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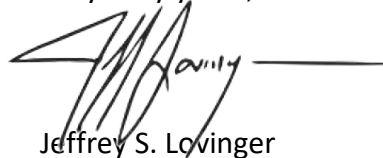
**Re: In the Matter of Marquam Creek Solar, LLC
PUC Case No. UM 1631**

Attention Filing Center:

Enclosed for filing today in the above-named docket is Portland General Electric Company's Comments on Marquam Creek Solar, LLC's Petition for Waiver.

Thank you for your assistance.

Very truly yours,


Jeffrey S. Lovinger

Attachment
1125069

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON
UM 1631**

In the Matter of
Marquam Creek Solar, LLC,
Petition for Waiver of
OAR 860-082-0025(1)(c)

**PORTLAND GENERAL
ELECTRIC COMPANY'S
COMMENTS ON MARQUAM
CREEK SOLAR, LLC'S
PETITION FOR WAIVER**

I. INTRODUCTION

Portland General Electric Company (“PGE”) respectfully submits these comments on the petition for waiver (“Waiver Petition”) filed by Marquam Creek Solar LLC (“Marquam Creek”) on January 25, 2021. PGE does not support or oppose the Petition. Instead, PGE submits these comments to aid the Public Utility Commission of Oregon (“Commission”) in evaluating the impact of granting or denying the Waiver Petition.

The Waiver Petition asks the Commission to waive one of the Commission’s small generator interconnection rules. Specifically, Marquam Creek asks the Commission to waive OAR-860-082-0025(1)(c). That rule provides that when an interconnection applicant modifies the nameplate capacity rating of its generation facility, the applicant must file a new application to interconnect and the new application will be assigned a new queue position at the bottom of the interconnection queue.

Marquam Creek asks the Commission to waive OAR 860-082-0025(1)(c) so that Marquam Creek can: (a) reduce the nameplate capacity rating of its generator by approximately 100-kilowatts (“kW”) from 2 MW to 1.9 MW; (b) thereby avoid the need to pay for system upgrades (3VO, transfer trip, and pole replacement) that would otherwise be required for safety and reliability reasons; and (c) remain in the top queue position to interconnect to PGE’s Scotts-Mills-13 feeder. Granting the Waiver Petition is likely to benefit Marquam Creek by allowing it

to avoid approximately \$3,437,837 in interconnection costs (the estimated cost for 3VO sensing, transfer trip, and associated pole replacement for the Marquam Creek project). However, granting the Waiver Petition is likely to harm lower-queued interconnection request SPQ0247 by increasing its interconnection protection costs to approximately \$1,100,000 (as compared to SPQ0247's current estimated protection costs of \$540,000 if Marquam Creek remains at 2.0 MW and interconnects in the first queue position, or as compared to SPQ0247's likely protection costs of \$0 if the Waiver Petition is denied and Marquam Creek withdraws its interconnection request). PGE's summary of the anticipated cost impacts on both parties is:

Scenario	Marquam Protection Cost*	SPQ247 Protection Cost*
Waiver Request Denied—Marquam constructed first at original size/SPQ0247 constructed second	\$3.7 million	\$540,000
Waiver Request Denied—Marquam constructed second at reduced size /SPQ0247 constructed first	\$3.7 million	\$0
Waiver Request Denied—Marquem withdraws/SPQ0247 constructed first	\$0	\$0
Waiver Request Granted—Marquam constructed first at reduced size/SPQ0247 constructed second	\$321,000	\$1.1 million

* Costs listed are estimated cost of the protection measures at issue in the Waiver Petition (hot line blocking, 3VO sensing, transfer trip, associated pole replacement). Both projects will incur other interconnection costs not at issued in the Waiver Petition and not identified here (e.g., distribution modifications).

Granting the waiver is also likely to result in the Commission receiving an increased number of petitions for waiver of OAR 860-082-0025(1)(c) as other interconnection applicants seek to “right size” their projects without losing their queue position. The Commission should consider whether it is prepared to entertain repeated petitions for waiver of OAR 860-082-0025(1)(c), and if so, what principles it will employ to decide when a waiver is in the public interest. If the Commission concludes that the Waiver Petition highlights certain interconnection concerns that need to be addressed, the Commission should consider whether those concerns are better addressed on a prospective basis through revisions to the underlying interconnection process or rules rather than through a series of ad-hoc waiver requests.

Finally, PGE has had to repeatedly re-study requests to interconnect to the Scotts Mills-13 feeder because several higher-queued interconnection requests have been withdrawn. This need to re-study interconnection requests when higher-queued applications are withdrawn is not the fault of the applicants or of PGE; rather, it is a consequence of the serial interconnection study process established by the Commission's small generator interconnection rules. PGE is interested in reducing the challenges associated with repeated re-study of interconnection requests. PGE is looking forward to working with Staff and stakeholders to explore the possibility of interconnection queue reform to address some of those challenges on a going forward basis; however, PGE does not believe that changes to the queue process would or should address the specific issues addressed in the Waiver Petition.

