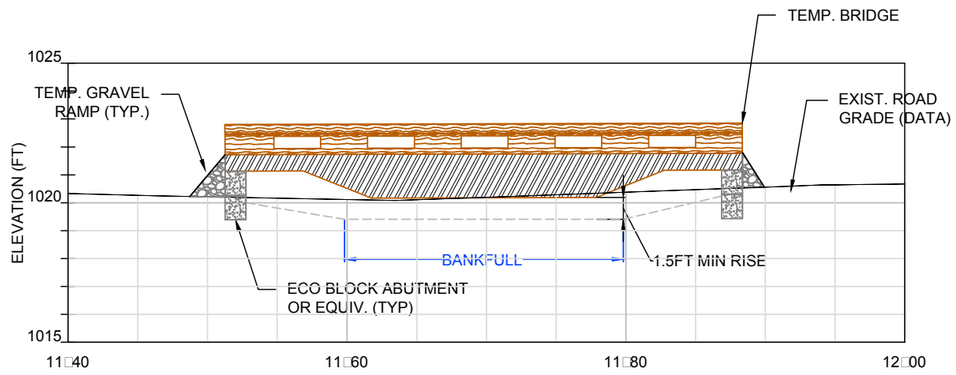
CROSSING R-33011
PROPOSED PLAN VIEW

DWG. NO.: C-202
CREATED: 11/06/2016
SHEET: 07 OF 23
SCALE: AS NOTED

Y:\CAD\PROJECTS\106-4422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES R-33011.DWG
PLOT DETAILS: ANDREWS, JEREMY N: \\m\...\23, 2016 1:22 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



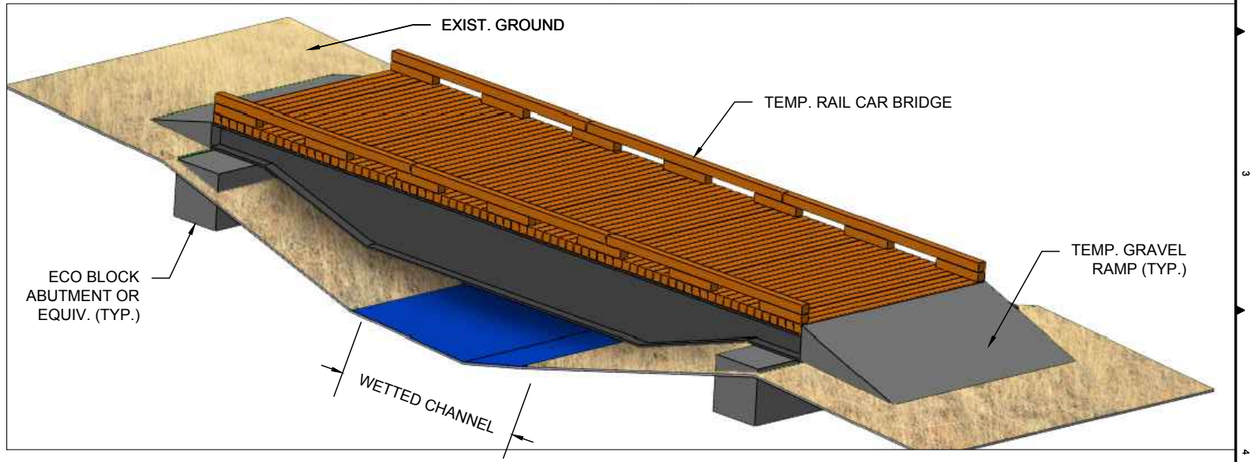
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETERMNED DURING FINAL FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	11/06/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

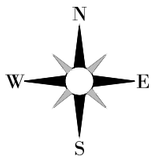
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33011
PLAN VIEWS AND DETAILS

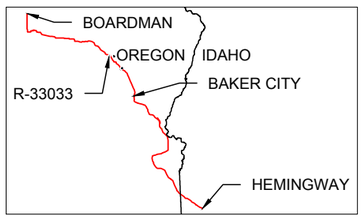
DWG. NO.: C-203
CREATED: 110/06/2016
SHEET: 08 OF 23
SCALE: AS NOTED

PHOTO - FACING EAST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)

PHOTO - FACING WEST (AUGUST '16)
FROM SITE R-33147 (SEE NOTE 7)



0' 50' 100'



MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. ASSUMED BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2% UNIFORM STREAM REACH.
5. PROPERTY OWNER: FOR THE GIRLS. LLC.
6. SITE LOCATION: LATITUDE 45.2920°, LONGITUDE -118.1727°.
7. PHOTOGRAPHS FROM SITE R-33147 ON ROCK CREEK NEAR CROSSING R-33033 ARE ASSUMED TO BE VISUALLY SIMILAR AND REPRESENTATIVE OF CROSSING CONDITIONS.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33033
EXISTING CONDITIONS
AND SITE PHOTOS

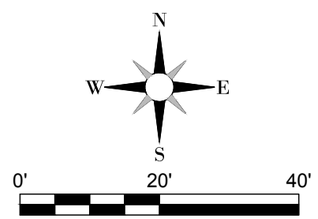
DWG. NO.: C-301

CREATED: 03/06/2015

SHEET: 9 OF 23

SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES R-33033.DWG
PLOT DETAILS: ANDREWS, JEREMY N | mi | 23, 2016 1:23 PM



NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND APPROXIMATELY 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FURTHER STAGES OF DESIGN AND CONSTRUCTION.

LEGEND:

- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — A' PROFILE EXTENTS

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33033
PROPOSED PLAN VIEW

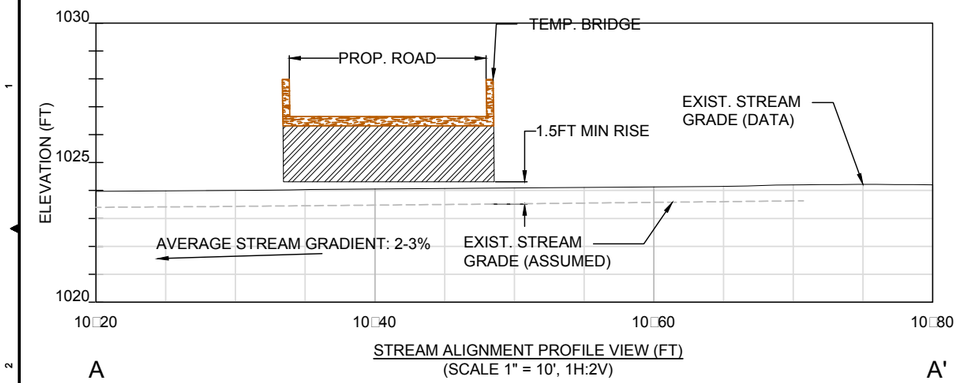
DWG. NO.: C-302

CREATED: 03/06/2015

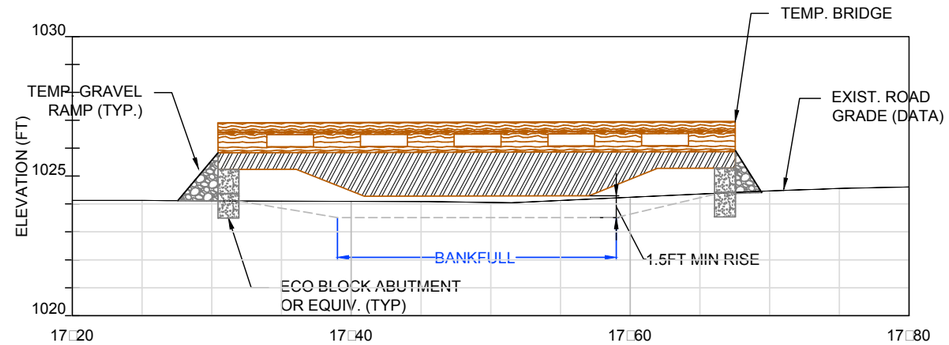
SHEET: 10 OF 23

SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES\R-33033.DWG
PLOT DETAILS: ANDREWS, JEREMY N 1:1.00 1:1 Fri, 28, 2016 1:43 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



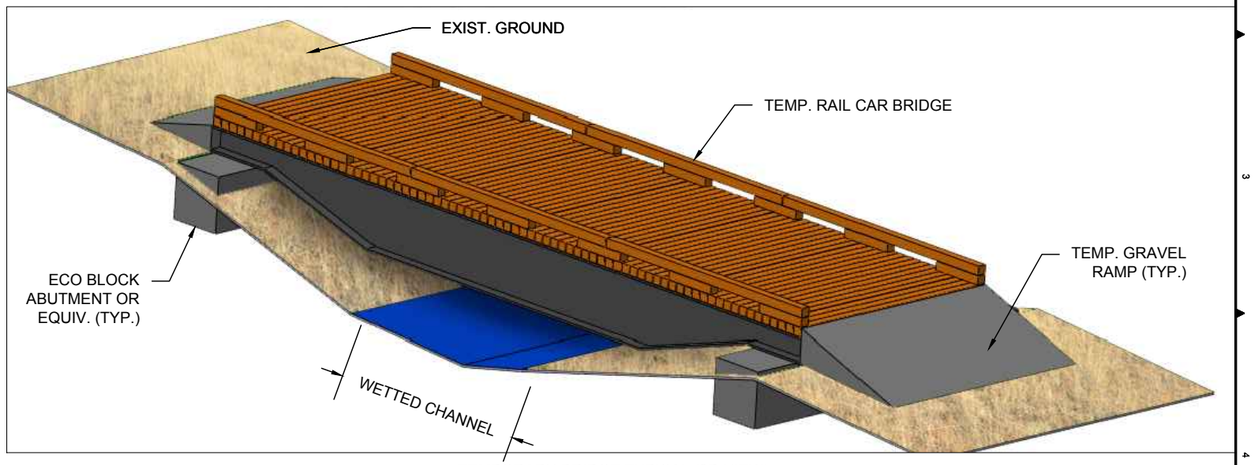
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE DETERMINED DURING FINAL FURTHER PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS. SITE TOPOGRAPHY WILL BE REFINED AT LATER STAGES OF DESIGN.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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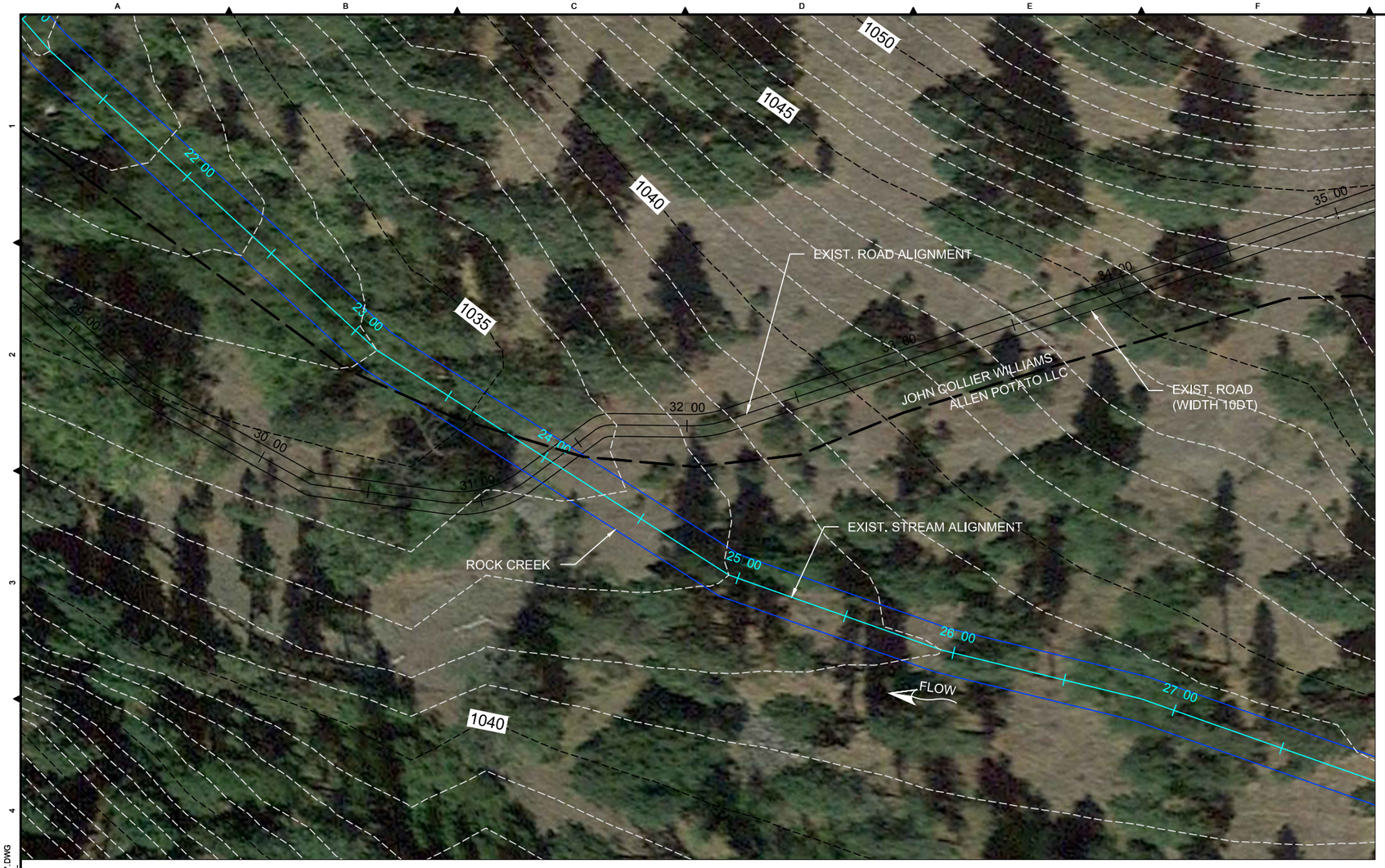
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016 DESIGN	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33033
PLAN VIEWS AND DETAILS

