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**Donald J. Light**  
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November 1, 2018

***Via Electronic Filing and U.S. Mail***

Public Utility Commission of Oregon  
Filing Center  
201 High Street SE, Suite 100  
P.O. Box 1088  
Salem, OR 97308-1088

Re: UM 1971 – Waconda Solar, LLC v. Portland General Electric Company

Attention Filing Center:

Enclosed for filing is Portland General Electric Company's Answer to the Complaint, together with Exhibits A-K, in the above-named docket. A paper copy of this filing will follow by U.S. Mail because the filing is over 100 pages.

Thank you for your assistance.

Sincerely,

Donald J. Light  
Assistant General Counsel

DJL:hp  
Enclosure

c: Marie P. Barlow  
Jeffrey S. Lovinger  
Waconda Solar, LLC

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**UM 1971**

WACONDA SOLAR, LLC,

Complainant,

vs.

PORTLAND GENERAL ELECTRIC  
COMPANY,

Defendant.

**PORTLAND GENERAL ELECTRIC  
COMPANY’S ANSWER TO THE  
COMPLAINT**

**I. INTRODUCTION**

Pursuant to ORS 756.512 and OAR 860-001-0400, defendant Portland General Electric Company (“PGE”) submits the following answer (“Answer”) to the complaint (“Complaint”) filed by Waconda Solar, LLC (“Waconda Solar” or “Complainant”) on September 28, 2018.

Complainant has applied to interconnect a proposed 2.35 megawatt (“MW”) solar generation facility (the “Project”) to PGE’s electrical system on the Waconda-13 distribution feeder (the “Feeder”) in Marion County, near Salem, Oregon. Complainant and PGE have entered into a Feasibility Study Agreement and a System Impact Study Agreement. PGE issued a Feasibility Study on July 10, 2018, a Revised Feasibility Study on August 16, 2018, and a System Impact Study on October 25, 2018.

The System Impact Study requires the following interconnection facilities or system upgrades: (1) a service and metering package; (2) the re-conductoring of approximately 2.3 miles of overhead conductor; (3) the replacement of an existing hydraulic recloser with a new electronic recloser; (4) the replacement of a 65T fuse with a 100T fuse; (5) installation of a transfer trip protection scheme (including a fiber optic communication channel); and (6) the

installation of a Real-Time Automation Controller (RTAC) in the substation to facilitate the transfer trip communications. The System Impact Study also concluded that the Project could cause voltage flicker on the Feeder and requires that the Complainant implement dynamic reactive current support to mitigate this concern.<sup>1</sup>

The service and metering package will include a new primary service conductor and a bi-directional meter. The purpose of the service and metering package is to allow PGE to provide metered electric utility service to the Project and to allow Complainant to deliver metered Project net output to PGE. The line re-conductor will involve two different sections of the Feeder and include a railroad crossing.<sup>2</sup> The purpose of the re-conductor is to increase the load carrying capacity of the lines as the aggregate generation exceeds the thermal limits of the existing conductor.<sup>3</sup> The new recloser and new fuse will replace two existing protective devices (a hydraulic recloser and a 65T fuse) that will become overloaded by the interconnection of the Project.<sup>4</sup> The transfer trip protection scheme is a direct transfer trip scheme with a fiber optic communication channel.<sup>5</sup> The purpose of the transfer trip protection scheme is to ensure that the Project ceases to energize any unintended electrical island on the Feeder within two seconds of the island forming, consistent with IEEE 1547, Section 4.4.1. The transfer trip protection scheme also ensures that the Project will not backfeed a ground short or other contingency on the high-side of the Substation 57 kV transformer. The RTAC is required to expand communications

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<sup>1</sup> System Impact Study at 5-7. A copy of the System Impact Study is attached to this Answer as Exhibit K.

<sup>2</sup> *Id.* at 5.

<sup>3</sup> *Id.*

<sup>4</sup> *Id.*

<sup>5</sup> *Id.* at 6-7.

capacity at the substation sufficiently to accommodate the transfer trip scheme.<sup>6</sup> The estimated cost of these interconnection facilities or system upgrades is \$1,002,700.00.<sup>7</sup>

Complainant has stated that it wishes to hire a third-party consultant to complete the remaining interconnection studies. PGE has indicated that it does not agree to the use of a third-party hired by the Complainant to complete the utility's interconnection studies. PGE has hired its own third-party consultants to assist with elements of the interconnection study process. PGE provided Complainant with the System Impact Study within the timeframe established by the System Impact Study Agreement. As of the filing of this Answer, the only remaining interconnection study is the Facilities Study.

Complainant has stated that it intends to hire its own third-party consultant to perform an independent system impact study. If Complainant provides PGE with an independent system impact study, PGE will evaluate and address any alternative findings from that study as required by OAR 860-082-0060(7)(h).

Complainant and PGE entered into a Standard Renewable In-System Variable Power Purchase Agreement (the "PPA") effective June 4, 2018. Under the PPA, Complainant has selected a scheduled commercial operation date ("COD") of February 1, 2020, and a termination date ("Termination Date") of April 1, 2038.<sup>8</sup>

Complainant has four primary complaints. First, Complainant alleges that PGE has not provided complete or accurate information in its Feasibility Study.<sup>9</sup> Second, Complainant alleges that PGE has not provided complete and accurate information regarding its existing system

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<sup>6</sup> *Id.* at 7.

<sup>7</sup> System Impact Study at 7.

<sup>8</sup> A copy of the PPA has been filed in Docket No. RE 153 and is available at: <https://edocs.puc.state.or.us/efdocs/HAQ/re143haq164533.pdf>.

<sup>9</sup> Complaint at ¶ 97.

configuration or provided reasonable access or cooperation so that Complainant can obtain an independent system impact study.<sup>10</sup> Third, Complainant alleges that PGE has violated its obligation to agree to allow Complainant to hire a third-party consultant to complete the interconnection studies.<sup>11</sup> Fourth, Complainant alleges that PGE has unduly discriminated against Complainant or in favor of PGE or other interconnection customers by allegedly agreeing to third-party consultants in other instances but not in Complainant's case.<sup>12</sup>

The Complaint asks the Commission to grant numerous forms of relief, including: (1) requiring PGE to provide Complainant with a complete and accurate Feasibility Study; (2) requiring PGE to allow Complainant to hire a third-party consultant to complete its interconnection studies; (3) requiring PGE to provide information and access so that an independent system impact study can be performed; (4) requiring PGE not to make or give undue preference or advantage to any other QF or itself, and requiring PGE not to subject Complainant to undue or unreasonable prejudice or disadvantage; and (5) requiring PGE to grant an extension of Complainant's PPA commercial operation date and PPA termination date to account for the delayed in-service date PGE has allegedly caused.<sup>13</sup>

By this Answer, PGE denies that Complainant is entitled to the relief requested in the Complaint. The reasons the Commission should deny the requested relief include, without limitation, the following:

**First,** PGE has complied with the interconnection process established by OAR 860-082-0005 through OAR 860-082-0085.

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<sup>10</sup> *Id.* at ¶¶ 87, 106, and page 2.

<sup>11</sup> Complaint at ¶ 123.

<sup>12</sup> *Id.* at ¶ 140.

<sup>13</sup> *Id.* at 22-23 (Prayer for relief ¶¶ 6 through 10, identifying the principle relief sought by Complainant).

***Second***, the Feasibility Study, Revised Feasibility Study, and System Impact Study identify expected impacts on PGE's system and required interconnection facilities and system upgrades in sufficient detail to satisfy the requirements of the Commission's rules and orders, including the estimated cost and schedule associated with the interconnection facilities and system upgrades.

***Third***, even if the Feasibility Study and Revised Feasibility Study contained errors or inconsistencies, those studies are preliminary studies, which are frequently skipped altogether by the utility and the interconnection customer, and PGE has already provided Complainant a System Impact Study that corrects any error or inconsistencies contained in the Feasibility Studies. Any such errors or inconsistencies were harmless errors and did not meaningfully impact the analysis under the Feasibility Study or the System Impact Study.

***Fourth***, to the extent that PGE missed any deadlines or scheduled milestones with regard to the production of Feasibility Study results, such delay was not unreasonable, the result of bad faith, or intended to frustrate Complainant's interconnection request. In addition, PGE has completed its System Impact Study and proposed an engineering and construction schedule that allows Complainant to be interconnected in time to meet the February 1, 2020 scheduled COD contained in Complainant's PPA. In sum, any delays associated with Complainant's interconnection request were not the result of bad faith or unreasonable actions on PGE's part and did not result in Complainant's inability to complete its interconnection in advance of its scheduled COD.

***Fifth,*** PGE is not required to agree to allow Complainant to hire consultants to conduct the required interconnection studies.<sup>14</sup> PGE is willing to hire its own consultants if necessary to complete the required studies and PGE has hired a third-party consultant to assist in the analysis required for the System Impact Study.<sup>15</sup> PGE is concerned that allowing an interconnection customer to hire the third-party consultant who will conduct the utility's interconnection studies could result in potential conflicts of interest, will ultimately be less efficient than PGE hiring the consultant itself, and will result in an unacceptable loss of control by PGE over the safety and reliability of its system. PGE is within its rights under the Commission's rules when it offers to hire its own consultants if necessary and refuses to agree to Complainant hiring a consultant to conduct PGE's interconnection studies, and PGE has not engaged in discrimination by choosing to proceed in this manner.

***Sixth,*** PGE has not subjected Complainant to undue or unreasonable prejudice or disadvantage and has not treated other people or itself with undue or unreasonable preference or advantage. Complainant has not alleged any facts to support such a contention and the mere fact that PGE is not willing to agree to allow Complainant to hire a third-party consultant to conduct the remaining interconnection studies does not demonstrate prejudice or preference because PGE has the discretion to agree or not agree to the use of a third-party consultant.

***Seventh,*** there are no grounds upon which to grant Complainant's request for an extension of the scheduled COD under the PPA or the termination date of the PPA. PGE has proposed an interconnection schedule that provides for the completion of engineering and

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<sup>14</sup> OAR 860-082-0060(9) is permissible, not mandatory. It provides that a public utility may contract with a third-party consultant to complete interconnection studies, and that a public utility and an applicant "may agree in writing to allow the applicant to hire a third-party consultant to complete a feasibility study, system impact study, or facilities study, subject to public utility oversight and approval." There is no mandatory requirement that a utility agree to allow an applicant to hire a third-party consultant.

<sup>15</sup> See System Impact Study at Attachment A, which is a Detailed System Impact Study Report prepared for PGE by its third-party consultant POWER Engineers, Inc. (the System Impact Study is attached to the Answer as Exhibit K).

construction of the required interconnection facilities and system upgrades prior to the current scheduled COD selected by Complainant under its PPA; as a result, there is no basis for entertaining a request to modify the scheduled COD or the PPA termination date selected by Complainant.

## **II. SERVICE**

Copies of all pleadings, motions, and correspondence should be served on PGE's counsel and representatives at the addresses below:

Donald Light  
Assistant General Counsel  
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121 SW Salmon Street, 1WTC1301  
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## **III. ANSWER**

PGE denies each and every allegation contained in the Complaint except as hereinafter expressly admitted.

Unless otherwise specified, the capitalized term "Paragraph" refers to the numbered paragraphs of the Complaint beginning on page five of the Complaint.

The first four pages of the Complaint contain a narrative introduction and legal argument. PGE does not understand the introduction to contain allegations requiring a response. PGE expects to respond to Complainant's narrative and legal arguments as part of dispositive motion practice or, if needed, at a hearing and subsequent briefing in this proceeding. In the event the Commission deems the introduction to contain allegations requiring a response, PGE denies the allegations.

In answer to some of the allegations contained in numbered Paragraphs, PGE has indicated that no response is required because the allegations are legal conclusions or legal



arguments. If the Commission deems that responses are required in such instances, then PGE denies the allegations in question.

Some of the numbered Paragraphs in the Complaint allege the exchange of written communications between the parties. In answer to some of those numbered Paragraphs, PGE has admitted the existence of the written communications, filed a copy of the written communications as exhibits (or indicated that Complainant has filed a copy with its Complaint), and indicated that the communications speak for themselves. In those instances, PGE denies all of the allegations in the associated numbered Paragraphs except to the extent that PGE expressly admits an allegation. The exhibits submitted by PGE are true and correct copies of the information exchanged by the parties.<sup>16</sup> The fact that PGE has provided a copy of a communication from Complainant to PGE does not mean that PGE admits the accuracy or truth of any assertion or allegation made by the Complainant in any communications that are attached as Exhibits to this Answer (or that are attached to the Complaint); PGE therefore denies all assertions or allegations made by Complainant in any of the Exhibits attached to this Answer (or attached to the Complaint) unless PGE has expressly admitted such an assertion or allegation in this Answer.