II. COMMENTS

A. The Commission's rules establish a serial interconnection process.

Under the Commission's interconnection rules, PGE is required to study interconnection requests in the order received. Lower-queued projects are studied with the assumption that all higher-queued interconnection requests will be completed, and that PGE will install the interconnection facilities and system upgrades required as part of each higher-queued interconnection. Under this approach, if a higher-queued project withdraws from the queue, it may be necessary to re-study the lower-queued interconnection requests because the original assumption that the higher-queued project will be completed has changed.

The need to re-study lower-queued applications after a higher-queued application is withdrawn can lead to a cascade of re-studies. For example, if Project A is in the highest queue position and is required to pay for a system upgrade that will benefit Project A and all subsequent interconnection applicants, then lower-queued Projects B and C will not be required to pay for the

protective upgrade (because the upgrade will already be installed as part of the interconnection work on Project A). However, if Project A withdraws, then Projects B and C will need to be re-studied. In the re-study, the utility may conclude that Project B needs to pay for the upgrade and that Project C will not need to pay for an upgrade (because the upgrade will already be installed as part of the interconnection work for Project B). If Project B then withdraws because of the cost of the upgrade, it becomes necessary to perform another re-study of the interconnection for Project C, and the utility may conclude that Project C needs to pay for the system upgrade. There are a number of distribution feeders on PGE's system that have experienced this phenomenon; the Scotts-Mills-13 feeder is one such feeder.

B. PGE's two-stage approach to protection from backfeed.

When generators apply to interconnect to a PGE distribution feeder, PGE must consider whether the "aggregate generation" capacity¹ on the feeder will exceed the "daytime minimum load"² associated with the feeder. If aggregate generation exceeds daytime minimum load of the substation transformer, then power can "backfeed" from the distribution feeder across the substation transformer and onto PGE's transmission system, which can, under certain conditions, cause catastrophic damage to PGE's system. To prevent this outcome, PGE employs a two-stage approach to backfeed protection.³

¹ As used here, "aggregate generation" capacity refers to the sum of the nameplate capacity ratings of: (a) all existing generation on the feeder (including net metering solar PV generation); (b) all higher-queued generation that has applied to interconnect to the feeder; and (c) the generator under study.

² "Daytime minimum load" refers to a historical measure of the minimum load, either on the substation transformer or the feeder. PGE considers minimum load information during daytime hours (load conditions between 9AM and 5PM) because the generation sources under consideration are solar photovoltaic facilities and do not generate at night.

³ See *In the Matter of Portland General Electric Company, Request for Approval of Agreement for Net Metering and Interconnection Services*, Docket No. UM 2099, PGE Request (May 21, 2020) (available at <https://edocs.puc.state.or.us/efdocs/HAA/haa132813.pdf>), Staff Comments (Aug. 21, 2020) (available at <https://edocs.puc.state.or.us/efdocs/HAC/um2099hac14911.pdf>), and PGE Reply Comments (Sep. 22, 2020) (available at <https://edocs.puc.state.or.us/efdocs/HAC/um2099hac154013.pdf>) for a discussion of PGE's approach to protecting against backfeed from generation interconnecting to a distribution feeder.

First, if the aggregate generation is anticipated to exceed 90 percent of the daytime minimum load of the feeder, then PGE requires that the applicant pay for a protective scheme on the distribution feeder known as “hot line blocking.” This approach will prevent automatic reclosing of breakers on the feeder until generation on the feeder responds properly to a fault by ceasing to energize. The cost of hot line blocking is typically in the tens of thousands of dollars. Hot line blocking must be installed in response to the first generator to cause aggregate generation to exceed 90 percent of the daytime minimum load.

Second, if the aggregate generation is anticipated to be more than 100 percent of the substation transformer daytime minimum load (for Tap or Line Control substations), then PGE requires that the applicant pay for protective scheme known as “3VO sensing.” 3VO sensing is installed in the substation for the substation transformer serving the feeder. It allows the system to rapidly detect and mitigate damage from overvoltage if generation from the feeder backfeeds through the substation transformer when there is a fault on the high side of the substation transformer. The cost of 3VO sensing is typically in the hundreds of thousands of dollars. Once 3VO sensing is installed for the substation transformer serving the feeder, the improvement will serve all subsequent generation added to the feeder. However, once 3VO sensing is required, the generator triggering the requirement and all subsequent generation on the feeder will need to pay for “transfer trip” which will allow the system to “trip off” the generator(s) under appropriate circumstances.⁴ Transfer trip requires the installation of a fiber optic cable from the substation to the point of interconnection. In some cases, poles will need to be modified or replaced due to the

⁴ The transfer trip requirement typically includes fiber optic communication cable from the substation to the generator, relays at the generator to allow the system to “trip off” the generator under appropriate circumstances, and work in the substation to allow the fiber optic communications to “tie in” to the 3VO sensing equipment (potentially including the installation of a Real Time Automated Controller (“RTAC”) in the substation).

increased load from the addition of the fiber optic cable or to maintain required clearances between conductors, the fiber optic cable, and the ground.