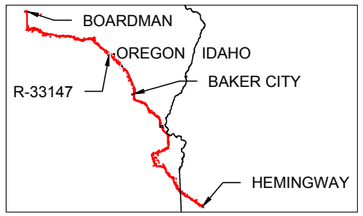
DWG. NO.: C-303
CREATED: 11/08/2016
SHEET: 11 OF 23
SCALE: AS NOTED



SITE PHOTO - FACING EAST (AUGUST '16)

SITE PHOTO - FACING WEST (AUGUST '16)

N
W E
S
0' 50' 100'



MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 08/30/2013
2. TOPOGRAPHIC DATA SOURCE: USGS LIDAR, APPROXIMATELY 10 METER RESOLUTION.
3. BANKFULL WIDTH: 20FT.
4. STREAM GRADIENT AT CROSSING: 2-3% UNIFORM STREAM REACH.
5. PROPERTY OWNER: JOHN COLLIER WILLIAMS.
6. SITE LOCATION: LATITUDE 45.2920°, LONGITUDE -118.1727°.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-33147
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-401
CREATED: 10/28/2016
SHEET: 12 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H\PRELIMINARY DESIGN - REV C\SHEET FILES R-33147.DWG
PLOT DETAILS: ANDREWS, JEREMY
PLOT TIME: Nov 21, 2016 - 8:02 AM

N
W E
S
0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 5FT
- EXISTING MINOR CONTOUR - 1FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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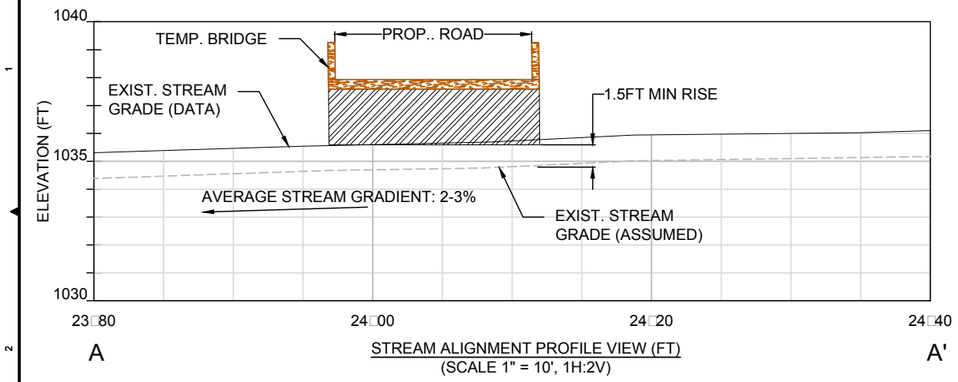
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

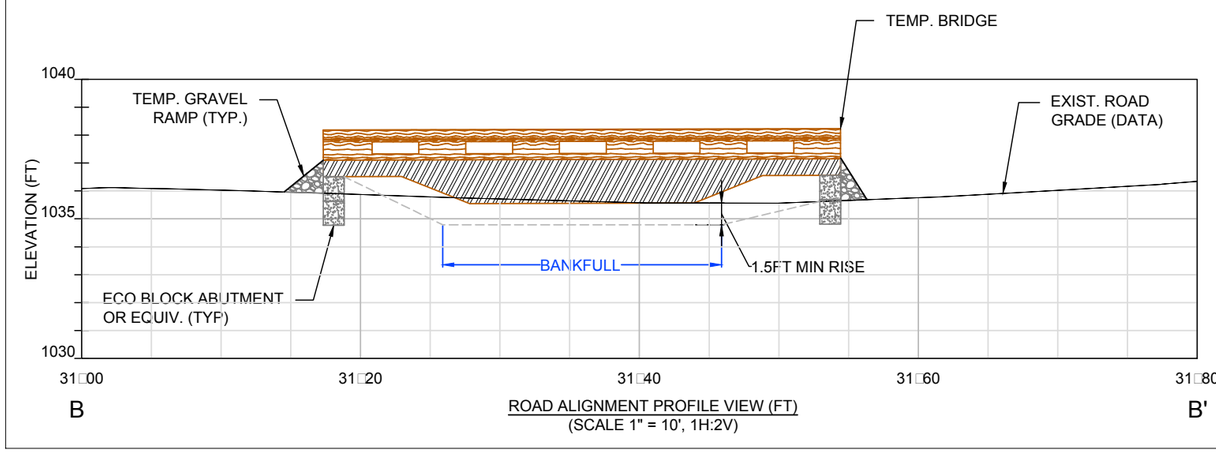
CROSSING R-33147
PROPOSED PLAN VIEW

DWG. NO.: C-402
CREATED: 10/28/2016
SHEET: 13 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 BJH\PRELIMINARY DESIGN - REV C\SHEET FILES R-33147.DWG
PLOT DETAILS: ANDREWS, JEREMY N | m | 21, 2016 8:02 AM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