Some of the numbered Paragraphs in the Complaint characterize the contents of state or federal statutes or regulations, or the contents of decisions made by the Commission, the Federal Energy Regulatory Commission (“FERC”), the state courts, or the federal courts. In answer to some of those numbered Paragraphs, PGE has indicated that the statutes, regulations, or

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<sup>16</sup> Some of the communications between the parties are email exchanges in which each subsequent email includes a copy of the parties’ prior emails (i.e., an “email stream”). If PGE were to include the entire email stream for each communication between the parties, it would significantly increase the size of the attached exhibits without providing any new information. In the interest of space, PGE has not included redundant copies of the entire email stream for each communication attached as an exhibit. Instead, PGE has provided enough of the email stream to indicate that the communication in question is part of an email stream and relied on the fact that PGE has provided the remainder of the email stream in prior exhibits to allow the reader to reconstruct the entire email stream.

decisions speak for themselves. In such instances, PGE denies all of the allegations in the associated numbered Paragraph except to the extent PGE expressly admits an allegation.

In response to the numbered Paragraphs of the Complaint, PGE admits, denies, or otherwise responds as follows:

#### **IDENTITY OF THE PARTIES**

1. PGE admits the allegations in Paragraph 1.
2. PGE lacks information or knowledge sufficient to form a belief as to the truth of the allegations in Paragraph 2 and therefore denies them.

#### **APPLICABLE STATUTES AND RULES**

3. The allegations in Paragraph 3 constitute legal conclusions or legal argument to which no response is required.
4. The allegations in Paragraph 4 constitute legal conclusions or legal argument to which no response is required.

#### **JURISDICTION**

5. The allegations in Paragraph 5 constitute legal conclusions or legal arguments to which no response is required. The allegations in Paragraph 5 also characterize federal statutes and regulations and a decision of the United States Supreme Court, which speak for themselves.
6. The allegations in Paragraph 6 constitute legal conclusions or legal arguments to which no response is required. The allegations in Paragraph 6 also characterize a federal regulation, which speaks for itself.
7. The allegations in Paragraph 7 constitute legal conclusions or legal arguments to which no response is required. The allegations in Paragraph 7 also characterize Oregon statutes and regulations and a decision of the Oregon Supreme Court, which speak for themselves.

## **FACTUAL BACKGROUND**

8. PGE lacks information or knowledge sufficient to form a belief as to the truth of the allegations in Paragraph 8 and therefore denies them. PGE admits that Complainant has informed PGE that the Project will be a 2.25 MW nameplate solar qualifying facility located in Marion County, Oregon.

9. PGE admits that Complainant submitted an Interconnection Application to PGE on March 20, 2018. PGE denies the Interconnection Application was complete before PGE received the application fee on March 23, 2018. PGE denies any other allegations in Paragraph 9.

10. PGE admits the allegations in Paragraph 10.

11. PGE denies the allegations in Paragraph 11. PGE informed Complainant in writing on March 27, 2018, that Complainant's interconnection application appeared to be complete.

12. PGE admits the allegations in Paragraph 12.

13. PGE denies the allegations in Paragraph 13.

14. PGE admits the allegations in Paragraph 14.

15. PGE admits that on April 17, 2018, Complainant emailed the executed Feasibility Study Agreement to PGE. PGE lacks information or knowledge sufficient to form a belief as to the truth of the remaining allegations in Paragraph 15 and therefore denies them.

16. The allegations in Paragraph 16 characterize the Feasibility Study Agreement executed by Complainant on April 17, 2018, and executed by PGE on April 26, 2018 (the "Feasibility Study Agreement"). A copy of the Feasibility Study Agreement is attached to this Answer as Exhibit A. The Feasibility Study Agreement speaks for itself.

17. The allegations in Paragraph 17 characterize the Feasibility Study Agreement, which is attached as Exhibit A and which speaks for itself.

18. PGE admits the allegations in Paragraph 18.

19. PGE admits the allegations in Paragraph 19.

20. PGE admits the allegations in Paragraph 20.

21. PGE admits that it erred when it stated that a completed interconnection application was received April 23, 2018; the completed application was received March 23, 2018. PGE denies that this error harmed Complainant or benefited PGE in any way; the error has been corrected in the System Impact Study.

22. Paragraph 22 characterizes the content of the Feasibility Study that is attached to the Complaint as Attachment A. The Feasibility Study speaks for itself. PGE admits that it has assigned Complainant's interconnection request queue number SPQ0172. PGE admits that the Feasibility Study contains a typographical error and that the reference to Oregon Administrative Rule 860-082-0085(29) was intended as a reference to Oregon Administrative Rule 860-082-0015(29). PGE denies this error harmed Complainant or benefited PGE in any way; the error has been corrected in the System Impact Study.

23. Paragraph 23 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

24. Paragraph 24 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

25. Paragraph 25 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself. PGE admits that the Feasibility Study contains an error and that the proposed and existing generation on the distribution line should

have been reported as 15.47 MW. PGE denies that this error had any material impact on the conclusions of the Feasibility study; the error has been corrected in the System Impact Study.

26. Paragraph 26 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself. PGE admits that the Feasibility Study erroneously stated that the substation transformer was rated at 14 MW; the Feasibility Study should have stated that the substation transformer is rated at 25 MW. PGE denies that the error had any material impact on the conclusions of the study; PGE corrected this error in a Revised Facilities Study provided to Complainant on August 16, 2018.

27. Paragraph 27 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

28. Paragraph 28 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

29. Paragraph 29 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

30. PGE denies the allegations in Paragraph 30. PGE has informed Complainant's representative Troy Snyder that "distribution modification" refers to the required service and metering package and the required line modifications, and has informed Mr. Snyder that "protection requirements" refer to the required transfer trip scheme with fiber optic communications. In addition, this meaning is apparent from the context in which the terms are used in the Feasibility Study results. Finally, the meaning of these terms has been made express in the System Impact Study, which details which interconnection facilities or system upgrades are included in each cost area.

31. Paragraph 31 characterizes the content of the Feasibility Study, which is attached to the Complaint as Attachment A and speaks for itself.

32. The allegations in Paragraph 32 characterize an email sent by PGE to Complainant on July 10, 2018 (the “July 10 Email”) and the attached System Impact Study Agreement. A copy of the July 10 Email is attached to this answer as Exhibit B. The July 10 Email speaks for itself. A copy of the fully executed System Impact Study Agreement is attached to this Answer as Exhibit C.

33. The allegations in Paragraph 33 characterize the contents of a July 12, 2018 email from Complainant to PGE (the “July 12 Email”). A copy of the July 12 Email is attached to this Answer as Exhibit D. The July 12 Email speaks for itself.

34. PGE denies the allegations in Paragraph 34.

35. PGE denies the allegations in Paragraph 35 that it delayed in responding to questions from TLS Capital on other projects. PGE admits that it required approximately 57 days to process and respond to certain questions raised by TLS Capital regarding the Mt. Hope Solar project.

36. PGE admits the allegations in paragraph 36.

37. The allegations in Paragraph 37 characterize the contents of a July 27, 2018, 3:45PM email from Complainant to PGE (the “July 27 Complainant Email”). A copy of the July 27 Complainant Email is attached to this Answer as Exhibit E. The July 27 Complainant Email speaks for itself.

38. The allegations in Paragraph 38 characterize the contents of the July 27 Complainant Email, which is attached as Exhibit E and speaks for itself.

39. PGE admits the allegations in Paragraph 39.

40. PGE admits the allegations in Paragraph 40.

41. The allegations in Paragraph 41 characterize the contents of a July 27, 2018 email from PGE to Complainant (the “July 27 PGE Email”). A copy of the July 27 PGE Email is attached to this Answer as Exhibit F. The July 27 PGE Email speaks for itself.

42. The allegations in Paragraph 42 characterize the contents of the July 27 PGE Email, which is attached as Exhibit F and speaks for itself.

43. The allegations in Paragraph 43 characterize the contents of the July 27 PGE Email, which is attached as Exhibit F and speaks for itself.

44. The allegations in Paragraph 44 characterize the contents of the July 27 PGE Email, which is attached as Exhibit F and speaks for itself.

45. The allegations in Paragraph 45 characterize the contents of a July 27, 2018, 9:43PM email from Complainant to PGE (the “July 27 9:43PM Email”). A copy of the July 27 9:43PM Email is attached to this Answer as Exhibit G. The July 27 9:43PM Email speaks for itself.

46. The allegations in Paragraph 46 characterize the contents of the July 27 9:43PM Email, which is attached as Exhibit G and speaks for itself.

47. The allegations in Paragraph 47 characterize the contents of the July 27 9:43PM Email, which is attached as Exhibit G and speaks for itself.

48. PGE admits the allegations in paragraph 48.

49. PGE admits the allegations in Paragraph 49.

50. PGE admits the allegations in Paragraph 50. PGE denies that the errors in the Revised Feasibility Study had any material impact on the results of the study; the errors have been corrected in the System Impact Study.

51. PGE admits the allegations in Paragraph 51.

52. PGE admits the allegations in Paragraph 52.

53. PGE admits the allegations in Paragraph 53.

54. PGE admits the allegations in Paragraph 54. PGE denies that the inconsistent statement referred to in Paragraph 54 had any material impact on the results of the study; the inconsistency has been corrected in the System Impact Study.

55. The allegations in Paragraph 55 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself.

56. The allegations in Paragraph 56 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself.

57. The allegations in Paragraph 57 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself.

58. The allegations in Paragraph 58 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself.

59. PGE denies the allegations in Paragraph 59. PGE has informed Complainant's representative Troy Snyder that "distribution modification" refers to the required service and metering package and line modifications and has informed Mr. Snyder that "protection requirements" refers to the required transfer trip scheme with fiber optic communications. In addition, this meaning is apparent from the context in which the terms are used in the Revised Feasibility Study.

60. The allegations in Paragraph 60 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself. PGE denies that the Revised Feasibility Study does not provide any detail regarding estimated costs.



61. The allegations in Paragraph 61 characterize the contents of the Revised Feasibility Study, which is attached to the Complaint as Attachment B and speaks for itself.

62. The allegations in Paragraph 62 characterize the contents of an August 17, 2018 email from Complainant to PGE (the “August 17 Email”). A copy of the August 17 Email is attached to this Answer as Exhibit H. The August 17 Email speaks for itself.

63. PGE admits the allegation in Paragraph 63.

64. The allegations in Paragraph 64 are argumentative, conclusory, vague and imprecise and do not provide PGE with any specific facts or allegations to which PGE may respond; as a result, PGE denies the allegations in Paragraph 64.

65. The allegations in Paragraph 65 are vague, ambiguous and conclusory in that they allege unspecified errors and inconsistencies in an unspecified number of studies associated with an unspecified number of unidentified projects; because PGE cannot identify the alleged errors, inconsistencies, studies, or projects referred to by the allegations in Paragraph 65, PGE denies all of the allegations in Paragraph 65.

66. The allegations contained in Paragraph 66 are vague, ambiguous and conclusory and do not allege specific facts to which PGE can respond; PGE therefore denies the allegations in Paragraph 66.

67. PGE admits that the cost of a required system upgrade (transfer trip) was inadvertently omitted from the System Impact Study for the Eola Solar project and that this error was corrected in the Facilities Study; PGE admits that this was effectively a clerical error.

68. PGE denies that the allegations in Paragraph 68.

69. PGE admits that it initially required two sets of voltage regulators based on the results of its system impact model but that PGE agreed to reconsider that requirement based on

questions raised by the interconnection customer and ultimately decided that one set of voltage regulators would be sufficient; PGE denies that it was in error to reach its initial conclusions and notes that decisions regarding the appropriate level of protection can be complex and require discussion and additional information to resolve.

70. PGE admits that the System Impact Study required replacement of a recloser and that this requirement was eliminated as part of the Facilities Study. PGE denies any other allegations in Paragraph 70.

71. PGE denies the allegations in Paragraph 71.

72. PGE admits that there have been errors or inconsistencies in interconnection studies for projects where TLS Capital was the developer, and PGE has admitted and corrected these errors as necessary. PGE denies any other allegations in Paragraph 72.

73. The allegations in Paragraph 73 are vague, ambiguous and conclusory and do not allege specific facts to which PGE can respond; PGE therefore denies the allegations in Paragraph 73.

74. The allegations in Paragraph 74 are vague, ambiguous and conclusory and do not allege specific facts to which PGE can respond; PGE therefore denies the allegations in Paragraph 74.

75. The allegations in Paragraph 75 are vague, ambiguous and conclusory and do not allege specific facts to which PGE can respond; PGE therefore denies the allegations in Paragraph 75.

76. The allegations in Paragraph 76 are vague, ambiguous and conclusory and do not allege specific facts to which PGE can respond; PGE therefore denies the allegations in Paragraph 76.

77. PGE denies the allegations in Paragraph 77.

78. PGE denies the allegations in Paragraph 78.

79. PGE lacks information or knowledge sufficient to form a belief as to the truth of the allegations in Paragraph 79 and therefore denies them.

80. PGE lacks information or knowledge sufficient to form a belief as to the truth of the allegations in Paragraph 80 and therefore denies them.

81. PGE lacks information or knowledge sufficient to form a belief as to the truth of the allegations in Paragraph 81 and therefore denies them.