C. Current protection requirements for the two pending applications to interconnect to the Scotts-Mills-13 feeder.

There are two pending requests by small generators to interconnect to the Scotts Mills-13 feeder. The higher-queued request was submitted by Marquam Creek and was assigned to queue position SPQ0093. Marquam Creek proposes to interconnect a 2.0 MW solar generator to the feeder. PGE has concluded that aggregate generation on the feeder (with the Marquam Creek project included) will be 2.193 MW and that this is more than 100 percent of the daytime minimum load on the substation transformer (measured to be 2.105 MW).⁵ PGE has therefore required Marquam Creek to pay for the following facilities or upgrades to address backfeed protection: (i) the installation of hot line blocking (installation of 13-kV voltage transformers and replacement of the feeder breaker and relay, estimated to cost \$265,200); (ii) the installation of 3VO sensing in the substation (installation of a circuit breaker, replacement of the substation transformer relays with dual SEL-487E relay panels, and installation of 60-kV voltage transformers, estimated to cost \$558,000); and (iii) the installation of transfer trip from the substation to the Marquam Creek project (fiber optic cable, testing and termination, and pole replacement or modification, estimated to cost \$2,879,837).

⁵ In PGE's most recent system impact study of the Marquam Creek interconnection (dated January 21, 2020), PGE concluded that the amount of installed and proposed generation on the feeder (when Marquam Creek is included) is 2.261 MW, and that the daytime minimum load is 2.05 MW (occurring on May 29, 2019). By email from PGE to Marquam Creek, PGE updated these values to be aggregate generation of 2.193 MW and daytime minimum load of 2.105 MW (occurring on September 25, 2019). These new values were further discussed and verified in letters from PGE to Marquam Creek or its counsel dated October 27, 2020, and December 7, 2020. These updated values (aggregate generation of 2.193 MW and daytime minimum load of 2.105 MW) form the basis of Marquam Creek's petition for waiver. After Marquam Creek submitted its Waiver Petition, PGE prepared a Facility Study which noted that daytime time minimum loads may vary from year to year (in 2020 the daytime minimum load was calculated at 2.35 MW) and continued to utilize the daytime minimum load of 2.105 MW and aggregate generation of 2.193 MW. A copy of this Facility Study, dated March 15, 2021 (as revised on March 31, 2021), is attached as Exhibit 1.

The lower-queued application to interconnect to the Scotts Mills-13 feeder has been assigned to queue position SPQ0247. This second application seeks to interconnect a proposed 1.53 MW solar generator to the feeder. In the most recent system impact study for the SPQ0247 interconnection (dated September 14, 2020), PGE noted that the aggregate generation with the addition of the SPQ0247 project (and with the Marquam Creek project higher in the queue) would be 3.53 MW and that this would exceed the calculated daytime minimum load. PGE therefore is requiring SPQ0247 to pay for a transfer trip protective scheme (estimated cost of \$539,733).⁶ PGE has not required SPQ0247 to pay for the installation of hot line blocking or of 3VO sensing at the substation transformer because it is assumed that hot line blocking and 3VO sensing will be installed as part of the interconnection of the higher-queued Marquam Creek project.

In sum, if Marquam Creek interconnects in the first queue position with a nameplate capacity rating of 2.0 MW, it is required to pay for three elements of backfeed protection: hot line blocking, 3VO sensing, and transfer trip (including pole replacement) with total estimated protection, communication, and pole replacement costs of \$3,703,037.⁷ If SPQ0247 interconnects

⁶ This total estimated cost of transfer trip (\$539,733) includes: (i) the estimated cost of fiber optic communication cable (\$461,733); and (ii) the estimated cost to install a RTAC (\$78,000) in the substation to integrate the fiber optic cable with the 3VO sensing equipment in the substation. (See System Impact Study for SPQ0247 (Sept. 14, 2020) (“SPQ0247 Study”) at 5-6, available at <http://www.oasis.oati.com/woa/docs/PGE/PGEdocs/SPQ0247SIS.pdf>.) The estimated cost of transfer trip for SPQ0247 (\$539,733) is significantly lower than the estimated cost of transfer trip for Marquam Creek (\$2,879,837) at least in part because the transfer trip estimate for SPQ0247 does not include the cost of transmission pole replacements.

⁷ These comments focus on the estimated cost of interconnection facilities and system upgrades needed to address concerns with backfeed (e.g., hot line blocking, 3VO sensing, and transfer trip). These costs of backfeed protection are typically referred to in the interconnection studies as “Protection Requirements” and “Communication Requirements.” These comments focus on these backfeed protection requirements because those are the requirements that could be impacted by the petition for waiver. These comments do not focus on other interconnection costs such as the installation of a new primary service with bi-directional meter or the replacement of fuses or reclosers on the distribution system (these other costs are typically referred to in the interconnection studies as “Distribution Modifications”). Under the March 15, 2021, facility study for the Marquam Creek interconnection, PGE estimated the cost of Distribution Modifications (equipment outside the substation) to be \$119,493, PGE estimated the cost of Protection Requirements (equipment inside the substation, e.g., 3VO sensing) to be \$823,200, PGE estimated the cost of Communications Requirements (fiber for transfer trip) to be \$202,837; and PGE estimated the cost of Transmission Structures (pole replacement made necessary by transfer trip) to be \$2,677,000. (Ex. 1 at 7-8.) The total estimated cost of interconnection facilities and system upgrades for the Marquam Creek interconnection is \$3,822,530. (*Id.* at 8.)

in the second queue position with a nameplate capacity rating of 1.53 MW, it is required to pay for one element of backfeed protection, transfer trip (estimated cost of \$539,733).⁸

D. Assignment of protection requirements if Marquam Creek reduces its nameplate capacity rating without a waiver of OAR 860-082-0025(1)(c).