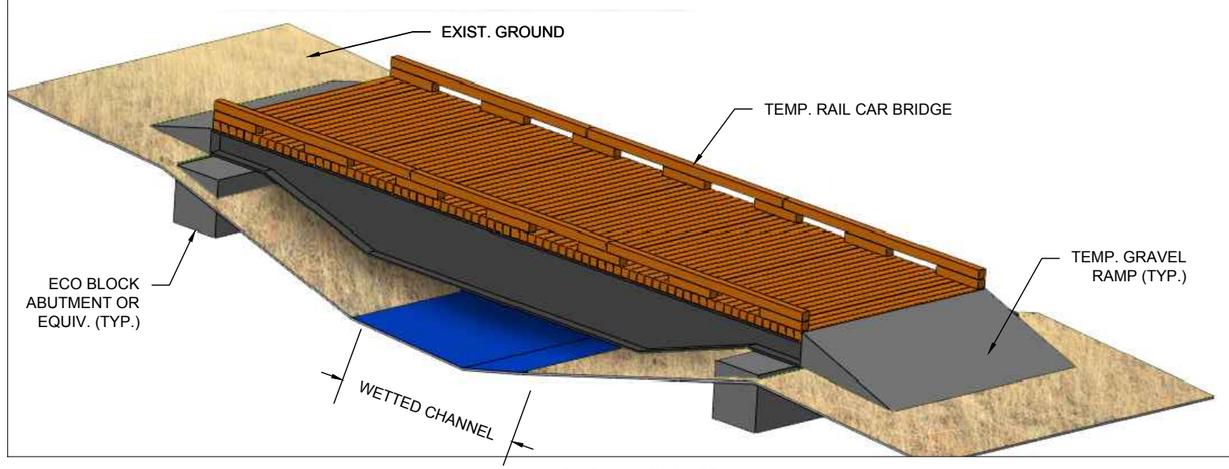
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR ROCK CREEK IS 20 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING. STREAM CHANNEL TOPOGRAPHY TO BE VERIFIED DURING FINAL PHASES OF DESIGN.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 10 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

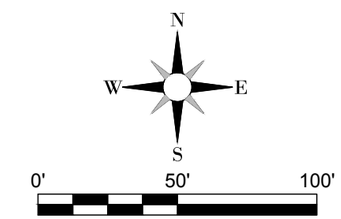
IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

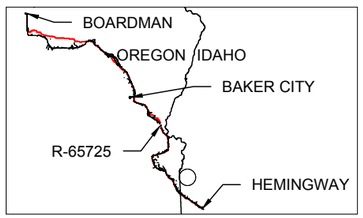
CROSSING R-33147
PLAN VIEWS AND DETAILS

DWG. NO.: C-403
CREATED: 10/28/2016
SHEET: 14 OF 23
SCALE: AS NOTED

SITE PHOTO - FACING UPSTREAM (AUGUST '16)

SITE PHOTO - FACING DOWNSTREAM (AUGUST '16)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 8/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 8FT.
4. STREAM GRADIENT AT CROSSING: 5% UPSTREAM AND 9% DOWNSTREAM OF STREAM CROSSING.
5. PROPERTY OWNER: DURBIN CREEK RANCHES PTR.
6. SITE LOCATION: LATITUDE 44.3994°, LONGITUDE -117.3393°.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-65725
EXISTING CONDITIONS AND SITE PHOTOS

DWG. NO.: C-501
CREATED: 10/30/2016
SHEET: 15 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES\R-65725.DWG
PLOT DETAILS: ANDREWS, JEREMY N. on: Jul 17, 2016 - 1:41 PM

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 3 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT AND 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

N W E S

0' 20' 40'

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IDAHO POWER
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NOT FOR CONSTRUCTION

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-65725
EXISTING CONDITIONS
AND SITE PHOTOS

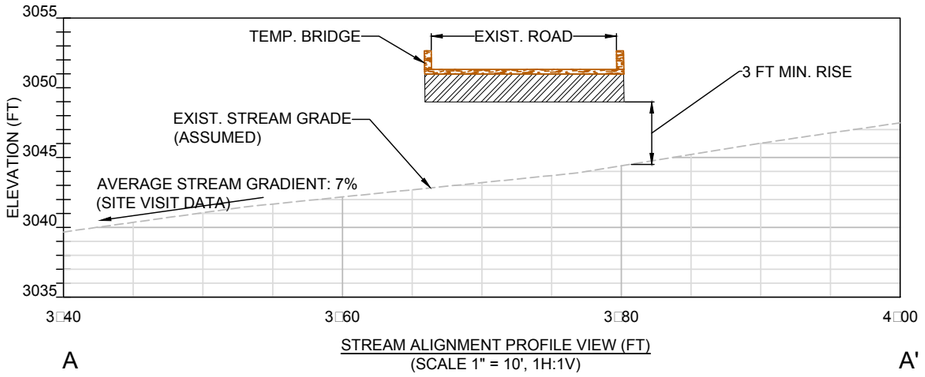
DWG. NO.: C-502

CREATED: 10/30/2016

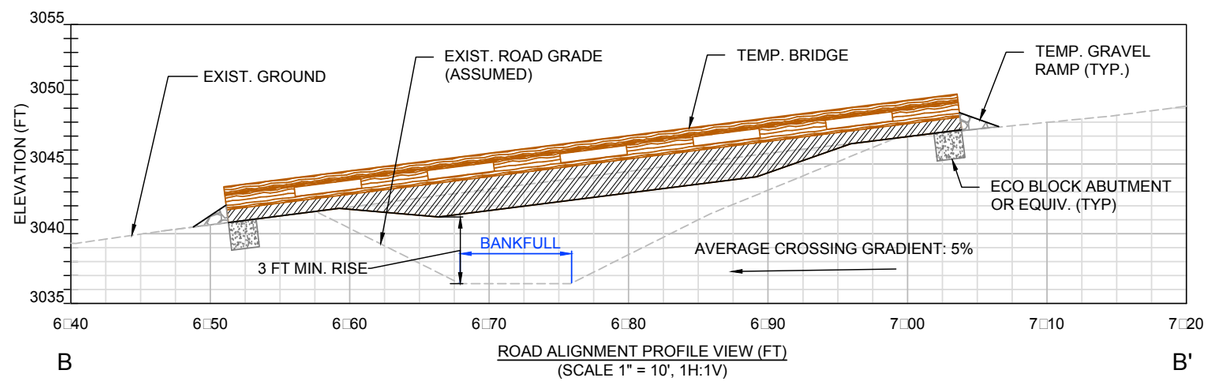
SHEET: 16 OF 23

SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C: SHEET FILES R-65725.DWG
PLOT DETAILS: ANDREWS, JEREMY N - Jan 17, 2016 1:41 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)