82. PGE admits the allegations in Paragraph 82; PGE has hired third-party consultants to assist with interconnection studies and with the construction of system upgrades as allowed by the Commission's rules.

83. The allegations in Paragraph 83 characterize the contents of an August 24, 2018 letter from Complainant's counsel to PGE's counsel (the "August 24 Letter"). A copy of the August 24 Letter is attached to this Answer as Exhibit I. The August 24 Letter speaks for itself.

84. The allegations in Paragraph 84 characterize the contents of the August 24 Letter, which is attached as Exhibit I and speaks for itself.

85. The allegations in Paragraph 85 characterize the contents of a September 7, 2018 letter from PGE's counsel to Complainant's counsel (the "September 7 Letter"). A copy of the September 7 Letter is attached to this Answer as Exhibit J. The September 7 Letter speaks for itself.

86. The allegations in Paragraph 86 characterize the contents of the September 7 Letter, which is attached as Exhibit J and speaks for itself.

87. The allegations in Paragraph 87 characterize the contents of the September 7 Letter, which is attached as Exhibit J and speaks for itself.

## **LEGAL CLAIMS**

### **COMPLAINANT'S FIRST CLAIM FOR RELIEF**

**WACONDA SOLAR IS ENTITLED TO RELIEF BECAUSE PGE FAILED TO PROVIDE COMPLETE AND ACCURATE INFORMATION IN BOTH ITS FEASIBILITY STUDY AND REVISED FEASIBILITY STUDY.**

88. In answer to the allegations in Paragraph 88, PGE repeats and realleges the responses made to Paragraphs 1 through 87.

89. The allegations in Paragraph 89 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 89 also characterize federal regulations and Oregon statutes and regulations, which speak for themselves.

90. The allegations in Paragraph 90 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 90 also characterize federal regulations and Oregon regulations, which speak for themselves.

91. The allegations in Paragraph 91 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 91 also characterize Oregon regulations, which speak for themselves.

92. The allegations in Paragraph 92 constitute legal conclusions or legal argument to which no response is required.

93. The allegations in Paragraph 93 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 93 also characterize Oregon regulations, which speak for themselves.

94. The allegations in Paragraph 94 constitute legal conclusions or legal argument to which no response is required. PGE denies that it violated the Commission's rules.

95. The allegations in Paragraph 95 constitute legal conclusions or legal argument to which no response is required. PGE denies that it violated the Commission's rules.

96. The allegations in Paragraph 96 constitute legal conclusions or legal argument to which no response is required. PGE denies that it violated the Commission's rules.

97. The allegations in Paragraph 97 constitute legal conclusions or legal argument to which no response is required. PGE denies that it violated the Commission's rules. PGE denies that Waconda Solar is entitled to relief.

#### **COMPLAINANT'S SECOND CLAIM FOR RELIEF**

**WACONDA SOLAR IS ENTITLED TO RELIEF BECAUSE PGE UNREASONABLY WITHHELD ITS CONSENT TO ALLOW WACONDA SOLAR TO HIRE A THIRD-PARTY CONSULTANT TO COMPLETE THE REMAINDER OF ITS INTERCONNECTION STUDIES OR TO COMPLETE AN INDEPENDENT SYSTEM IMPACT STUDY.**

98. In answer to the allegations in Paragraph 98, PGE repeats and realleges the responses made to Paragraphs 1 through 97.

99. The allegations in Paragraph 99 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 99 also characterize Oregon regulations, which speak for themselves.

100. The allegations in Paragraph 100 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 100 also characterize Oregon regulations, which speak for themselves.

101. The allegations in Paragraph 101 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 101 also characterize Oregon regulations, which speak for themselves.

102. The allegations in Paragraph 102 constitute legal conclusions or legal argument to which no response is required. PGE denies that it has an obligation to agree to allow an interconnection applicant to hire a third-party consultant to conduct interconnection studies.

103. The allegations in Paragraph 103 constitute legal conclusions or legal argument to which no response is required. PGE denies that it has an obligation to agree to allow an interconnection applicant to hire a third-party consultant to conduct interconnection studies.

104. The allegations in Paragraph 104 constitute legal conclusions or legal argument to which no response is required. PGE denies that it has an obligation to provide a list of approved third-party consultants.

105. The allegations in Paragraph 105 constitute legal conclusions or legal argument to which no response is required. PGE denies it has an obligation to inform Complainant of a process by which Complainant can propose and PGE will review third-party consultants selected by Complaint for the purpose of conducting interconnection studies; PGE denies it has an obligation to agree to allow an interconnection applicant to hire a third-party consultant to conduct the required interconnection studies.

106. The allegations in Paragraph 106 constitute legal conclusions or legal argument to which no response is required. PGE denies that there is a requirement under the applicable rules for a utility to provide information and access to facilitate an independent system impact study.

107. PGE denies that it has an obligation to provide Complainant with an explanation regarding why PGE has refused to consent to Complainant hiring a third-party consultant to complete the interconnection studies.

108. PGE denies the allegations in Paragraph 108.

109. PGE denies the allegations in Paragraph 109.

- 110. PGE denies the allegations in Paragraph 110.
- 111. PGE denies the allegations in Paragraph 111.
- 112. PGE denies the allegations in Paragraph 112.
- 113. PGE denies the allegations in Paragraph 113.
- 114. PGE denies the allegations in Paragraph 114.
- 115. PGE denies the allegations in Paragraph 115.
- 116. PGE denies the allegations in Paragraph 116.
- 117. PGE denies the allegations in Paragraph 117.
- 118. PGE denies the allegations in Paragraph 118.
- 119. PGE denies the allegations in Paragraph 119.
- 120. PGE denies the allegations in Paragraph 120.
- 121. PGE denies the allegations in Paragraph 121.
- 122. PGE denies the allegations in Paragraph 122.
- 123. PGE denies the allegations in Paragraph 123.

#### **COMPLAINANT’S THIRD CLAIM FOR RELIEF**

**WACONDA SOLAR IS ENTITLED TO RELIEF BECAUSE PGE FAILED TO MEET INTERCONNECTION APPLICATION DEADLINES REQUIRED UNDER THE COMMISSION’S RULES.**

124. In answer to the allegations in Paragraph 124, PGE repeats and realleges the responses made to Paragraphs 1 through 123.

125. The allegations in Paragraph 125 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 125 also characterize federal and Oregon regulations, which speak for themselves.

126. The allegations in Paragraph 126 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 126 also characterize Oregon regulations, which speak for themselves.

127. The allegations in Paragraph 127 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 127 also characterize Oregon regulations, which speak for themselves.

128. The allegations in Paragraph 128 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 128 also characterize Oregon regulations, which speak for themselves.

129. PGE denies the allegations in Paragraph 129.

130. The allegations in Paragraph 130 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 130 also characterize Oregon regulations, which speak for themselves.

131. The allegations in Paragraph 131 constitute legal conclusions or legal argument to which no response is required. PGE denies it violated the Commission's rules. PGE denies that it did not make reasonable good-faith efforts to follow the scheduled set forth in the study agreement.

132. The allegations in Paragraph 132 constitute legal conclusions or legal argument to which no response is required. PGE denies that it violated the Commission's rules. PGE denies it failed to respond within a reasonable amount of time to Complainant's questions.

133. PGE denies the allegations in Paragraph 133.

134. The allegations in Paragraph 134 constitute legal conclusions or legal argument to which no response is required. PGE denies that Complainant is entitled to relief. PGE denies that



it violated the Commission's rules. PGE denies that it failed to make reasonable, good-faith efforts to meet the Commission's deadlines, to reasonably follow the study timelines, or to respond to Complainant's questions in a reasonable amount of time. PGE denies any other allegations in Paragraph 134.

#### **COMPLAINANT'S FOURTH CLAIM FOR RELIEF**

**WACONDA SOLAR IS ENTITLED TO RELIEF BECAUSE PGE SUBJECTED WACONDA SOLAR TO UNDUE OR UNREASONABLE PREJUDICE OR DISADVANTAGE AND TREATED OTHER PEOPLE AND PGE'S OWN PROJECTS WITH UNDUE OR UNREASONABLE PREFERENCE OR ADVANTAGE.**

135. In answer to the allegations in Paragraph 135, PGE repeats and realleges the responses made to Paragraphs 1 through 134.

136. The allegations in Paragraph 136 constitute legal conclusions or legal argument to which no response is required. The allegations in Paragraph 136 also characterize Oregon statutes, which speak for themselves.

137. The allegations in Paragraph 137 constitute legal conclusions or legal argument to which no response is required. PGE denies that it subjected Complainant to undue and/or unreasonable prejudice or disadvantage by not processing Complainant's interconnection application in a timely manner.

138. The allegations in Paragraph 138 constitute legal conclusions or legal argument to which no response is required. PGE denies it gave undue and/or unreasonable preference to itself and other interconnection applicants by hiring third-party consultants to complete its own interconnection studies or for other interconnection applicants. PGE has not refused to hire a third-party consultant to complete interconnection studies for Complainant's interconnection request; in fact, PGE hired a third-party consultant to conduct a portion of the analysis underlying the System Impact Study for the Complainant's Project.

139. The allegations in Paragraph 139 constitute legal conclusions or legal argument to which no response is required. PGE denies it subjected Complainant to undue and/or unreasonable prejudice or disadvantage by refusing to give its consent to allow Complainant to hire third-party consultants to complete the interconnection studies.

140. The allegations in Paragraph 140 constitute legal conclusions or legal argument to which no response is required. PGE denies it engaged in undue and unreasonable prejudice against Complainant or that PGE engaged in undue and unreasonable preference for PGE's interconnections or other interconnection applications. PGE denies that Complainant is entitled to relief.

#### **PRAYER FOR RELIEF**

141. PGE denies any allegations contained in Paragraph 1 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 1 of Complainant's Prayer for Relief.

142. PGE denies any allegations contained in Paragraph 2 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 2 of Complainant's Prayer for Relief.

143. PGE denies any allegations contained in Paragraph 3 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 3 of Complainant's Prayer for Relief.

144. PGE denies any allegations contained in Paragraph 4 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 4 of Complainant's Prayer for Relief.

145. PGE denies any allegations contained in Paragraph 5 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 5 of Complainant's Prayer for Relief.

146. PGE denies any allegations contained in Paragraph 6 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 6 of Complainant's Prayer for Relief.

147. PGE denies any allegations contained in Paragraph 7 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 7 of Complainant's Prayer for Relief.

148. PGE denies any allegations contained in Paragraph 8 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 8 of Complainant's Prayer for Relief.

149. PGE denies any allegations contained in Paragraph 9 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 9 of Complainant's Prayer for Relief.

150. PGE denies any allegations contained in Paragraph 10 of Complainant's Prayer for Relief and requests that the Commission deny the relief requested in Paragraph 10 of Complainant's Prayer for Relief.

151. PGE denies that it violated any of the statutes or regulations cited in Paragraph 11 of the Complainant's Prayer for Relief, PGE denies any allegations in Paragraph 11 of Complainant's Prayer for Relief, and PGE requests that the Commission deny the relief requested in Paragraph 11 of Complainant's Prayer for Relief.

152. PGE requests that the Commission deny the relief requested in Paragraph 12 of Complainant's Prayer for Relief.

#### **IV. AFFIRMATIVE DEFENSES**

##### **FIRST AFFIRMATIVE DEFENSE**

153. The Complaint fails to state a claim upon which relief can be granted.

##### **SECOND AFFIRMATIVE DEFENSE**

154. PGE has processed Complainant's interconnection request in good faith and with reasonable diligence.

155. To the extent that PGE has missed any of the deadlines established by the Commission's interconnection rules or the study agreements, such delay was not caused by an attempt to frustrate, prejudice or prevent Complainant's interconnection request.

156. Any failure to meet deadlines under the Commission's rules or the study agreements was harmless error, has not prejudiced Complainant, has not prevented Complainant from proceeding with its proposed interconnection, and has not prevented Complainant from achieving interconnection and commercial operation by the February 1, 2020 date selected by Complainant in its PPA.

##### **THIRD AFFIRMATIVE DEFENSE**

157. PGE complied with the Commission's small generator interconnection rules and with the Commission's orders.

158. The Feasibility Study satisfies the requirements of the Commission's rules and orders.

159. The Revised Feasibility Study satisfies the requirements of the Commission's rules and orders.

160. The System Impact Study satisfies the requirements of the Commission's rules and orders.

161. There is no basis upon which to conclude that PGE has substantively or intentionally violated the Commission's rules or orders with regard to Complainant's interconnection application.

#### **FOURTH AFFIRMATIVE DEFENSE**

162. Complainant has failed to state a claim that PGE subjected Complainant to undue or unreasonable prejudice or disadvantage or treated other QFs and PGE's own projects with undue or unreasonable preference or advantage.

163. Complainant has made no specific factual allegations to support its claim of undue prejudice against Complainant and undue preference for other projects or for PGE's projects. Complainant's allegations of undue prejudice or undue preference are so vague and ambiguous that they do not state a claim and do not allow PGE to prepare a meaningful defense.