Marquam Creek has proposed reducing the nameplate capacity rating of its generation facility by approximately 100 kilowatts (“kW”) to avoid triggering the need for 3VO sensing.⁹ However, if Marquam Creek reduces its nameplate capacity rating, then Marquam Creek will be required, by operation of OAR 860-082-0025(1)(c), to file a new interconnection application and Marquam Creek will receive a new queue position behind SPQ0247 in the queue to interconnect to the Scotts-Mills-13 feeder. Under these circumstances, PGE anticipates the following impacts to the protection requirements for SPQ0247 and Marquam Creek.

First, the SPQ0247 interconnection would be studied in the first queue position at a nameplate capacity rating of 1.53 MW. If the existing generation on the feeder remains 0.193 MW and the daytime minimum load remains 2.105 MW (measured on September 25, 2019, at 1:00 PM, as shown in the October 27, 2020 letter from PGE to Marquam Creek Solar),¹⁰ then the aggregate

⁸ In the September 14, 2020, system impact study for the SPQ0247 interconnection, the estimated cost of Distribution Modification (equipment outside the substation) is \$226,225, the estimated cost of Protection Requirements (equipment inside the substation, in this case RTAC to facilitate transfer trip) is \$74,100, and the estimated cost of Communication Requirements is \$461,733 (fiber for transfer trip). The total estimated cost of backfeed protection (transfer trip) is \$535,833 (total of estimated cost of Protection Requirements and Communication Requirements). The total estimated cost of interconnection facilities and system upgrades for the SPQ0247 interconnection is \$762,058. These cost estimates will be refined in the facility study for the SPQ0247 interconnection and in any interconnection agreement with SPQ0247.

⁹ See Marquam Creek Solar’s Petition for Waiver of OAR 860-082-025(1)(c) (Jan. 25, 2021) (“Waiver Petition”) at 9 (“The proposed reduction in capacity is in the range of only 100 kW[.]”). Marquam Creek has calculated that a reduction in capacity of 88 kW would avoid triggering the need for 3VO sensing. Marquam Creek has “proposed that PGE agree to allow it to reduce its nameplate capacity by 88 kW or such other reasonable amount PGE deems necessary to avoid aggregate generation on the feeder exceeding daytime minim load.” (*Id.* at 7.) For simplicity, PGE’s comments refer to Marquam Creek’s proposal as a request to reduce the nameplate capacity of its generator by 100 kW, from 2.0 MW to 1.9 MW.

¹⁰ For discussion purposes only, these PGE comments rely on the aggregate generation value and the daytime minimum load value discussed in PGE’s December 7, 2020, letter, which is attached to the Petition at Exhibit 7. If Marquam Creek modifies its nameplate capacity, it will be necessary to re-study the Marquam Creek and the SPQ0247 interconnection requests and PGE will need to verify the current values for aggregate generation and daytime minimum load as part of those re-studies.

generation with the addition of the SPQ0247 project would be 1.723 MW, which is less than 90 percent of the daytime minimum load. As a result, PGE would not expect to require hot line blocking, 3VO sensing, or transfer trip as part of the interconnection of SPQ0247 in the first queue position.

Second, the Marquam Creek interconnection would be studied in the second queue position at a nameplate capacity rating of 1.9 MW. If the existing generation on the feeder remains 0.193 MW and the daytime minimum load remains 2.105 MW, then aggregate generation (with SPQ0247 in the first queue position and Marquam Creek in the second queue position) would be 3.623 MW, which is more than 100 percent of the daytime minimum load of 2.105. As a result, PGE would expect to require hot line blocking, 3VO sensing and transfer trip (with any necessary pole replacement) as part of the interconnection of a 1.9 MW Marquam Creek project in the second queue position (these are the same elements of backfeed protection that PGE is currently requiring with Marquam Creek interconnecting a 2.0 MW project in the first queue position).

In sum, if Marquam Creek reduces its nameplate capacity rating by approximately 100 kW and the Commission's interconnection rules are enforced without waiver, then PGE would expect: (A) the interconnection requirements for SPQ0247 will decrease because it will not be necessary for SPQ0247 to pay for transfer trip (an estimated reduction in costs for SPQ0247 of \$539,733) and no hot line blocking or 3VO sensing would be required for its interconnection; and (B) the interconnection requirements for Marquam Creek will remain the same (hot line blocking, 3VO sensing, and transfer trip with associated pole replacement).

E. Assignment of protection requirements if Marquam Creek reduces its nameplate capacity and the Commission waives OAR 860-082-0025(1)(c).