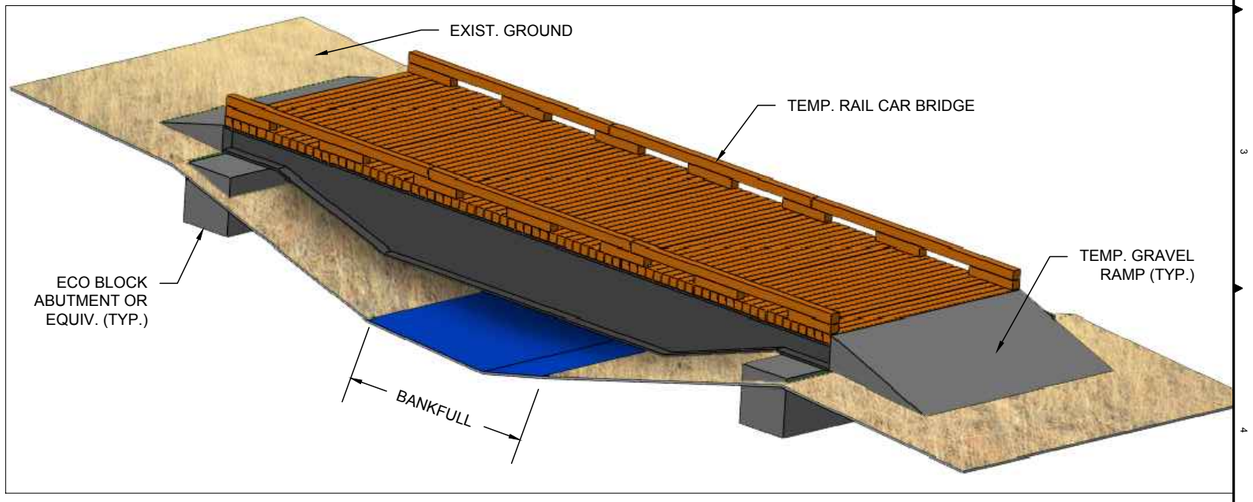
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN BANKFULL CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. PLACE ABUTMENTS 5 FT MIN. OUTSIDE OF BANKFULL AND TEMPORARY BRIDGE WITH MIN. 3 FT RISE.
3. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
4. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
5. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENTS AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

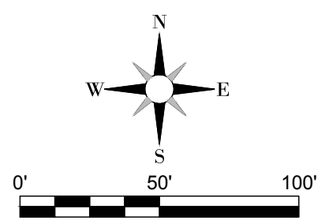
CROSSING R-65725
EXISTING CONDITIONS
AND SITE PHOTOS

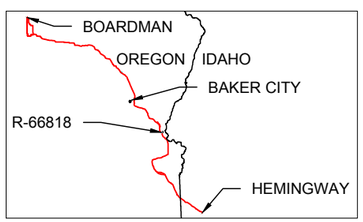
DWG. NO.: C-503
CREATED: 10/30/2016
SHEET: 17 OF 23
SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C: SHEET FILES R-65725.DWG
PLOT DETAILS: ANDREWS, JEREMY N. on 11 7 2016 1:41 PM

SITE PHOTO - FACING EAST (JUNE '16)

SITE PHOTO - FACING WEST (JUNE '16)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE MAPS 10/28/16.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 6 FT.
4. STREAM GRADIENT AT CROSSING: 4% UPSTREAM AND 12% DOWNSTREAM OF CROSSING.
5. PROPERTY OWNER: DAVIS, GARY R. & LOIS A.
6. SITE LOCATION: LATITUDE 44.3734°, LONGITUDE -117.3050°.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- PROPERTY LINE

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/30/16	PRELIMINARY DESIGN - 2016	JSA	JSA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-66818
EXISTING CONDITIONS
AND SITE PHOTOS

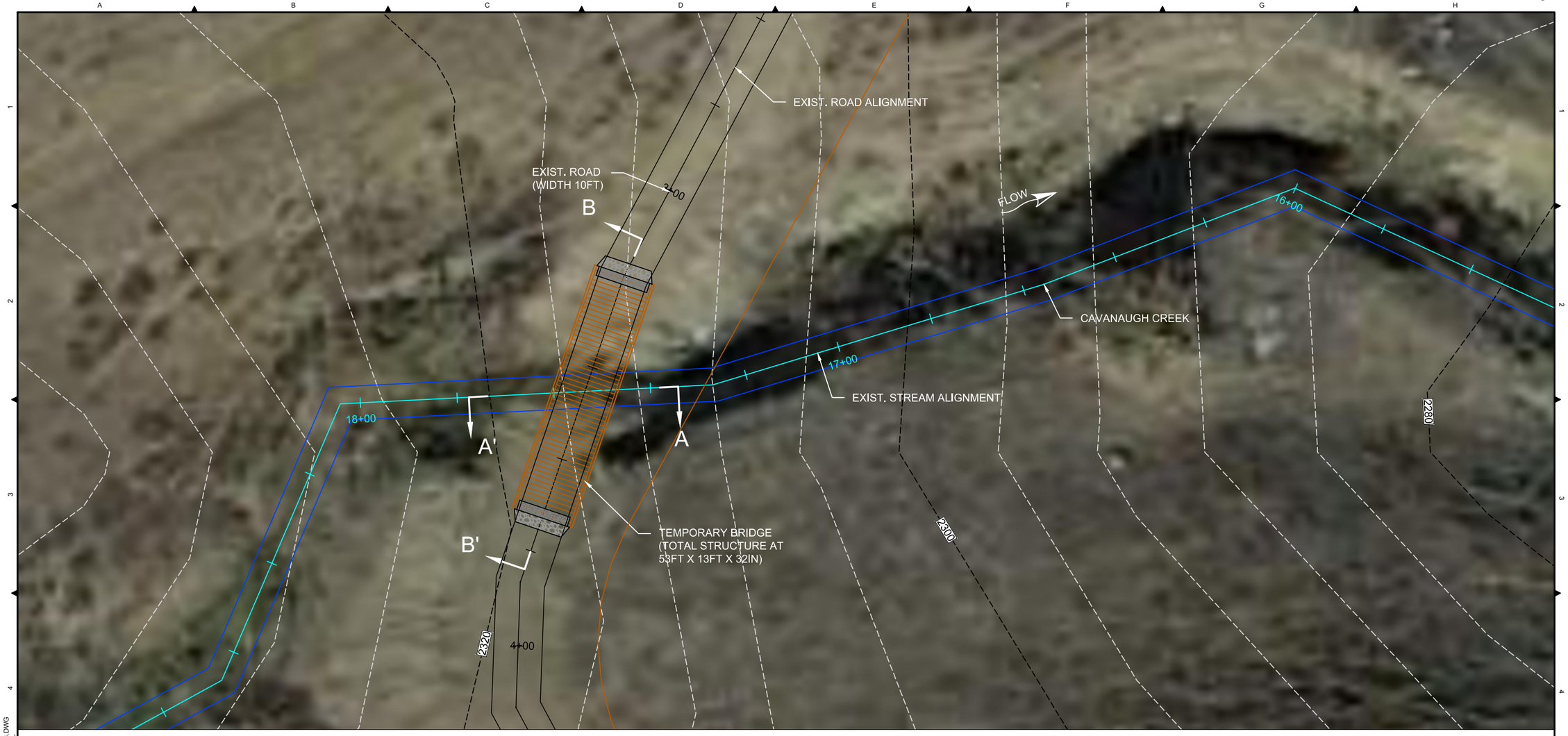
DWG. NO.: C-601

CREATED: 10/30/2016

SHEET: 18 OF 23

SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C SHEET FILES R-66818.DWG
PLOT DETAILS: ANDREWS, JEREMY N - 10/27/2016 1:43 PM