#### **FIFTH AFFIRMATIVE DEFENSE**

164. PGE has not subjected Complainant to undue and/or unreasonable prejudice or disadvantage.

165. PGE has not given undue and/or unreasonable preference to itself or to other interconnection applicants.

166. PGE has hired third-party consultants to conduct aspects of interconnection studies for interconnection requests other than Complainant's interconnection request.

167. PGE has hired a third-party consultant to assist with aspects of the interconnection study process for Complainant's interconnection request

168. PGE is willing to hire third-party consultants as necessary to conduct engineering and construction of interconnection facilities and system upgrades on Complainant's interconnection project.

169. PGE is not obligated to agree to allow Complainant or any other interconnection applicant to hire their own third-party consultants to conduct interconnection studies or to conduct engineering and construction of required interconnection facilities and system upgrades.

170. PGE is generally unwilling to agree to allow Complainant or other interconnection applicants to hire their own third-party consultants to conduct the interconnection studies or to conduct the engineering and construction of required interconnection facilities and system upgrades because it reduces PGE's legitimate control over changes to its system, increases the cost and complexity associated with coordinating the engineering and construction of interconnection facilities and system upgrades, and creates the possibility of a conflict of interest by the third-party contractor who is working for the interconnection applicant but must insure that all adverse system impacts are identified and all improvements meet PGE's needs and standards.

171. Given that reliability of PGE's system and human safety is at stake, PGE generally prefers to conduct interconnection study work and interconnection construction work itself or to hire its own third-party consultants to conduct studies or to engineer and construct necessary interconnection facilities or system upgrades.

172. PGE's unwillingness to agree to Complainant hiring a third-party to conduct the remaining interconnection study is not discriminatory and is within PGE's discretion and the Commission should dismiss Complainant's claims of undue prejudice and preference.

## V. CONCLUSION

PGE respectfully requests that the Commission deny Complainant's requested relief and dismiss the First Amended Complaint with prejudice.

Dated this 1st day of November 2018.

Respectfully submitted,



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Donald Light, OSB #025415  
Assistant General Counsel  
Portland General Electric Company  
121 SW Salmon Street, 1WTC1301  
Portland, Oregon 97204  
(503) 464-8315 (phone)  
(503) 464-2200 (fax)  
[donald.light@pgn.com](mailto:donald.light@pgn.com)



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**EXHIBIT A**

**FEASIBILITY STUDY AGREEMENT**

UM 1971

Waconda Solar LLC

vs.

Portland General Electric Company

PGE's Answer



Waconda Solar  
SPQ0172

Form 3  
8-21-09 rev.



**Small Generator Facility  
Feasibility Study Agreement**

This Agreement is made and entered into this 17<sup>th</sup> day of April (*month and year*) by and between Waconda Solar, LLC, ☐ an individual ☒ a company, ("Applicant") and Portland General Electric Company, a corporation existing under the laws of the State of Oregon, ("PGE"). Applicant and PGE each may be referred to as a "Party," or collectively as the "Parties."

**Recitals:**

**Whereas**, Applicant is proposing to develop a Small Generator Facility or adding generating capacity to an existing Small Generator Facility consistent with the Application completed on March 23, 2018; and

**Whereas**, Applicant desires to interconnect the Small Generator Facility with PGE's Transmission & Distribution (T&D) System; and

**Whereas**, Applicant has requested for PGE to perform a Feasibility Study to assess the feasibility of interconnecting the proposed Small Generator Facility to PGE's T&D System.

**Now, therefore**, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1. When used in this Agreement, with initial capitalization, the terms specified shall have the meanings set forth in this Agreement or as given in OAR 860-082-0005 through 860-082-0085 and to the extent that this Agreement conflicts with the Rules, the Rules shall take precedence.
2. Applicant elects and PGE shall cause to be performed a Feasibility Study consistent with OAR 860-082-0060(6).
3. The scope of the Feasibility Study shall be subject to the assumptions set forth in the Rule and detailed in Attachment A to this Agreement.
4. The Feasibility Study shall be based on the technical information provided by Applicant in its Application, as may be modified as the result of the Scoping Meeting. PGE reserves the right to request additional technical information from Applicant as may reasonably become necessary consistent with Good Utility Practice during the course of the Feasibility Study. If, in the course of the Study, Applicant finds it necessary to modify the Application, the time to complete the Feasibility Study may be extended.

Waconda Solar  
SPQ0172

Form 3  
8-21-09 rev.

5. In performing the study, PGE will rely, to the extent reasonably practicable, on existing studies of recent vintage. Applicant will not be charged for such existing studies. OAR 860-082-0035 details cost responsibility associated with any new study or modifications to existing studies that are reasonably necessary to perform the Feasibility Study.
6. The Feasibility Study report shall provide the following information:
  - 6.1 An identification of the potential Adverse System Impacts on PGE's transmission and/or distribution system or any Affected System.
  - 6.2 Preliminary identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection,
  - 6.3 Preliminary identification of any thermal overload or voltage limit violations resulting from the interconnection, and
  - 6.4 Preliminary description and non-bonding estimated cost of facilities required to interconnect the Small Generator Facility to PGE's T&D System and to address the identified short circuit and power flow issues.
7. As required by OAR 860-082-0060(8)(a), the public utility will provide scope for the Facilities Study, a reasonable schedule for completion of the study, and a good-faith, non-binding cost estimate to perform the study (Attachment B). The Feasibility Study shall be completed and the results shall be transmitted to Applicant within sixty (60) calendar days after this Agreement is signed by the Parties unless an alternate schedule has been agreed to by parties. Attachment B shall be incorporated as part of this Agreement.
8. Study fees will be based on actual costs in accordance with the provisions of the Rule as detailed in 860-082-0035 and as follows:
  - 8.1 The non-binding good faith estimate of the cost to complete the Feasibility Study is \$4,000. Applicant is required to pay a deposit of fifty (50) percent this estimate or \$1,000, whichever is less, prior to start date of study.
  - 8.2 Any study fees shall be based on PGE's actual costs and will be invoiced to Applicant after the study is completed and delivered and will include a summary of professional time.
  - 8.3 Applicant must pay any study costs that exceed the deposit without interest within thirty (30) calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, PGE shall refund such excess within thirty (30) calendar days of the invoice without interest.

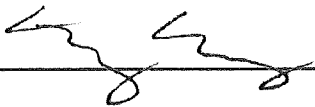
Waconda Solar  
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**Signatures:**

In witness whereof, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For APPLICANT:

Signature: \_\_\_\_\_

Printed Name: Troy Snyder

Title (if any): Manager

Date: April 17, 2018

For PORTLAND GENERAL ELECTRIC COMPANY:

Signature: \_\_\_\_\_

Printed Name: BRUCE BARNEY

Title: SPECIALIZED PROGRAMS  
MANAGER

Date: APR 26 2018

Waconda Solar  
SPQ0172

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**Attachment A**  
**Feasibility Study Agreement**  
**Assumptions Used in Conducting the Feasibility Study**

The Feasibility Study will be based upon the information set forth in the Application and agreed upon in the Scoping Meeting held on April 11, 2018 (*write "N/A" if Scoping Meeting was waived by both Parties*).

Below to be completed by PGE in consultation with Applicant.

1. Designation of Point of Interconnection and configuration to be studied.

As detailed in Site Plan submitted with Interconnection Application.

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2. Designation of alternative Point(s) of Interconnection and configuration.

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3. Other Assumptions.

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Waconda Solar  
SPQ0172

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**Attachment B**  
**Feasibility Study Agreement**  
**PGE Provided Scope, Schedule and Budget for Feasibility Study**

PGE will study the existing distribution (up to and including PGE's sub-transmission system) system to identify if the proposed generation system can interconnect safely and reliably with the existing facilities. If it is determined that a safe and reliable interconnection cannot occur an initial scope of work to PGE's system will be identified. The scope of work will detail the necessary interconnection requirements.

PGE estimates the study will cost \$4,000.00. PGE will need at least 60 business days to complete the study from the time we receive both the signed study agreement and the initial study deposit of \$1000.00.

**EXHIBIT B**

JULY 10 EMAIL

UM 1971

Waconda Solar LLC  
vs.  
Portland General Electric Company

PGE's Answer

**Subject:** Waconda Solar - Feasibility Study Report

**Date:** Tuesday, July 10, 2018 at 4:25:15 PM Pacific Daylight Time

**From:** Small Power Production

**To:** Troy Snyder

**CC:** Nikee Weber

Troy,

PGE has completed the Feasibility Study for Waconda Solar. Attached is the report.

I have also included the System Impact Study Agreement. If you elect to proceed please provide a copy of the signed System Impact Study Agreement along with the \$1,000 deposit within 15 business days. The due date for both is July 31, 2018.

Please let me know if you have any questions.

Thank you,



**Jason Zappe**

Customer Generation Specialist • 503-464-7264

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**EXHIBIT C**  
**SYSTEM IMPACT STUDY AGREEMENT**

UM 1971

Waconda Solar LLC  
vs.  
Portland General Electric Company

PGE's Answer



Waconda Solar  
SPQ0172

Form 4  
8-21-09 rev.



**Small Generator Facility  
System Impact Study Agreement**

This Agreement is made and entered into this 27<sup>th</sup> day of July 2018 (month and year) by and between Waconda Solar, LLC, ☐ an individual ☒ a company, ("Applicant") and Portland General Electric Company, a corporation existing under the laws of the State of Oregon, ("PGE"). Applicant and PGE each may be referred to as a "Party," or collectively as the "Parties."

**Recitals:**

**Whereas**, Applicant is proposing to develop a Small Generator Facility or adding generating capacity to an existing Small Generator Facility consistent with the Application completed on March 23, 2018; and

**Whereas**, Applicant desires to interconnect the Small Generator Facility with PGE's Transmission & Distribution (T&D) System; and

**Whereas**, PGE has completed a Feasibility Study and provided the results of said study to Applicant (This recital to be omitted if the Parties have agreed to forego the Feasibility Study.); and

**Whereas**, Applicant has requested PGE perform a System Impact Study to assess the impact of interconnecting the Small Generator Facility to PGE's T&D System.

**Now, therefore**, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1. When used in this Agreement, with initial capitalization, the terms specified shall have the meanings set forth in this Agreement or as given in OAR 860-082-0005 through 860-082-0085 and to the extent that this Agreement conflicts with the Rules, the Rules shall take precedence.
2. Applicant elects and PGE shall cause to be performed a System Impact Study consistent with OAR 860-082-0060(7).
3. The Parties shall set out the assumptions to be used in conducting the System Impact Study in Attachment A which is incorporated as part of this Agreement.
4. The System Impact Study will be based upon the results of the Feasibility Study, if applicable, technical information provided in the Application, and by Attachment A to this Agreement. PGE reserves the right to request additional technical information from Applicant as may reasonably become necessary consistent with Good Utility Practice during the course of the System Impact Study. If Applicant modifies its

SYSTEM IMPACT STUDY AGREEMENT FOR SMALL GENERATOR FACILITY, PAGE 1 OF 4

Waconda Solar  
SPQ0172

Form 4  
8-21-09 rev.

designated Point of Interconnection, Application, or the technical information provided therein is modified, the time to complete the System Impact Study may be extended.

5. The System Impact Study report shall provide the following information:

5.1 Identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection,

5.2 Identification of any thermal overload or voltage limit violations resulting from the interconnection,

5.3 Identification of any instability or inadequately damped response to system disturbances resulting from the interconnection, and

5.4 Description and good faith non-binding cost estimate of facilities required to interconnect the Small Generator Facility to PGE's T&D System and to address the identified short circuit, instability, and power flow issues.

6. As required by OAR 860-082-0060(7)(a), Attachment A to this Agreement provides a detail of the scope for the System Impact Study, a reasonable schedule for completion of the study, and a good-faith, non-binding estimate of the cost to perform the System Impact Study. The System Impact Study shall be completed and the results transmitted to the Applicant within sixty (60) business days after this Agreement is signed by the Parties unless otherwise agreed to as part of this Agreement. Attachment A shall be incorporated as part of this Agreement.

7. PGE may require a study deposit as described OAR 860-082-0035 of the Rule.

8. Study fees and cost responsibility are described in OAR 860-082-0035 of the Rule and will be based on actual costs and as follows:

8.1 The non-binding good faith estimate of the cost to complete the System Impact Study is \$5,000. Applicant is required to pay a deposit of fifty (50) percent of estimate or \$1,000, whichever is less, prior to start date of study.

8.2 Any study fees shall be based on PGE's actual costs and will be invoiced to Applicant after the study is completed and delivered and will include a summary of professional time.

8.3 Applicant must pay any study costs that exceed the deposit without interest within thirty (30) calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, PGE shall refund such excess within thirty (30) calendar days of the invoice without interest.

Waconda Solar  
SPQ0172

Form 4  
8-21-09 rev.

9. Cost responsibility is detailed in OAR 860-082-0035 of the Rule.

**Signatures:**

In witness whereof, the Parties have caused this Agreement to be executed by their respective duly authorized representatives.