If Marquam Creek reduces its nameplate capacity rating by approximately 100 kW, and the Commission grants the requested waiver of OAR 860-082-0025(1)(c), then Marquam Creek

would interconnect in the first queue position at a nameplate capacity rating of approximately 1.9 MW. If it is assumed that the existing generation on the feeder remains 0.193 MW and the daytime minimum load remains 2.105 MW, the addition of a 1.9 MW Marquam Creek project in the first queue position would result in aggregate generation of 2.093 MW, which is greater than 90 percent but less than 100 percent of the daytime minimum load. As a result, PGE would expect to require Marquam Creek to pay for hot line blocking, but Marquam Creek would not be required to pay for 3VO sensing or transfer trip protection (and associated pole replacement). This would reduce Marquam Creek's estimated interconnection costs (from the estimated cost of interconnecting a 2.0 MW project in the first queue position) by approximately \$3,437,837.

If SPQ0247 is re-studied with the assumption that the Marquam Creek project will interconnect in the first queue position at a nameplate capacity of 1.9 MW and is required to pay for hot line blocking but not for 3VO sensing or transfer trip, then the addition of the SPQ0247 project (with a 1.53 MW nameplate capacity rating) in the second queue position will likely cause aggregate generation to exceed the daytime minimum load. As a result, SPQ0247 will likely be required to pay for 3VO sensing and transfer trip at an estimated cost of \$1,100,000 (or more if pole replacement is needed).

In sum, granting the Waiver Petition is likely to decrease Marquam Creek's interconnection costs by approximately \$3,437,837 and is likely to increase SPQ0247's interconnection costs by \$558,000 if we compare the outcome with the alternative in which Marquam proceeds without changing its nameplate capacity and without reapplying. If we compare the impact on SPQ0247 with the more likely scenario in which, absent a waiver of the rules, Marquam either simply does not proceed or reapplies and is placed in a new, lower queue position, SPQ0247 would experience

a likely increase of interconnection costs of approximately \$1,100,000 under the assumption that the waiver request is granted.

F. Granting or denying the Waiver Petition may result in one of the projects becoming uneconomic and being abandoned.

In the Waiver Petition, Marquam Creek states that its 2.0 MW project cannot bear the cost of 3VO sensing and that Marquam Creek would have to abandon development of the project if 3VO sensing is required.¹¹ Presumably, these same economic pressures apply to the project proposed by SPQ0247, which is smaller than the project proposed by Marquam Creek. As a result, granting the Waiver Petition would result in the Commission effectively choosing which project will be able to proceed and which project will need to be abandoned as uneconomic and doing so in a manner that waives and is contrary to the current rules.

G. If waiver is granted the Commission will likely face more petitions for waiver.

If the Commission grants Marquam Creek's Waiver Petition, the Commission should expect to receive an increased number of petitions for waiver of OAR 860-082-0025(1)(c). It is not uncommon for interconnection studies to show that a project could be economically improved by modifying its nameplate capacity rating, in which case the higher-queued project will have an incentive to file a petition for waiver of OAR 860-082-0025(1)(c). If the Commission invites further waiver petitions, the Commission will need to establish a governing principle and apply it on a case-by-case basis to determine whether it is appropriate to allow the high-queued project to change its nameplate capacity and remain in its original queue position.

¹¹ Waiver Petition at 2 (noting that the total estimated cost to interconnect the Marquam Creek project with 3VO sensing is \$1,100,053 and stating: "That amount is cost prohibitive for the small facility and will result in the development being abandoned.").

H. Outside of this docket and on a going forward basis, PGE is willing to explore queue reform.

The Scotts Mills-13 feeder is a good example of some of the challenges associated with the serial interconnection study process established by the Commission's small generator interconnection rules. As discussed above, the serial study process can lead to a cascading series of re-studies as higher-queued projects withdraw and this can result in shifting interconnection requirements and interconnection costs. The need for restudies, and the shifting of interconnection costs caused by re-studies, is not the fault of any of the interconnection applicants or of the utility; rather, it is consequence of the serial study process. PGE is interested in improving the process to address some of the commonly experienced challenges under the current serial study process. To that end, PGE looks forward to working with Commission Staff and with stakeholders on queue reform to be applied on a going forward basis. However, PGE does not support applying such queue reform on a retroactive basis to the treatment of Marquam Creek, SPQ0247, and the specific issues raised in Marquam Creek's Waiver Petition.

I. The other interconnection rules and the other interconnection applications noted by Marquam Creek are inapposite.

Marquam Creek's Waiver Petition asserts that other interconnection rules in the United States commonly allow the interconnection applicant to modify the capacity of its project without losing its position in the interconnection queue.¹² Marquam Creek argues that the Commission should consider these other rules as support for the idea that waiver of OAR 860-082-0025(1)(c) is consistent with widespread interconnection practices. Marquam Creek specifically points to two sets of interconnection procedures – the Federal Energy Regulatory Commission's ("FERC") Large Generator Interconnection Process ("LGIP")¹³ and the California Independent System

¹² Waiver Petition at 2, 9-14.

¹³ *Id.* at 9-10.

Operator's ("CAISO") LGIP.¹⁴ Neither of these sets of interconnection procedures are close analogs of the Commission's small generator interconnection rules.

Both sets of rules cited by Marquam Creek apply to large generators interconnecting under an Open Access Transmission Tariff. Under these processes, network upgrade costs are ultimately paid by the utility and recovered as part of transmission rates charged to all transmission customers.¹⁵ Under the Commission's small generator interconnection rules, there is no similar mechanism for the utility to pay the cost of interconnection-related system upgrade and to then recover those costs through rates charged to the class of customers who obtain interconnection service.