N
W E
S

0' 20' 40'

NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 3 CY OF CUT, 3 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 20FT
- EXISTING MINOR CONTOUR - 4FT
- BANKFULL WIDTH
- A — PROFILE EXTENTS

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/30/16	PRELIMINARY DESIGN - 2016	JSA	JSA		
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-66818
PROPOSED PLAN VIEW

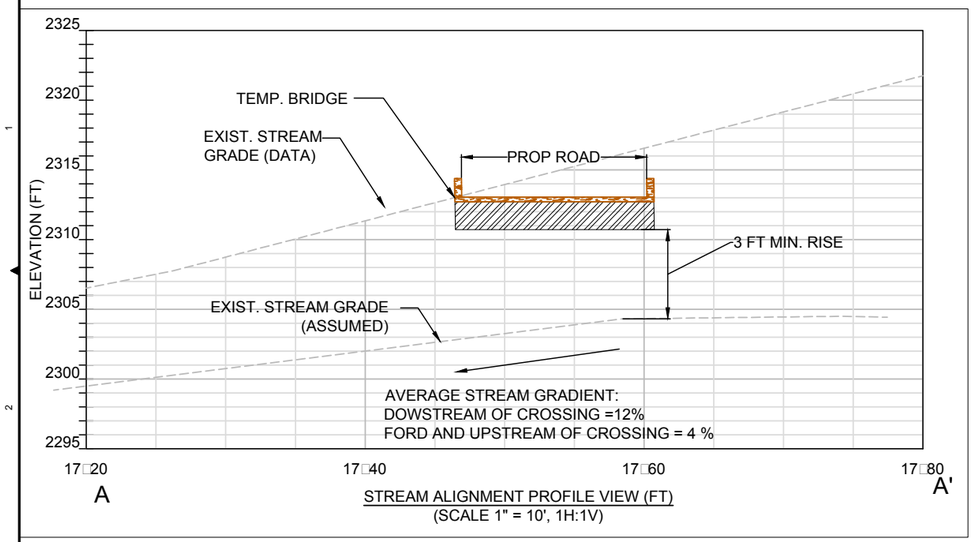
DWG. NO.: C-602

CREATED: 10/30/2016

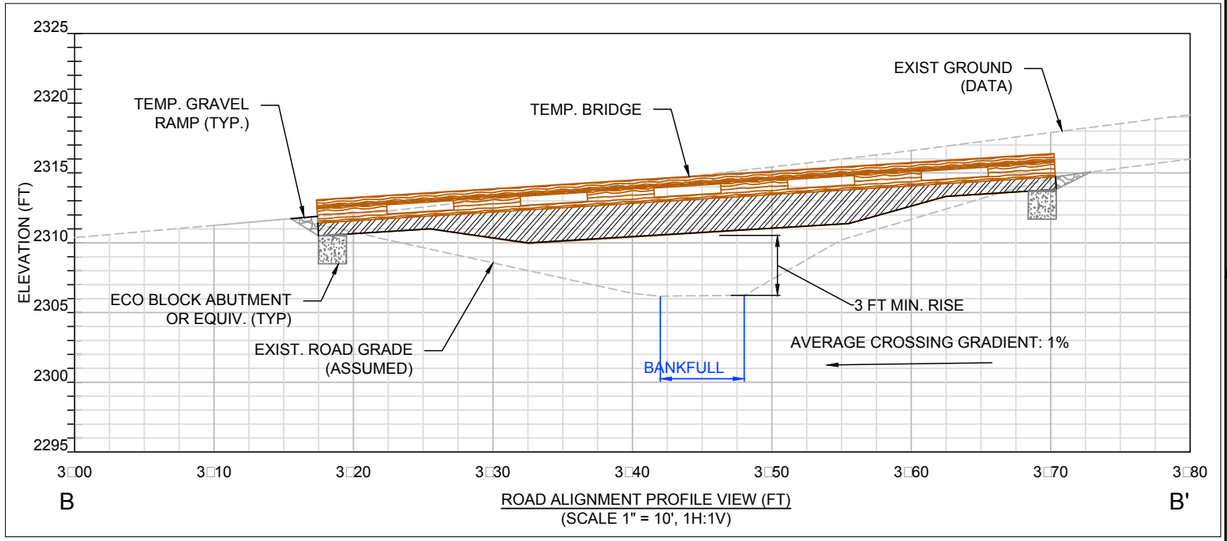
SHEET: 19 OF 23

SCALE: AS NOTED

Y: CAD PROJECTS:106-4422 B2H PRELIMINARY DESIGN - REV C: SHEET FILES R-66818.DWG
PLOT DETAILS: ANDREVOS, JEREMY N on 11-17-2016 1:43 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)