For APPLICANT:

Signature: 

Printed Name: Troy Snyder

Title (if any): Manager

Date: 7/27/2018

For PORTLAND GENERAL ELECTRIC COMPANY:

Signature: 

Printed Name: BRUCE BARNEY  
SPECIALIZED PROGRAMS  
Title: MANAGER

Date: AUG 10 2018

Waconda Solar  
SPQ0172

Form 4  
8-21-09 rev.

**Attachment A**

**System Impact Study Agreement  
PGE Provided Scope, Schedule, and Budget for System Impact Study**

Pursuant to 860-082-0060(7)(g) the System Impact Study will consist of a short circuit analysis, stability analysis, power flow analysis, voltage drop and flicker studies, protection and set point coordination studies, and grounding reviews as necessary.

The System Impact Study shall be completed and the results transmitted to the Applicant within sixty (60) business days.

The non-binding good faith estimate of the cost to complete the System Impact Study is \$5,000. Applicant is required to pay a deposit of fifty (50) percent of estimate or \$1,000, whichever is less, prior to start date of study.

**EXHIBIT D**

JULY 12 EMAIL

UM 1971

Waconda Solar LLC  
vs.  
Portland General Electric Company

PGE's Answer

**Subject:** Re: Waconda Solar - Feasibility Study Report

**Date:** Thursday, July 12, 2018 at 9:54:27 AM Pacific Daylight Time

**From:** Troy Snyder

**To:** Small Power Production

**CC:** Nikee Weber

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

Thank you for sending the Feasibility Study for Waconda Solar. I have reviewed it and have a handful of questions.

1. What is the rating of the existing capacitor bank and recloser? And, where is it located?
2. What kind of recloser currently exists and what pole is it on?
3. If the generation on the transformer is 12.45 MW, how can the generation on the feeder be 15.47 MW?
4. If the line is currently rated to 10 MW, and Waconda puts the total generation on the line to 15.47 MW, wouldn't a project ahead of Waconda in the queue be subject to reconductoring? If so, what size conductor are they upgrading to?
5. If the transformer is rated at 14 MW and there is 15.47 MW of generation on the feeder, wouldn't this cause problems?
6. If the daytime minimum load is only 1.79 MW, why did the Kale Patch project not require transfer trip?
7. Please provide me with a copy of any actual studies and analysis that were conducted as part of this Feasibility Study.
8. Please provide a list of the higher queued projects that were taken into account as part of this study.

Thank you.

Troy

On Tue, Jul 10, 2018 at 4:25 PM, Small Power Production <[Small.PowerProduction@pgn.com](mailto:Small.PowerProduction@pgn.com)> wrote:

Troy,

PGE has completed the Feasibility Study for Waconda Solar. Attached is the report.

I have also included the System Impact Study Agreement. If you elect to proceed please provide a copy of the signed System Impact Study Agreement along with the \$1,000 deposit within 15 business days. The due date for both is July 31, 2018.

Please let me know if you have any questions.

Thank you,



**Jason Zappe**

Customer Generation Specialist • 503-464-7264

**PortlandGeneral.com** • Follow us on social @PortlandGeneral

--

Troy Snyder

TLS Capital, Inc.

Phone: 503-816-6608

**EXHIBIT E**

JULY 27 COMPLAINANT EMAIL

UM 1971

Waconda Solar LLC

vs.

Portland General Electric Company

PGE's Answer



**From:** [Troy Snyder](#)  
**To:** [Small Power Production](#)  
**Cc:** [Nikee Weber](#); [Irion Sanger](#)  
**Subject:** Re: Waconda Solar - Feasibility Study Report  
**Date:** Friday, July 27, 2018 3:45:25 PM  
**Attachments:** [image001.png](#)  
[Waconda Solar SPO0172 - System Impact Study Agreement - Signed.pdf](#)

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\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

Attached is the executed System Impact Study Agreement for Waconda Solar. A hard copy, along with the required deposit has been placed in the mail.

While my questions from the Feasibility Study have not been answered and I am unable to make business decisions based on the inconsistencies within that study, I am returning the System Impact Study Agreement solely to preserve Waconda Solar's position in the interconnection queue. Also, I once again ask that you respond to and answer the questions from my previous email.

Further, because of the inconsistencies within the Feasibility Study and that fact that portions of it are simply not correct, I am asking that Waconda Solar have a third party engineer complete the remaining studies as allowed in OAR 860-082-0060.

Please respond to both this email and my previous emails without delay.

Troy

On Wed, Jul 25, 2018 at 12:50 PM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Can you please respond and answer the questions from my previous email?

Troy

On Tue, Jul 17, 2018 at 10:06 AM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Can you please respond and answer the questions from my previous email?

Troy

On Thu, Jul 12, 2018 at 9:54 AM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Thank you for sending the Feasibility Study for Waconda Solar. I have reviewed it and have a handful of questions.

**EXHIBIT F**

JULY 27 PGE EMAIL

UM 1971

Waconda Solar LLC  
vs.  
Portland General Electric Company

PGE's Answer

**From:** [Small Power Production](#)  
**To:** [Troy Snyder](#)  
**Cc:** [Nikee Weber](#)  
**Subject:** RE: Waconda Solar - Feasibility Study Report  
**Date:** Friday, July 27, 2018 5:54:00 PM  
**Attachments:** [image004.png](#)

Troy,

I appreciate your feedback on the Waconda Solar Feasibility Study Report. There are some errors that I can clear up.

The approximate 2.5 miles of reconductor needed is from the intersection of 50<sup>th</sup> Ave and Waconda Rd along Waconda Rd to Portland Hwy 99E. It is currently rated at 336 AAC which has a summer load carrying capacity of 10 MW. The amount of existing and proposed generation when you include Waconda Solar is 11.65 MW. I know the 11.65 MW of generation is different from our report. The report indicated there was 15.47 MW of generation on the feeder. This was incorrect. Below is a list of existing and queue generation on the Waconda-13 feeder which demonstrates the total to be 11.65 MW. This particular section of the feeder is on the path leading back to the Waconda Substation. It will need to be reconducted due to the amount of generation which will be feeding into the Waconda Substation.

Queue Position Number	County	Tier	Status	MW AC	Type	Feeder	Substation
SPQ0003	Marion	4	Completed	2.200	Solar	Waconda 13	Waconda
SPQ0028	Marion	4	Interconnection Agreement	2.200	Solar	Waconda 13	Waconda
SPQ0048	Marion	4	Facility Study	2.500	Solar	Waconda 13	Waconda
SPQ0158	Marion	4	System Impact Study	2.500	Solar	Waconda 13	Waconda
SPQ0172	Marion	4	System Impact Study	2.250	Solar	Waconda 13	Waconda

The capacitor bank is located between Duck Inn Rd and 86<sup>th</sup> Ave. The capacitor bank is rated for 300 kVar and I can obtain more details from our distribution engineer if needed. The recloser is located near the corner of Wapato St and 71<sup>st</sup> Avenue. It is currently a hydraulic recloser which is not capable of reverse power. The recloser has a maximum continuous current rating of 140 amps. The recloser is on pole number C6203A-7.

The rating of the Waconda BR1 substation transformer is 25 MW. The BR1 transformer serves both the Waconda-13 feeder and the Waconda-River feeder. There is a second substation transformer at Waconda which is known as BR2 and it is rated at 15 MW. The BR2 substation transformer was included in the study report in error.

At the time of the review for Kale Patch Solar the daytime minimum load was much higher. With the installation of SPQ0003 and the recent mild spring (reduced load) has caused the daytime minimum load to drop considerably.

Please let me know what other questions you may have.

**Jason Zappe** • Customer Generation Specialist • 503-464-7264

**From:** Troy Snyder <troy@tlscapital.com>  
**Sent:** Friday, July 27, 2018 4:15 PM  
**To:** Small Power Production <Small.PowerProduction@pgn.com>  
**Subject:** Re: Waconda Solar - Feasibility Study Report

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

I appreciate you getting back to me, but I don't understand why it takes weeks or even months for you to answer questions that should have been addressed within the studies. With Mt Hope for example, I sent my questions on 5/31, with numerous follow up emails, but have yet to even get a response. It is now 57 days later. And, with Waconda, there are significant errors and inconsistencies within the Feasibility Study. When I ask about them, I am ignored. I am generally pretty patient, but as you can imagine, I am starting to get fairly frustrated.

Once again, I am asking that I have a third party engineer complete the remaining studies as allowed in OAR 860-082-0060. If you and/or PGE do not even have the bandwidth to respond to questions in a reasonable time frame, this request should come as a relief.

Troy

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Troy,

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Thanks,

**Jason Zappe** • Customer Generation Specialist • 503-464-7264

---

**From:** Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)>

**Sent:** Friday, July 27, 2018 3:45 PM

**To:** Small Power Production <[Small.PowerProduction@pgn.com](mailto:Small.PowerProduction@pgn.com)>

**Cc:** Nikee Weber <[Nikee.Weber@pgn.com](mailto:Nikee.Weber@pgn.com)>; Irion Sanger <[irion@sanger-law.com](mailto:irion@sanger-law.com)>

**Subject:** Re: Waconda Solar - Feasibility Study Report

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

Attached is the executed System Impact Study Agreement for Waconda Solar. A hard copy, along with the required deposit has been placed in the mail.

While my questions from the Feasibility Study have not been answered and I am unable to make business decisions based on the inconsistencies within that study, I am returning the System Impact Study Agreement solely to preserve Waconda Solar's position in the interconnection queue. Also, I once again ask that you respond to and answer the questions from my previous email.

Further, because of the inconsistencies within the Feasibility Study and that fact that portions of it are simply not correct, I am asking that Waconda Solar have a third party engineer complete the remaining studies as

allowed in OAR 860-082-0060.

Please respond to both this email and my previous emails without delay.

Troy

On Wed, Jul 25, 2018 at 12:50 PM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Can you please respond and answer the questions from my previous email?

Troy

On Tue, Jul 17, 2018 at 10:06 AM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Can you please respond and answer the questions from my previous email?

Troy

On Thu, Jul 12, 2018 at 9:54 AM, Troy Snyder <[troy@tlscapital.com](mailto:troy@tlscapital.com)> wrote:

Jason,

Thank you for sending the Feasibility Study for Waconda Solar. I have reviewed it and have a handful of questions.

1. What is the rating of the existing capacitor bank and recloser? And, where is it located?
2. What kind of recloser currently exists and what pole is it on?
3. If the generation on the transformer is 12.45 MW, how can the generation on the feeder be 15.47 MW?
4. If the line is currently rated to 10 MW, and Waconda puts the total generation on the line to 15.47 MW, wouldn't a project ahead of Waconda in the queue be subject to reconductoring? If so, what size conductor are they upgrading to?
5. If the transformer is rated at 14 MW and there is 15.47 MW of generation on the feeder, wouldn't this cause problems?
6. If the daytime minimum load is only 1.79 MW, why did the Kale Patch project not require transfer trip?
7. Please provide me with a copy of any actual studies and analysis that were conducted as part of this Feasibility Study.
8. Please provide a list of the higher queued projects that were taken into account as part of this study.

Thank you.

Troy

--

Troy Snyder  
TLS Capital, Inc.  
Phone: 503-816-6608

--

Troy Snyder  
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Phone: 503-816-6608

--

Troy Snyder  
TLS Capital, Inc.  
Phone: 503-816-6608

--

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TLS Capital, Inc.  
Phone: 503-816-6608

On Tue, Jul 10, 2018 at 4:25 PM, Small Power Production <[Small.PowerProduction@pgn.com](mailto:Small.PowerProduction@pgn.com)> wrote:

Troy,

PGE has completed the Feasibility Study for Waconda Solar. Attached is the report.

I have also included the System Impact Study Agreement. If you elect to proceed please provide a copy of the sign System Impact Study Agreement along with the \$1,000 deposit within 15 business days. The due date for both is July 31, 2018.

Please let me know if you have any questions.

Thank you,



**Jason Zappe**

Customer Generation Specialist • 503-464-7264

**PortlandGeneral.com** • Follow us on social @PortlandGeneral

--

Troy Snyder  
TLS Capital, Inc.

Phone: 503-816-6608

**EXHIBIT G**

JULY 27 9:43PM EMAIL

UM 1971

Waconda Solar LLC  
vs.  
Portland General Electric Company

PGE's Answer



**From:** [Troy Snyder](#)  
**To:** [Small Power Production](#)  
**Cc:** [Nikee Weber](#)  
**Subject:** Re: Waconda Solar - Feasibility Study Report  
**Date:** Friday, July 27, 2018 9:43:59 PM  
**Attachments:** [image004.png](#)

---

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

I appreciate the new information. Considering that more than half of the feasibility study was not correct, can you please provide me with an updated/correct feasibility study?

Also, while I am still digesting the new information and will probably have additional questions, can you please help me understand a few things right now -

- Reconductoring - if the section of the line that needs reconductoring is along Waconda Rd, between 50th Ave and Portland Hwy, how is this 2.5 miles? The actual distance appears to be about half of that. Am I missing something?
- Capacitor Bank - if the capacitor bank is between Duck Inn Rd and 86th, how is this effected by Waconda Solar? It is not in the path between the POI and substation. Rather, this location is at a minimum 1.25 miles east of the POI or the path back to the sub.
- With Kale Patch, since it could back feed onto PGE's transmission system and they are not installing protection equipment, how is PGE's system protected if a fault were to occur?