Because the FERC LGIP and the CAISO LGIP are implementing a fundamentally different system that assigns and recovers costs differently from the Commission's small generator interconnection rules, the FERC LGIP and CAISO LGIP are not appropriate models or analogs for how the Commission should address modification of nameplate capacity under the small generator interconnection rules.

Marquam Creek also argues that PGE has allowed a prior interconnection applicant—Goose Creek Solar LLC ("Goose Creek")—to reduce its nameplate capacity rating without requiring that it re-apply and be assigned a new, lower queue position.¹⁶ The treatment of Goose Creek is not applicable to the Marquam Creek Waiver Petition. When PGE allowed Goose Creek to modify its nameplate capacity rating without re-applying, there was no pending lower-queued request to interconnect to the same feeder. If PGE had required Goose Creek to re-apply and to

¹⁴ *Id.* at 10-11.

¹⁵ *See generally*, 104 FERC 61,103, Order 2003 (Jul. 24, 2003); 106 FERC 61,220, Order 2003A (Mar. 5, 2004) ¶¶ 7-11, 341 ("the Transmission Provider's transmission rates provide for recovery of, and return on, all costs associated with Network Upgrades.").

¹⁶ Waiver Petition at 12-13.

obtain a new queue position, it would have made no practical difference because Goose Creek would have remained in the first queue position on the feeder.

Marquam Creek also argues that PacifiCorp has allowed two interconnection applicants to change their nameplate capacity without reapplying and obtaining a new queue position.¹⁷ PGE cannot speak to the circumstances of these applications because PGE is unfamiliar with the applications. In any event, PacifiCorp’s processing of its interconnection queue does not have any bearing on PGE’s interconnection queue.

Finally, Marquam Creek argues that the Commission should grant waiver of OAR 860-082-0025(1)(c) because Marquam Creek seeks to participate in the Commission’s Community Solar Program (“CSP”), and the rules to qualify for that program allow an applicant to modify the nameplate capacity of its generator by up to 199 kW without loss of qualification.¹⁸ However, the rules governing qualification for the CSP are different from the rules governing interconnection. Under the Commission’s small generator interconnection rules, an applicant must re-apply if the applicant modifies the nameplate capacity rating of its project.¹⁹ Likewise, under Section 5(1) of PGE’s Commission-approved CSP interconnection tariff, an applicant must reapply if it changes its nameplate capacity rating.²⁰ There is no basis to conclude that the freedom to change project capacity by up to 199 kW for purposes of *qualifying* for the CSP was also intended to apply to the interconnection process. Both the Commission’s small generator interconnection rules and the CSP-specific interconnection rules, provide that “any” change in nameplate capacity rating is considered significant and requires a new application to interconnect and a new queue position.

¹⁷ *Id.* at 13.

¹⁸ Waiver Petition at 18.

¹⁹ OAR 860-082-0025(1)(c).

²⁰ *In the Matter of Commission Community Solar Program Implementation*, Docket No. UM 1930, PGE Compliance Filing Advice No. 20-04, Ex. A at 7 (Redline Standard Interconnection Procedures for CSP Projects at Section 5(1)(b)&(d)) (Apr. 17, 2020) (available at <http://edocs.puc.state.or.us/efdocs/HAD/um1930had162523.pdf>; see also Docket No. UM 1930, Order No. 20-122 at 1 (Apr. 9, 2020) (approving tariff).

III. CONCLUSION

PGE does not support or oppose Marquam Creek’s Waiver Petition. In deciding whether to grant or deny the Waiver Petition, the Commission should consider the following impacts that PGE anticipates will result from a decision to grant or deny the Waiver Petition.

First, if the Commission grants or denies the Waiver Petition, PGE estimates that it will have the following impact on the cost of protection and communication requirements for the Marquam Creek and SPQ0247 interconnections:

Scenario	Marquam Protection Cost*	SPQ247 Protection Cost*
Waiver Request Denied—Marquam constructed first at original size/SPQ0247 constructed second	\$3.7 million	\$540,000
Waiver Request Denied—Marquam constructed second at reduced size /SPQ0247 constructed first	\$3.7 million	\$0
Waiver Request Denied—Marquam withdraws / SPQ0247 constructed first	\$0	\$0
Waiver Request Granted—Marquam constructed first at reduced size/SPQ0247 constructed second	\$321,000	\$1.1 million

* Costs listed are estimated cost of the protection measures at issue in the Waiver Petition (hot line blocking, 3VO sensing, transfer trip, associated pole replacement). Both projects will incur other interconnection costs not at issued in the Waiver Petition and not identified here (e.g., distribution modifications).

Second, if the Commission grants the Waiver Petition, it should anticipate an increase in such petitions from other interconnection applicants, as higher-queued projects seek to “right-size” their projects while retaining their queue positions.