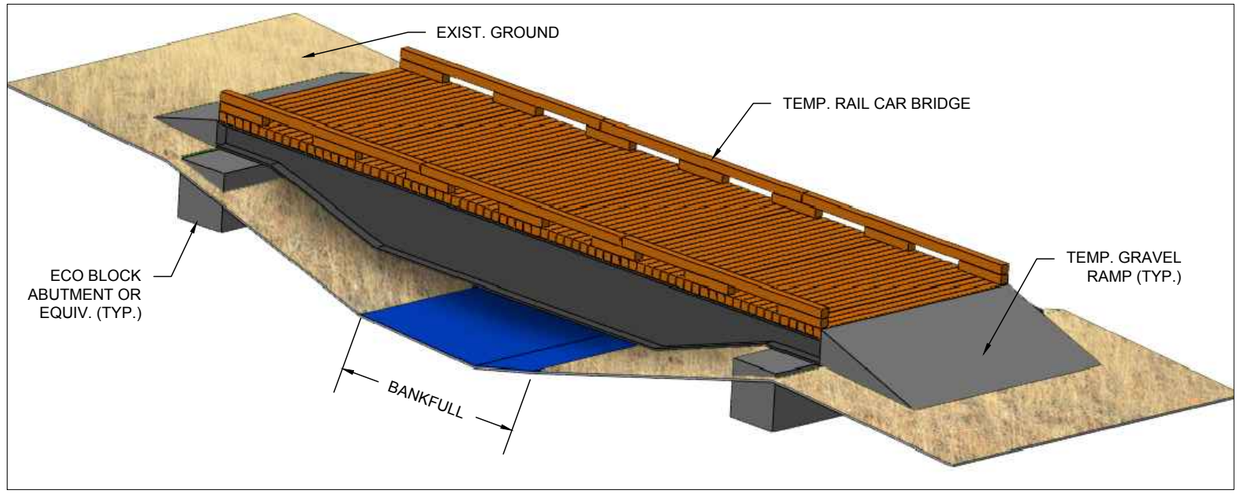
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:1V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN BANKFULL CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. PLACE ABUTMENTS 5 FT MIN. OUTSIDE OF BANKFULL AND TEMPORARY BRIDGE WITH MIN. 3 FT RISE.
3. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
4. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
5. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENTS AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/30/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

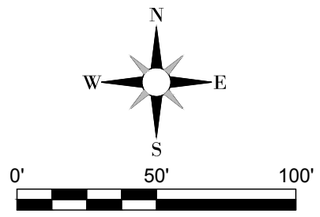
CROSSING R-66818
PLAN VIEWS AND DETAILS

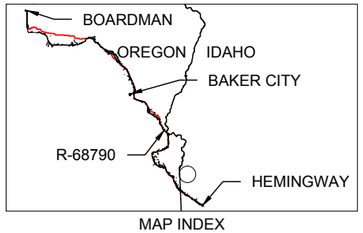
DWG. NO.: C-603
CREATED: 10/28/2016
SHEET: 20 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES R-66818.DWG
PLOT DETAILS: ANDREWS, JEREMY N | m | 1/17/2016 1:23 PM

SITE PHOTO - FACING NORTH (MAY '14)

SITE PHOTO - FACING NORTH (MAY '14)





MAP INDEX

NOTES:
1. IMAGERY SOURCE: GOOGLE EARTH, 8/30/13.
2. TOPOGRAPHIC DATA SOURCE: USGS DEM, APPROXIMATELY 30 METER RESOLUTION.
3. BANKFULL WIDTH: 18FT.
4. STREAM GRADIENT AT CROSSING: <1% UNIFORM STREAM REACH.
5. PROPERTY OWNER: AGAR, BREWSTER V & MARY L ET AL.
6. SITE LOCATION: LATITUDE 44.3134°, LONGITUDE -117.2652°.

LEGEND:
- EXISTING MAJOR CONTOUR - 10FT
- EXISTING MINOR CONTOUR - 2FT
- BANKFULL WIDTH
- PROPERTY LINE

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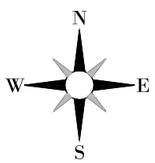
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/30/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-68790
EXISTING CONDITIONS
AND SITE PHOTOS

DWG. NO.: C-701
CREATED: 03/08/2016
SHEET: 21 OF 23
SCALE: AS NOTED

Y:\CAD PROJECTS\106-4422 B2H PRELIMINARY DESIGN - REV C\SHEET FILES R-68790.DWG
PLOT DETAILS: ANDREWS, JEREMY N | m | 17, 2016 1:30 PM



NOTES:

1. PROPOSED CROSSING TYPE: TEMPORARY RAIL BRIDGE.
2. ALIGNMENT OF CENTER TEMPORARY RAIL BRIDGE TO BE APPROXIMATELY PERPENDICULAR TO STREAM FOR THIS CROSSING.
3. EXCAVATION DURING CONSTRUCTION REQUIRES 0 CY OF CUT/FILL WITHIN BANKFULL WIDTH OF STREAM AND 2 CY OF FILL OUTSIDE BANKFULL AS TEMPORARY BASE AND GRAVEL RAMP.
4. ALL EFFECTIVE EROSION CONTROL MEASURES AND SEDIMENT BARRIERS FOR THE ROAD APPROACHES TO THE CHANNEL CROSSING WILL BE EVALUATED AND PLANNED AS NECESSARY DURING FINAL DESIGN FOR CONSTRUCTION AND POST-CONSTRUCTION PURPOSES.

LEGEND:
- EXISTING MAJOR CONTOUR - 10FT
- EXISTING MINOR CONTOUR - 2FT
- BANKFULL WIDTH
- PROPERTY LINE
- A PROFILE EXTENTS

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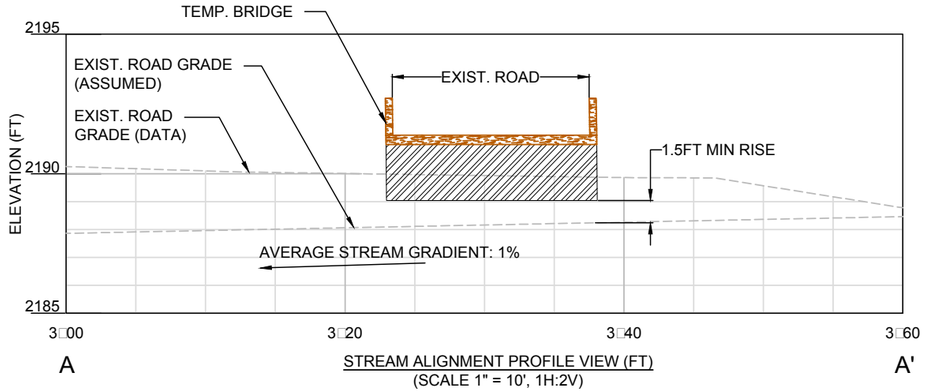
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JS	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