Also, and once again, I am asking that I have a third party engineer complete the remaining studies as allowed in OAR 860-082-0060.

Troy

On Fri, Jul 27, 2018 at 5:54 PM, Small Power Production <[Small.PowerProduction@pgn.com](mailto:Small.PowerProduction@pgn.com)> wrote:

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Please let me know what other questions you may have.

**Jason Zappe** • Customer Generation Specialist • 503-464-7264

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**Cc:** Nikee Weber <[Nikee.Weber@pgn.com](mailto:Nikee.Weber@pgn.com)>; Irion Sanger <[irion@sanger-law.com](mailto:irion@sanger-law.com)>  
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Troy

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Troy Snyder

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Phone: 503-816-6608

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Please let me know if you have any questions.

Thank you,



**Jason Zappe**

Customer Generation Specialist • 503-464-7264

**PortlandGeneral.com** • Follow us on social @PortlandGeneral

--

Troy Snyder

TLS Capital, Inc.

Phone: 503-816-6608

--

Troy Snyder

TLS Capital, Inc.

Phone: 503-816-6608

**EXHIBIT H**

AUGUST 17 EMAIL

UM 1971

Waconda Solar LLC

vs.

Portland General Electric Company

PGE's Answer

**Subject:** Re: Revised Waconda Solar - Feasibility Study Report  
**Date:** Friday, August 17, 2018 at 10:24:13 AM Pacific Daylight Time  
**From:** Troy Snyder  
**To:** Small Power Production  
**CC:** Nikee Weber

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Jason,

Thank you for the revised study. However, I would still like to receive an accurate and correct study. Particularly,

- In the revised study, it states that the load on the transformer is 15.95 MW (which is different than anything provided in the first study) but then later in the study it states that the load on the transformer is 12.45 MW.
- It appears that the revised study removed the requirement to replace the capacitor bank, yet the cost estimate stayed the same. Can you provide an explanation? A detailed cost estimate would be helpful.
- In the original study, I was told reconductoring was one thing. In your email on 8/27, it was another, and now the revised study is stating that it is different than either of those. Can you please provide more detail and the line ratings for each of the sections you are stating needs to be reconductored? Again, this requirement changed but the cost estimate did not.
- The study states that it considers all "generating facilities having a pending higher queued Interconnection Request to interconnect to the Distribution System " yet it appears that some upgrades that other generators would be responsible for, are being double counted in this study, ie fiber. Can you please update or provide an explanation?

Thank you.

Troy

On Thu, Aug 16, 2018 at 9:26 AM, Small Power Production <[Small.PowerProduction@pgn.com](mailto:Small.PowerProduction@pgn.com)> wrote:

Troy,

In an effort to address your questions and provide additional details PGE has revised the Waconda Solar Feasibility Study Report. Attached is the revised study.

Additionally, PGE has kicked off the System Impact Study (SIS) and the SIS will be completed by October 25, 2018.

Please let us know if you still have questions.

Thank you,





**Jason Zappe**

Customer Generation Specialist • 503-464-7264

**PortlandGeneral.com** • Follow us on social @PortlandGeneral

--

Troy Snyder

TLS Capital, Inc.

Phone: 503-816-6608

**EXHIBIT I**

AUGUST 24 LETTER

UM 1971

Waconda Solar LLC

vs.

Portland General Electric Company

PGE's Answer

## Sanger Law PC

1117 SE 53rd Ave. Portland, OR 97215

tel (503) 756-7533 fax (503) 334-2235 irion@sanger-law.com

---

August 24, 2018

Via Email

David White  
Associate General Counsel  
Portland General Electric Company  
1 World Trade Center, Ste 1300  
121 SW Salmon Street  
Portland, OR 97204

RE: Waconda Solar Interconnection Studies – Third-Party Consultants

Dear Mr. White:

Waconda Solar, LLC (“Waconda Solar”) writes to formally request that Portland General Electric Company (“PGE”) allow Waconda Solar to hire third-party consultants to complete the System Impact Study and Facilities Study and to request that PGE disclose its system configuration so that an independent consultant can complete its study. PGE’s studies to date for Waconda Solar and other small generators have been subject to material delays and included significant errors, and Waconda Solar hopes to avoid these issues by retaining a third-party consultant. Please provide Waconda Solar a list of independent third-party consultants that PGE finds acceptable, and the process in which PGE will review and approve of a different independent third-party consultant that Waconda Solar can select if it chooses a consultant that is not on PGE’s list.

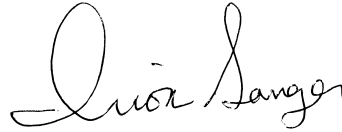
Under OAR 860-082-0060(9), PGE and Waconda Solar may agree in writing to allow Waconda Solar to hire a third-party consultant to complete any of the interconnection studies. PGE cannot unreasonably refuse to agree to allow a third-party consultant to conduct an interconnection study. In light of PGE’s errors in the Waconda Solar Feasibility Study, Waconda Solar believes it makes sense to have another entity complete the next two studies. Therefore, please provide PGE’s consent to allow Waconda Solar to hire a third party, and please provide PGE’s list of approved third-party vendors or the process for selecting an approving of a third-party vendor.

Additionally, Waconda Solar intends to seek an independent System Impact Study under OAR 860-082-0060(7)(h). Waconda Solar needs to make informed business decisions about its project and fears that there will be more errors in any studies done by PGE. An independent study will provide Waconda Solar with a better picture of its project. As such, please provide Waconda Solar with the system configuration so that its independent consultant can complete the study.

Waconda Solar Interconnection Studies  
August 24, 2018  
Page 2 of 2

Thank you. Please do not hesitate to call if you have any questions or clarifications.

Sincerely,

A handwritten signature in black ink, reading "Irion A. Sanger". The signature is written in a cursive style with a large, looped initial "I".

Irion A. Sanger

cc: Waconda Solar, LLC  
c/o Troy L. Snyder, TLS Capital, Inc.

**EXHIBIT J**

SEPTEMBER 7 LETTER

UM 1971

Waconda Solar LLC

vs.

Portland General Electric Company

PGE's Answer



**Portland General Electric Company**  
Legal Department  
121 SW Salmon Street • Portland, Oregon 97204  
503-464-7383 • Facsimile 503-464-2200

**Kristin M. Ingram**  
Assistant General Counsel

**VIA ELECTRONIC MAIL & REGULAR MAIL**

September 7, 2018

Irion A. Sanger  
Sanger Law PC  
1117 SE 53<sup>rd</sup> Avenue  
Portland, OR 97215

RE: Waconda Solar Interconnection Studies / Third Party Consultants

Dear Mr. Sanger,

Portland General Electric Company ("PGE") is in receipt of your letter dated August 24, 2018 regarding Waconda Solar interconnection studies. You have requested that PGE grant Waconda Solar the right to hire a third-party consultant to complete the System Impact Study and Facilities Study per OAR 860-082-0060(9). PGE respectfully denies your request.

If Waconda Solar has any questions or concerns about the results of a given study, Waconda Solar should e-mail PGE at [small.powerproduction@pgn.com](mailto:small.powerproduction@pgn.com).

Sincerely,

A handwritten signature in blue ink, appearing to read "K. Ingram", is written over a faint, larger blue ink signature.

Kristin Ingram  
Assistant General Counsel

**EXHIBIT K**

10/25/18 System Impact Study

UM 1971

Waconda Solar, LLC

vs.

Portland General Electric Company

PGE's Answer

# Portland General Electric



## System Impact Study

Interconnection Request:

Waconda Solar – 2.25 MWAC

SPQ0172

October 25, 2018





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## **1. Introduction**

On March 23, 2018, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for Waconda Solar. The Interconnection Request seeks to interconnect a 2.25 MWAC solar facility located in Marion County, Oregon at GPS coordinates 45.072629, -122.913603. The interconnection point will be on PGE's Waconda-13 distribution feeder connected to the Waconda substation.

As set forth in the Oregon Administrative Rules 860-082-0015(29), PGE has assigned queue number SPQ0172 to the Interconnection Request.

On July 31, 2018, PGE received an executed System Impact Study Agreement with the appropriate deposit from the Interconnection Customer.

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

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

## **2. System Impact Study Scope**

The primary purpose of the System Impact Study is to identify and detail the impacts of the Interconnection Request at the designated Point of Interconnection. This includes identifying and detailing any impacts of the Interconnection Request on PGE's transmission or distribution systems and on any affected systems. This also includes evaluation of any adverse system impacts identified in the feasibility study or the scoping meeting. PGE will identify any required system additions necessary to accommodate the request. The study normally consists of the following:

- 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.
- Documentation of other providers' to the transmission or distribution systems that are impacted, and identification of these providers as Affected Systems. Note, no Affected Systems were identified for this study.
- Documentation of fault interrupting equipment with short circuit capability limits that are exceeded as a result of the interconnection.
- A short circuit analysis and power flow analysis. Note: The results of this analysis is reported in Attachment A.



- Protection and set point coordination studies. Note: The results of these studies are reported in Attachment A.
- Voltage drop, flicker and grounding reviews. Note: The result of these reviews are reported in Attachment A.
- 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. Note: The total non-binding, good faith estimate of cost is \$1,002,700.00.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request. Note: The total non-binding, good faith estimate of time to construct is 24 months.

The System Impact Study considers all generating facilities that, on the date the study was commenced: (i) were directly interconnected to PGE's Distribution System; (ii) were interconnected to Affected Systems and may have an impact on the Interconnection Request; (iii) generating facilities having a pending higher queued Interconnection Request to interconnect to the Distribution System.

### **3. System Impact Study Assumptions**

The System Impact Study considerations include the following assumptions for system conditions for all stages and seasons:

- Generating Facilities and identified PGE electrical system upgrades associated with higher queued Interconnection Requests.
- Waconda Solar was modeled at its maximum capability of 2.25 MWAC.
- The Point of Interconnection will be on PGE's Waconda-13 distribution feeder.
- The nominal voltage level at the Point of Interconnection will 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.
- Generator tripping may be required under certain outages.
- The Generating Facility is expected to operate during daylight hours every day 7 days a week 12 months per year. The Point of Interconnection power factor range



studied was unity power factor or 1.0 as identified by the Interconnection Customer's Small Generator Interconnection Request.

- The interconnection was studied with eighteen (18) CPS, SCH125TL-DO/US-600 inverters with reactive power capabilities as stated in the provided Small Generator Interconnection Request.
- This report is based on information available at the time of the study.

## **4. System Impact Study Interconnection Requirements**

The Interconnection Request was studied such that 100% of the output of the Generation Facility can be delivered to PGE's Distribution System with consideration to existing or higher queued Interconnection Requests.

### **Distribution System Modifications**

With the addition of Waconda Solar the amount of proposed generation will exceed the thermal limits of the existing conductor in two locations. Currently, the conductor along Waconda Road is primarily rated at 336 AAC with some limited lengths of conductor rated at 556AAC. Waconda Solar will need to pay for the reconductoring of two segments of conductor line. The first segment that must be re-conducted is an approximately 2.13 mile segment of overhead conductor, starting 15 feet East of the Rail Road overheard to underground transition, which is near the intersection of Portland Road and Waconda Road. The reconductor will extend to the point of interconnection. The second segment that will need to be reconducted starts near the address of 7020 Wapato St NE and continues south along 71st Ave NE to the point of interconnection, which is approximately .17 miles.

The study identified two protective devices which become overloaded with the interconnection of the Waconda Solar project. The first device is an existing hydraulic recloser (#8425) located on Wapato St NE, which will need to be replaced with an electronic recloser. The second device is a 65T Fuse located on pole 1351 which is adjacent to the point of interconnection on Waconda Rd NE. The existing fuse will be replaced with a 100T fuse.

In addition to the required reconductoring and the replacement of the two protective devices discussed above, the system impact analysis determined that during light and heavy load conditions the Generation 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.

The installation of a new primary service and metering package will also be needed to service the site.

### **Protection Requirements**

The daytime minimum load on the Waconda-13 feeder is 0.18 MW which occurred on 4/22/2018 at 3:08 pm. Additionally the daytime minimum load on the Waconda BR1 substation transformer is 1.79 MW which occurred on 5/13/2018 at 1:28 pm. The Waconda BR1 substation transformer is rated at 25 MW. When you include Waconda Solar the amount of existing and proposed generation on the BR1 substation transformer totals 12.95 MW.

### **Transfer Trip**

Under the conditions outlined above the generation can carry the entire BR1 transformer load and will backflow into the transmission system. This causes the potential for the individual generators to feed one another and slows their response time for disconnection during a fault condition. To ensure the generation is offline within 2 seconds a transfer trip protection scheme is required.