Third, Second, the cascading series of restudies that has occurred on the Scotts Mills-13 feeder is caused by the serial study process found in the Commission’s small generator interconnection rules and is not the fault of applicants or the utility. PGE looks forward to working with Staff and stakeholders to explore the possibility of interconnection queue reform with the goal of addressing some of the existing challenges with the serial study process. However, PGE

does not support applying any such queue reforms retroactively to Marquam Creek, SPQ0247, or the specific factual circumstances in the Waiver Petition.

DATED this 1st day of April 2021.

Respectfully submitted,

MARKOWITZ HERBOLD PC

s/ Jeffrey S. Lovinger

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Exhibit 1

PGE Facility Study

March 15, 2021

Portland General Electric



Facility Study

Interconnection Request:

Marquam Creek Solar – 2.00 MWAC

SPQ0093

3/15/2021

PGE Facility Study subject to change- Not for construction



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1. Introduction

On July 24, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for a 2.00 MWAC solar photovoltaic facility to be located in Clackamas County, Oregon at GPS coordinates 45.08308, -122.672222. The interconnection point will be on PGE's Scotts Mills-13 kV distribution feeder connected to the Scotts Mills substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0093 to the Interconnection Request.

On December 15, 2020, PGE received an executed Facility Study Agreement with the appropriate deposit from the Interconnection Customer.

The Facility Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualifying Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. Facility Study Scope

The primary purpose of the Facility Study is to provide a preliminary project scope, cost estimates, and estimated design and construction timeline for the necessary infrastructure modifications to serve a new 2.00 MWAC generation facility. PGE in the System Impact Study identified the following necessary modifications:

- Documentation of any impacts observed in meeting the NERC/WECC System Performance Criteria that are adverse to the reliability of the electric system as a result of the interconnection.
- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to design and construct the required additions and system upgrades necessary to accommodate the request.

The Facility Study report will identify any additional Interconnection Requirements and provide a preliminary cost estimate.



3. Facility Study Assumptions

The Facility Study considerations include the following assumptions:

- 2.00 MWAC is assumed to be the peak output. The generation is assumed to be summer peaking.
- The Point of Interconnection will be on PGE's Scotts Mills-13 kV distribution feeder.
- Delivery Voltage at the point of interconnection is assumed to be 13 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the customer's side of the Point of Interconnection.
- Line reconductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer.
- The load characteristics of the electrical equipment during starting and operation will not have a negative impact on the quality of service to PGE's customers in the Sandy area.
- The Interconnection Customer will acquire all necessary distribution line easements, including easements for PGE's owned underground cable route for the new service.
- This report is based on information available at the time of the study.

4. Facility Study Overview

The scope of work detailed below outlines the requirements and responsibilities of both PGE and the Interconnection Customer.

Distribution System Modifications

Based on the distribution engineering analysis performed, SPQ0093 will overload an existing 65T fuse #30384. To resolve this, the fuse will need be replaced with a 100T fuse.

A hydraulic 140A recloser #4168, near the substation, will need to be replaced with an electronic recloser. The recloser upgrade is required so the recloser can properly function with reverse power flow caused by the interconnection.

The regulator for Scotts Mills substation transformer does not compensate for overvoltage in the heavy load base case scenario, so the settings must be adjusted. To mitigate this issue and any overvoltage that would occur from SPQ0093 interconnection, the voltage set point should be decreased from 120.0V to 118.0V.



To properly service the generating facility, the installation of a new primary service and metering package will be needed.

The analysis determined during light and heavy load conditions the generating facility may cause voltage flicker issues on the feeder. The Interconnection Customer will be required to use dynamic reactive current support to mitigate this concern.

The cost associated with dynamic reactive current support will be borne by the Interconnection Customer and is not included in PGE's cost estimate.

Protection Requirements

The Daytime Minimum Load (DML) can vary from year to year. For example, the DML for the Scotts Mills-13 kV feeder and Scotts Mills substation transformer from the past year was 2.35 MW which occurred on 6/18/2020 at 1PM (note the substation transformer only serves the one feeder, so the feeder DML is the same as the transformer DML). However, the DML for the Scotts Mills-13 kV feeder and substation transformer from the prior year was 2.105 MW which occurred on 9/25/2019 at 1PM. The amount of installed and proposed generation on the feeder and substation transformer when SPQ0093 is included is 2.193 MW. The Scotts Mills substation transformer is rated at 9.4.

Under the conditions outlined above the generation has the potential to carry the entire Scotts Mills substation transformer load which would cause backflow into the transmission system.

Due to the amount of generation on the Scotts Mills substation the following substation modification are necessary:

- Install a set of 13-kV voltage transformers
- Replace the feeder breaker and relay
- Install a 115-kV circuit breaker
- Install a set of 57-kV voltage transformers
- Replace the substation transformer relays with dual SEL-487E relay panels
- Transfer trip to the DER via SEL Mirror Bits

Transfer trip requires running a fiber optic cable from the Scotts Mills Substation to the point of interconnection which is approximately 2.7 miles. Additionally, PGE has identified 55 transmission structures which will need to be replaced in order to accommodate the installation of the fiber optic cable. The transmission structures will need to be replaced due to additional loading from the fiber optic cable.



PGE's Responsibilities

PGE will design, procure, install and maintain the new service conductor and metering equipment. This includes the CT's and PT's. However, the conduit and trench from the Point of Interconnection to the riser pole will be installed by the Interconnection Customer.