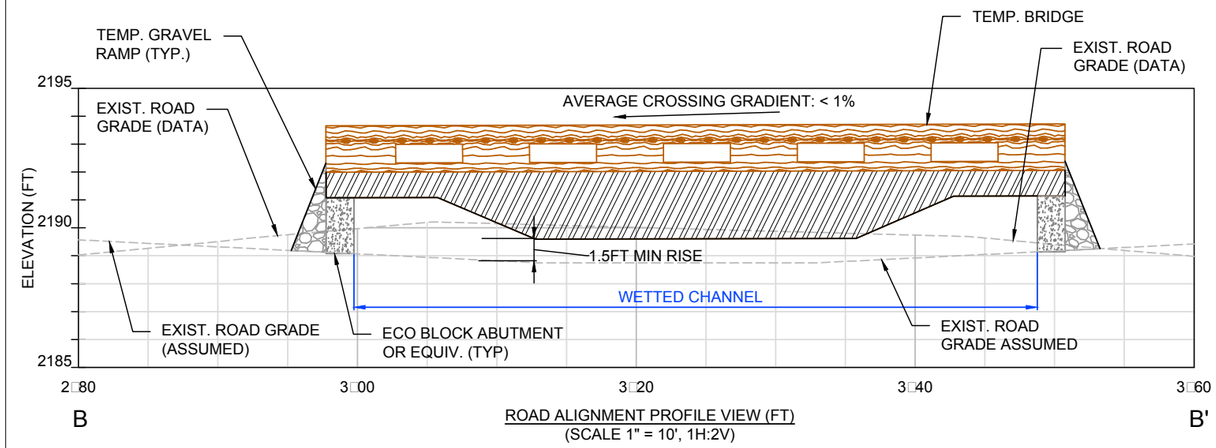
CROSSING R-68790
PROFILE VIEWS AND DETAILS

DWG. NO.: C-702
CREATED: 10/28/2016
SHEET: 22 OF 23
SCALE: AS NOTED

Y: CAD PROJECTS 108-422 B2H PRELIMINARY DESIGN - REV C: SHEET FILES R-68790.DWG
PLOT DETAILS: ANDREWS, JEREMY N: m 17 2016 1:50 PM



STREAM ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)



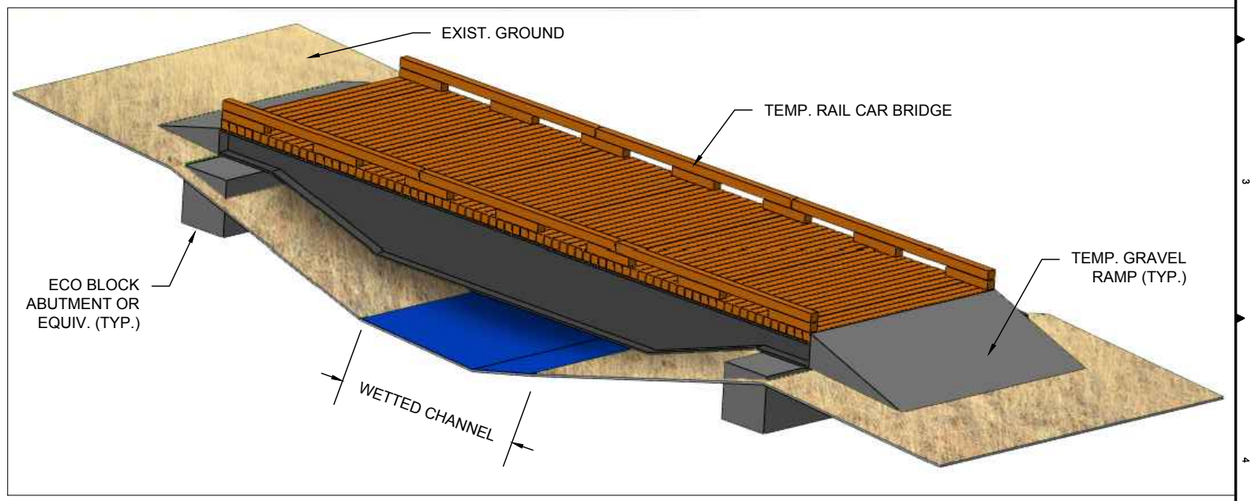
ROAD ALIGNMENT PROFILE VIEW (FT)
(SCALE 1" = 10', 1H:2V)

NOTES:

1. TEMPORARY BRIDGE WILL SPAN WETTED CHANNEL AND NOT REQUIRE SUPPORT IN CENTER OF CHANNEL.
2. AVERAGE BANKFULL WIDTH FOR BENSON CREEK OUTSIDE OF FORD IS 18 FEET. WIDTH SHOWN IN SECTIONS IS WETTED CHANNEL WIDTH AT CROSSING.
3. PLACE ABUTMENTS OUTSIDE OF WETTED CHANNEL AND TEMPORARY BRIDGE WITH MIN. 1.5 FT RISE.
4. PLACE TEMPORARY CLEAN ANGULAR ROCK FILL OR EQUIVALENT AS TEMPORARY BASE AND GRAVEL RAMP AS NEEDED OUTSIDE OF BANKFULL AND WETTED CHANNEL WIDTH TO EASE VEHICULAR TRANSITION FROM GROUND ONTO BRIDGE.
5. EXCAVATION MAY BE REQUIRED OUTSIDE OF BANKFULL WIDTH IN ORDER TO MINIMIZE CROSS AND LONGITUDINAL GRADIENTS FOR SAFE VEHICULAR CROSSING. THESE GRADIENTS WILL BE DETERMINED DURING FINAL PHASES OF THE DESIGN.
6. DURING BRIDGE INSTALLATION, IF SOFT GROUND CONDITIONS ARE FOUND, ECO BLOCK ABUTMENT AND BASE MATERIAL MAY NEED TO BE REVISED PER ENGINEER'S APPROVAL.

GENERAL NOTE:

1. EXISTING GROUND (DATA) FROM 30 METER DEM DID NOT MATCH FIELD SURVEY CONDITIONS. EXISTING GROUND (ASSUMED) WAS DRAWN TO MATCH FIELD CONDITIONS.



TEMPORARY BRIDGE TYPICAL (3D VIEW)
(SCALE NTS)

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK	APP
C	10/28/16	PRELIMINARY DESIGN - 2016	JA	JA	AS	SO
B	08/28/15	PRELIMINARY DESIGN - ODFW COMMENTS AND INDICATIVE DESIGN CHANGES	FM	NV	AS	SO
A	3/30/15	PRELIMINARY DESIGN	WB	NV	AS	SO

IDAHO POWER COMPANY
BOARDMAN TO HEMINGWAY

CROSSING R-68790
PROFILE VIEWS AND DETAILS

DWG. NO.: C-703
CREATED: 10/28/2016
SHEET: 23 OF 23
SCALE: AS NOTED

Y: CAD PROJECTS 106-4422 B2H PRELIMINARY DESIGN - REV C: SHEET FILES R-68790.DWG
PLOT DETAILS: ANDREWS, JEREMY N: on 11 07 2016 1:30 PM