When there is ground fault on the high side of the substation transformer, the line relays will trip the line breakers leaving the substation primary without a ground reference. The DER back-feeding to the primary will create an overvoltage condition on the unfaulted phases of up to 173% of normal phase-ground voltage. Until the fault is cleared and the back feed interrupted, the arresters on the un-faulted phases will be exposed to this overvoltage, and will continuously conduct, leading to thermal runaway and arrester failure. The overvoltage condition can also damage the transformer and the line insulators. At low DER penetration the relatively large stranded load facilitates rapid cessation of the DER; at higher penetration levels the DER removes itself increasingly slowly.

There are two approaches to address this fault induced overvoltage condition:

1. Prevent it by making the substation transformer appear to the transmission system as an effectively grounded source; this would require replacement of the substation transformer with a different configuration or in the installation of a grounding bank.
2. Rapidly detect the overvoltage condition and remove the transformer as a source; this is referred to as 3V0 sensing or as 59N protection.



The first approach is preferable, but considerable more expensive than the second approach. The first approach may be implemented during substation rebuilds; the second approach is how existing substations are being adapted for high penetrations of DER.

Once the DER is separated from the transmission system, it is essential that the DER be tripped to allow the transmission system to reenergize the distribution system without risk of closing in out-of-phase to still energized portions.

To rapidly detect the overvoltage condition, remove the transformer as a source and trip the DER the follow is required:

- Transfer trip to the DER via Mirror Bits

Transfer trip requires running a fiber optic line from the Waconda Substation to the point of interconnection which is approximately 3.6 miles. Proposed preceding interconnections take a similar path from the substation and will cover approximately 2.3 miles of this distance should the projects be constructed. If the higher-queued projects are built and provide for 2.3 miles of fiber optic line, then Waconda Solar would be responsible for the remaining fiber optic line extension of approximately 1.3 miles. If the higher queued projects are not built, Waconda Solar would be responsible for the entire approximately 3.6 miles of fiber optic line extension.

Additionally, to accomplish transfer trip an RTAC will need to be added at the substation. The existing connections are accounted for by higher preceding interconnections. The RTAC allows PGE to expand the communication connections.

## 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.

<b>Distribution Modifications</b>	\$817,000.00
(Recloser, Fuse and Reconductor with RR crossing)	
<b>New Service Metering</b>	\$30,000.00
<b>Communications Requirements</b>	\$121,600.00
(Fiber for Transfer trip)	
<b>Protection Requirements</b>	\$34,100.00
(Work in substation to facilitate Transfer Trip, RTAC)	
<b>Total</b>	<b>\$1,002,700.00</b>



## 6. Schedule

PGE estimates it will require approximately 24 months to engineer, procure and construct the facilities described in this report following the execution of an Interconnection Agreement. The schedule will be further developed and optimized during the Facility Study.

## 7. Higher Queued Projects

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

Currently there are three higher queued Interconnection Requests on Waconda-13 feeder, in addition to one 3.0 MW generation site that has withdrawn from the queue.

SPQ0028	2.2 MW	(higher queued)
SPQ0048	2.5 MW	(higher queued)
SPQ0142	3.0 MW	(withdrawn)
SPQ0158	2.5 MW	(higher queued)
SPQ0172	2.25MW	Waconda Solar, LLC

## 8. Attachment A - Detailed System Impact Study Report (attached below)

Waconda Solar  
Prepared for PGE by POWER Engineers, Inc.

## SYSTEM IMPACT STUDY FOR SPQ0172

Waconda Solar

Prepared for Portland General Electric Company by  
POWER Engineers, Inc.



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## INTERCONNECTION INFORMATION

### Customer Information

Queue Position	SPQ0172
Applicant Name	Waconda Solar
System Impact Study Commitment Date	10/04/2018
Size of Proposed Facility (MW)	2.250 MW
Coordinates or Facility Location	45.072629, -122.913603
Inverter Type(s)	CPS SCH 125KTL-DO-US-600
Engineer Performing SIS	POWER Engineers, Inc
Accounting Work Order (AWO)	1000008370

### Interconnection Summary

System Impact Study was performed for Waconda Solar. Equipment was monitored for voltage, loading, and short circuit violations.

Based on the study results, the following are the distribution related impacts pertaining to this interconnection request:

- Replace hydraulic recloser 8425 with electronic recloser
- Add Dynamic VAR support for flicker
- Install one (1) 300-amp Solid-Blade cutouts and service metering at DER lateral

An operational contingent condition will necessitate a mainline reconductor of 2.13 miles on Waconda Road from about 0.15 feet east of the rail road to overhead/underground transition west of Portland Rd NE.

Depending on POI, if located east of the fuse on Pole No. 1351 (located Waconda Rd NE, east of 72<sup>nd</sup> Ave NE), the existing 65T fuse will need to be replaced with a 100T fuse. Also, an upgrade of up to three spans of A-#2 ACSR, BC- #6 CU will potentially be needed from Pole 1351 to Pole 1354 (900 ft).

The maximum primary voltage fluctuation was measured to be ~4.3% during light loading conditions with upgrades and ~6.6% during heavy loading conditions with upgrades, thus Dynamic VAR Support has been recommended to mitigate these voltage flicker issues.

With the installation of SPQ0172 the amount of existing and proposed generation will exceed the daytime minimum load of the substation transformer.

**Note:** Provide description of how this interconnection will affect the distribution system if no upgrades are made. This section is to be filled out after studies are complete.

### Distribution Line Related Upgrades

Description	Estimated Cost
Recloser Replacement (8425)	\$60,000
Waconda Road Reconductor	\$700,000
Fuse Replacement; 900' of tapline reconductor	\$57,000
New Primary Service and Metering Package	\$30,000

**Note:** This information is solely based on the SIS performed by distribution or planning engineers. Section to be filled out after studies are complete.

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Total Estimated Distribution Line Cost					
INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION					
Queue Pos #	Name	Feeder Name	Xfmr Pos #	DER Size (MW AC)	Status
SPQ0003	Redacted	Waconda-Waconda 13	BR1	2.200	Completed
SPQ0028	Redacted	Waconda-Waconda 13	BR1	2.200	Under Construction
SPQ0048	Redacted	Waconda-Waconda 13	BR1	2.500	Interconnection Agreement
SPQ0142	Redacted	Waconda-River	BR1	3.000	Withdrawn
SPQ0158	Redacted	Waconda-Waconda 13	BR1	2.500	Facility Study
SPQ0172	Waconda Solar, LLC	Waconda-Waconda 13	BR1	2.250	System Impact Study

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# **BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS**

Substation Name	Waconda
Interconnecting Feeder Name	Waconda 13
Substation Transformer Position # (e.g. WR1, BR1)	BR1

## *Light Loading Information*

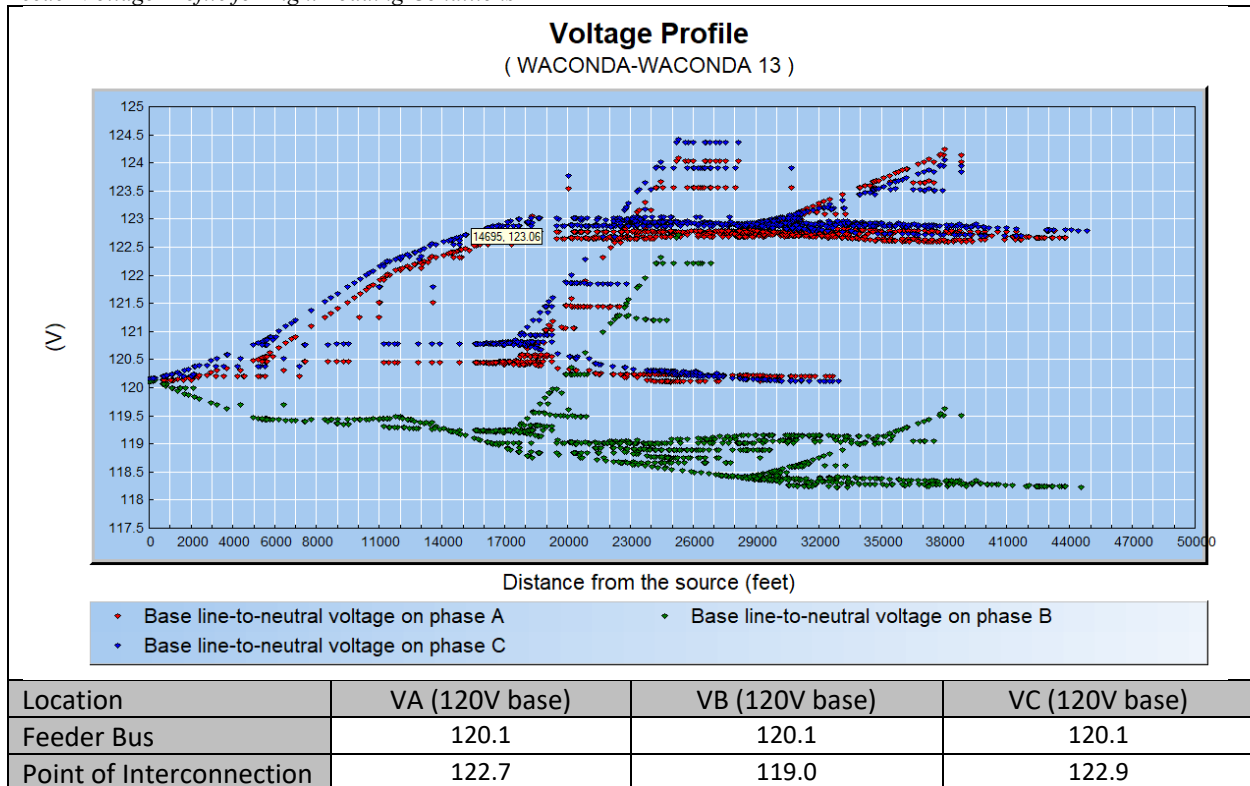
Simulated Date	5/27/2018
Simulated Hour	13:00

## *Feeder Loading Information*

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
Waconda - River	BR1	2671	486
Waconda 13	BR1	562	-720

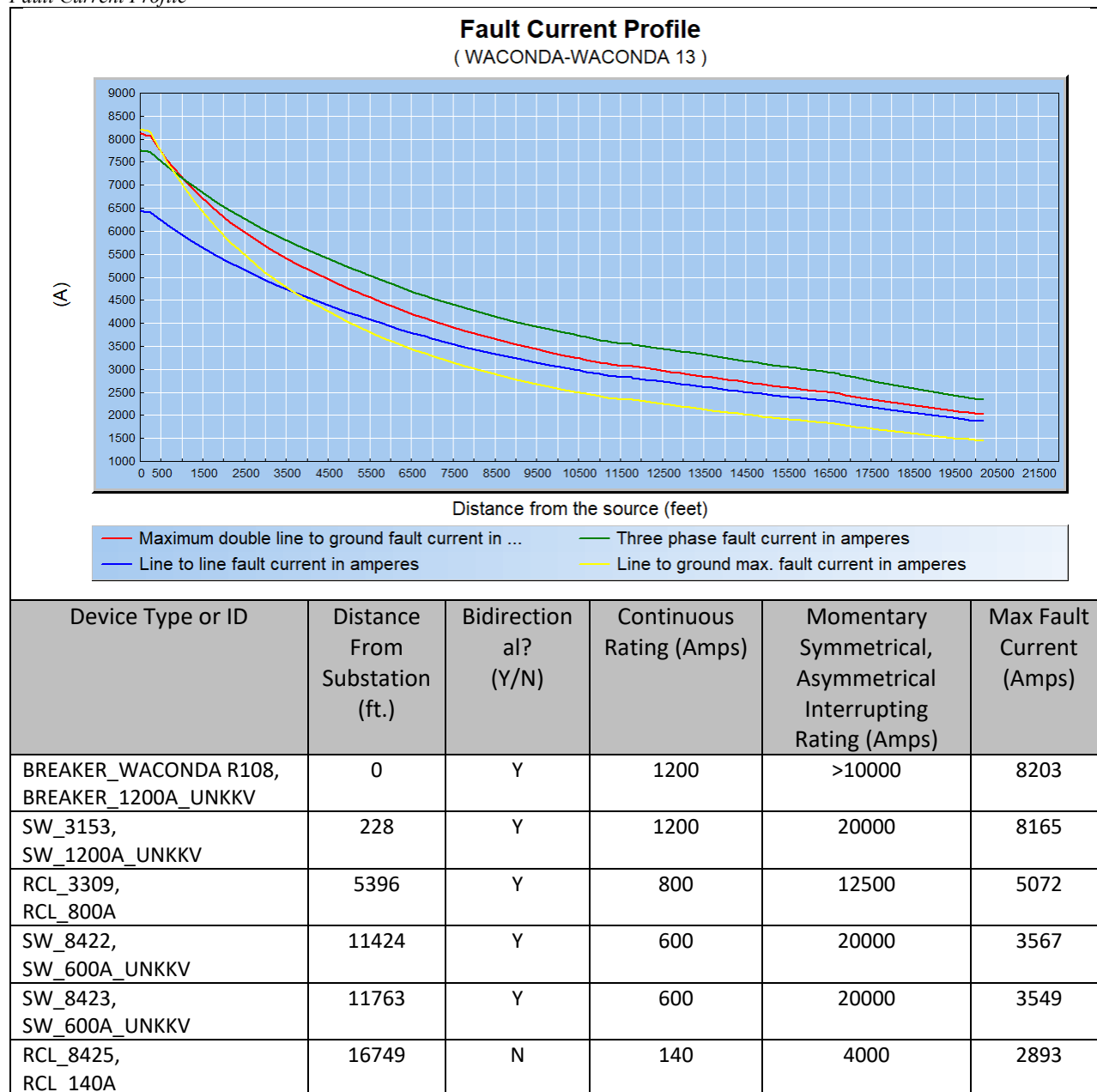
**Note:** List feeders served from the associated transformer or bus of the interconnecting device

## *Feeder Voltage Profile for Light Loading Conditions*



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*Fault Current Profile*



**Note:** List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, sectionalizers, and line regulators

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*Pertinent Violations*

Device Type	General Location	Violation Type	Comments
Fuse, FUSE_14892	Portland Road NE and Riverton St NE	Overload	100T fuse at the Portland Road NE and Riverton St NE has C phase overloaded at 100.2% (100.2A at 100A rated ampacity). Upgrade to mitigate overload fuse not the responsibility of interconnect developer.
Fuse, FUSE_15136	POI lateral and NE Portland Rd intersection	Overload	40T fuse at the POI lateral and NE Portland Rd intersection is overloaded at 280.7% (112.3A at 40A rated ampacity). Upgrade to mitigate overload fuse not the responsibility of interconnect developer.
Recloser, RCL_3309	On Waconda Rd NE at bypass switch 3309	Reverse Power Flow	800A recloser on Waconda Rd NE at bypass switch 3309 has reverse power flow and recloser controller needs to be checked for bidirectional capabilities. Upgrade of recloser control not the responsibility of interconnect developer.