On the distribution system PGE will replace the 65T fuse set with 100T fuse set. PGE will also replace the 140A hydraulic recloser with an electronic recloser. PGE will modify the regulator settings as well.

At the point of interconnection PGE will install a set of 300-amp solid-blade cutouts.

Within the Scotts Mills substation PGE will design, procure and construct the installation of the following:

- Install a set of 13-kV voltage transformers
- Replace the feeder breaker and relay
- Install a 115-kV circuit breaker
- Install a set of 57-kV voltage transformers
- Replace the substation transformer relays with dual SEL-487E relay panels
- Transfer trip to the DER via SEL Mirror Bits

A fiber optic cable will be engineered, installed and maintained by PGE from the Scotts Mills substation to the point of interconnection along the existing distribution route. To accommodate the installation of the fiber optic cable, modifications or replacement of 55 transmission structures will be necessary. PGE's approved method for transfer trip is Schweitzer Engineering Laboratory's (SEL) Mirror Bits Protocol.

A mobile substation will be required in order to offload the substation transformer to allow for the substation modifications to take place.

Interconnection Customers Responsibilities

In order to interconnect the proposed facility to PGE's distribution system, the Interconnection Customer will need to trench and install a 4" conduit from the Point of Interconnection to the riser pole in accordance with PGE's standards. Additionally, a pull rope will need to be placed in the conduit to allow PGE to pull in the new service conductors.

The Interconnection Customer will need to purchase and install a PGE-577 switch vault along the same path as the conduit. The vault needs to be located between the outside fence of the generation facility and the riser pole. The vault will contain laterals, provided



by PGE, that can be used as an isolation point for PGE crews. Vault specifications will be provided during the engineering of the new primary service. Additional PGE-577 vaults may be necessary based on the final location of the Interconnection Customers switchgear.

The Interconnection Customer will also be responsible for the installation of the CT's and PT's. The CT's and PT's will be provided by PGE and wired by PGE after they have been installed.

The Interconnection Customer will need to provide and install a PGE-444 vault near the riser pole for the fiber optic cable. Additional PGE-444 vaults are required every 500' from the riser pole to the customers NEMA enclosure. A second 4" conduit will need to be installed from the riser pole between each PGE-444 vault to the NEMA enclosure. The conduit and vaults will house the fiber optic cable and innerduct.

The Interconnection Customer will need to install two NEMA enclosures. One NEMA enclosure must include a 1' din-rail installed that allows the installation of a fiber patch panel. The fiber patch panel will be provided and installed by PGE. The second will hold the SPQ0093 relay. Raceway will need to be installed between the two enclosures so a jumper can be connected between the fiber patch panel and the SPQ0093 relay.

SPQ0093 will need to install an SEL-351 or SEL-751 relay capable of handling SEL Mirror Bits Protocol. SPQ0093 needs to provide PGE with the communication port on the relay they plan to use. The Interconnection Customer will need to program the settings for the SPQ0093 relay. Prior to implementing the settings, they must be reviewed and approved by PGE. SPQ0093 will need to provide the proposed settings for review 6 weeks before the in-service date.

The Interconnection Customer will be required to use dynamic reactive current support to mitigate voltage flicker on the feeder. The cost associated with dynamic reactive current support will be borne by the Interconnection Customer and is not included in PGE's cost Estimate.

5. Cost Estimate

The following estimate represents only the scopes of work that will be performed by the Distribution Provider. Costs for any work being performed by the Interconnection Customer are not included.

Distribution Modifications	\$119,493.00
(100T Fuse, Electronic Recloser and Primary Service)	
Protection Requirements	\$823,200.00
(13-kV Breaker/Fuse/VTs, 115-kV Circuit Breaker, 57-kV VT's, SEL487E Relay Panels, Transfer Trip Termination)	



Communications Requirements (Fiber Optic Cable, Termination and Testing)	\$202,837.00
Transmission Structures (Transmission Pole Replacements)	\$2,677,000.00
Total	\$3,822,530.00

A payment schedule will be set forth and agreed to in the Interconnection Agreement.

6. Schedule

PGE estimates it will require approximately 24 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement.

The Interconnection of SPQ0093 is not dependent on any higher queued projects completing their interconnection requirements.

Proposed Schedule

Executed Interconnection Agreement	5/3/2021
Engineering Design Starts	7/2/2021
Engineering Design Complete	3/7/2022
PGE Construction Scheduled	4/4/2022
Interconnection Customer Switchgear Installed/Inspected	3/3/2023
Interconnection Facilities Complete	4/3/2023
In-Service Date	5/5/2023

PGE cannot guarantee completion of any project on a targeted date as the schedule is dependent on several variables, including but not limited to, construction of other potential interconnection projects, payment milestones being met by the Interconnection customer, system emergencies, inclement weather conditions, or any other significant impacting event.

7. Higher Queued Projects

All active higher queued generation Interconnection Requests were considered in this study and are identified below. If any of these requests are withdrawn, the PGE reserves the right to restudy the request, as the results and conclusions contained within the study could significantly change.



Currently there are no higher queued Interconnection Requests on Scotts Mills-13 kV feeder.