**Note:** Only list violations for the feeder with the proposed DER. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

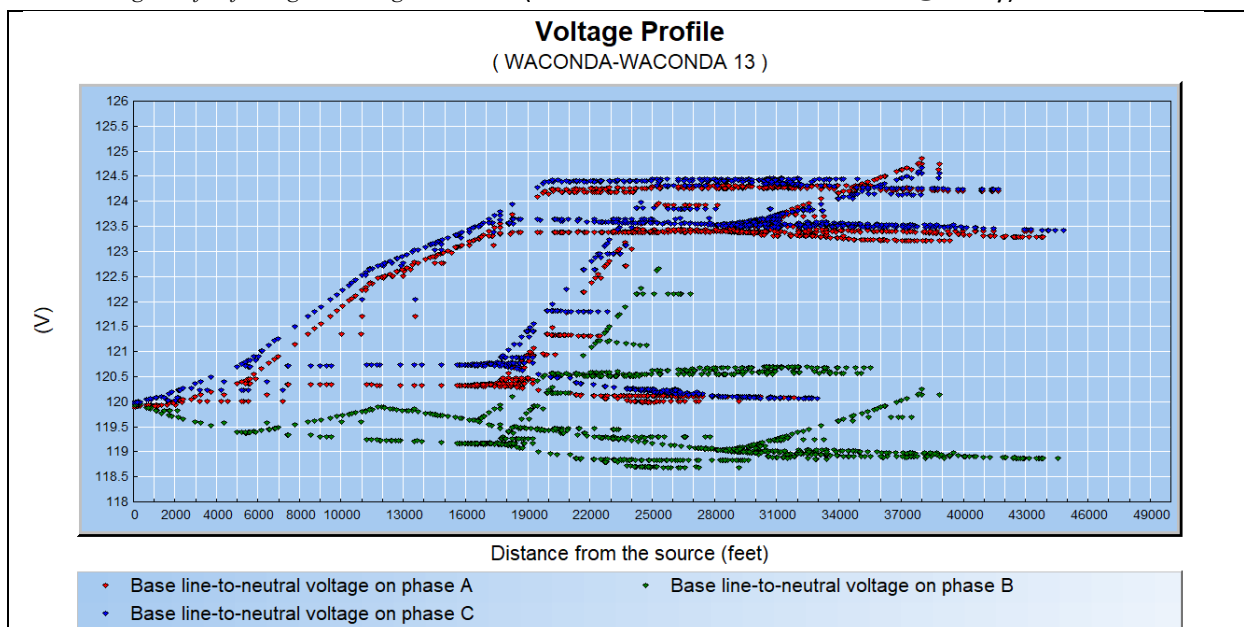
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# **DER INTERCONNECTION – LIGHT LOADING** (DER is connected and in service @ unity)

## *DER Location*

DER Location	
Latitude (DD)	Longitude (DD)
<b>45.072629</b>	<b>-122.913603</b>

## *Feeder Voltage Profile for Light Loading Conditions* (DER is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%
Feeder Bus	122.3	122.2	0.1	122.3	122.1	0.2	122.4	122.1	0.2
POI	126.6	121.6	4.1	123.0	117.9	4.3	126.8	121.8	4.1

**Note:** POI = Point of Interconnection. Will need to turn on/turn off DER and run load flow to determine voltage fluctuation.

*System Backfeed* (Record loading at the source side of the proposed DER facilities' feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	<b>-8878</b>	<b>1976</b>
Transformer (115 or 57kV terminals)	<b>-6267</b>	<b>2651</b>
Substation Source Location	<b>-5616</b>	<b>1402</b>

Note: Negative values from CYME indicate backfeed

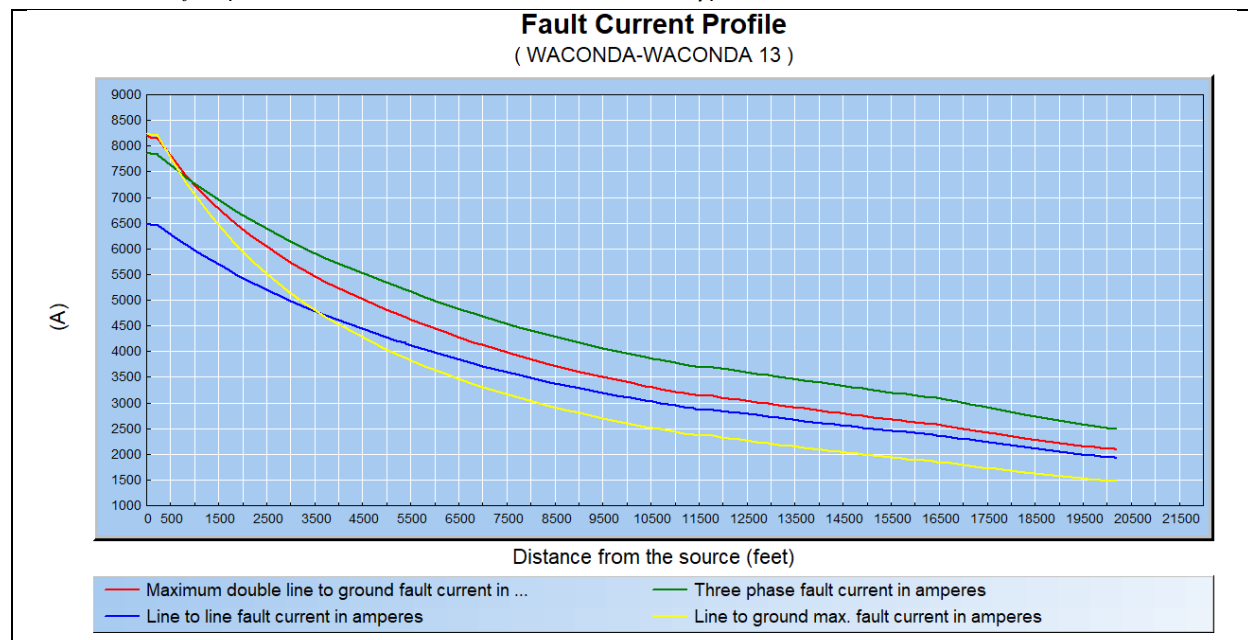


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*Transmission Planning Recommendations* (If there is backfeed onto the transmission system)

**Note:** Provide mitigation strategies and associated costs as proposed by transmission planning engineers. If there is no backfeed onto the transmission system, write "N/A" in the above field.

*Fault Current Profile* (DER is connected and in service @ unity)



Device Type or ID	Distance From Substation (ft)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_WACONDA R108, BREAKER_1200A_UNKKV	0	Y	1200	>10000	8245
SW_3153, SW_1200A_UNKKV	228	Y	1200	20000	8206
RCL_3309, RCL_800A	5396	Y	800	12500	5202
SW_8422, SW_600A_UNKKV	11424	Y	600	20000	3711
SW_8423, SW_600A_UNKKV	11763	Y	600	20000	3693
RCL_8425, RCL_140A	16749	N	140	4000	3048

**Note:** List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, sectionalizers, and line regulators

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*Pertinent Violations*

Device Type	General Location	Violation Type	Comments
Recloser, RCL_8425	On Wapato St NE at bypass switch 8425	Reverse Power Flow	140A recloser on Wapato St NE at bypass switch 8425 has reverse power flow and recloser controller needs to be checked for bidirectional capabilities. Upgrade recloser control to mitigate the reverse power flow if bidirectional capabilities do not exist.

**Note:** Only list new violations for the feeder with the proposed DER. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

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## BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS

### Heavy Loading Information

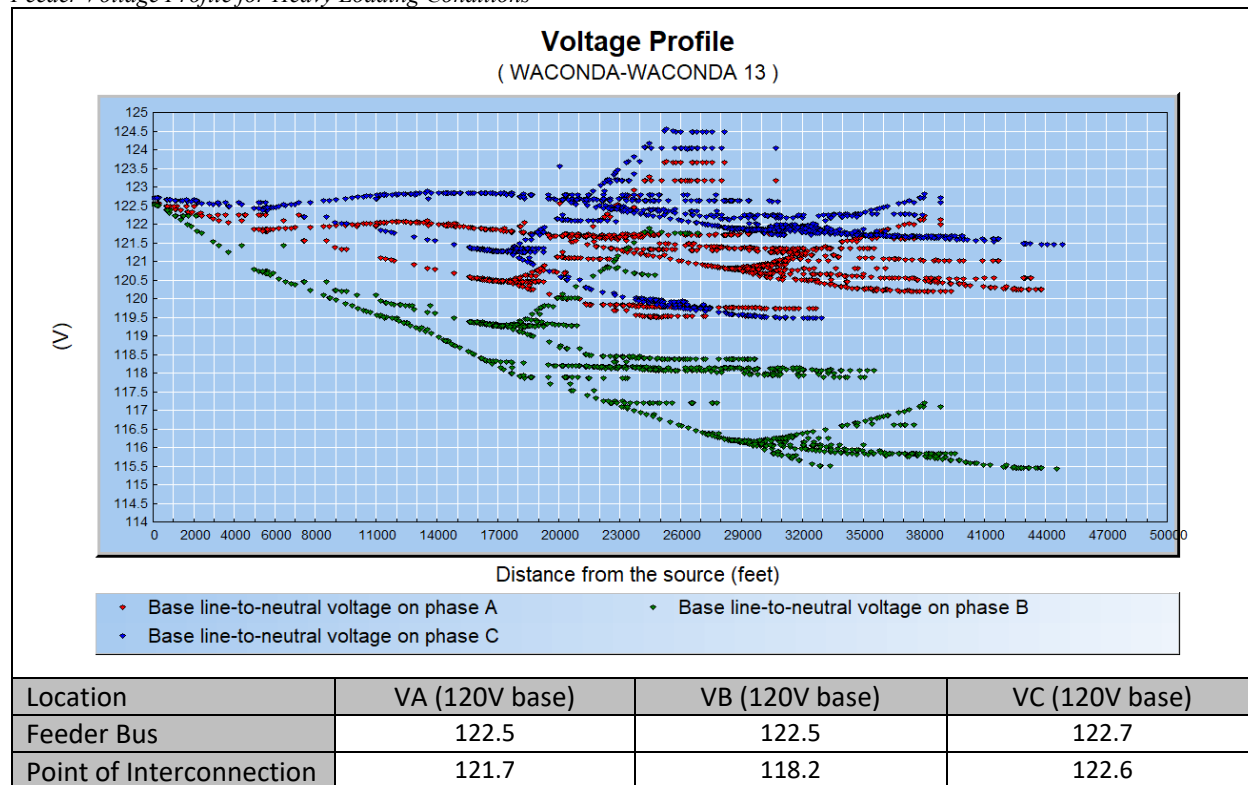
Simulated Date	8/14/2018
Simulated Hour	16:00

### Feeder Loading Information (All feeders served from associated substation transformer)

Feeder Name	Loading (KW)	Loading (KVAR)
Waconda - River	4304	1537
Waconda 13	6689	1742

**Note:** List feeders served from the associated transformer or bus of the interconnecting device

### Feeder Voltage Profile for Heavy Loading Conditions



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*Pertinent Violations*

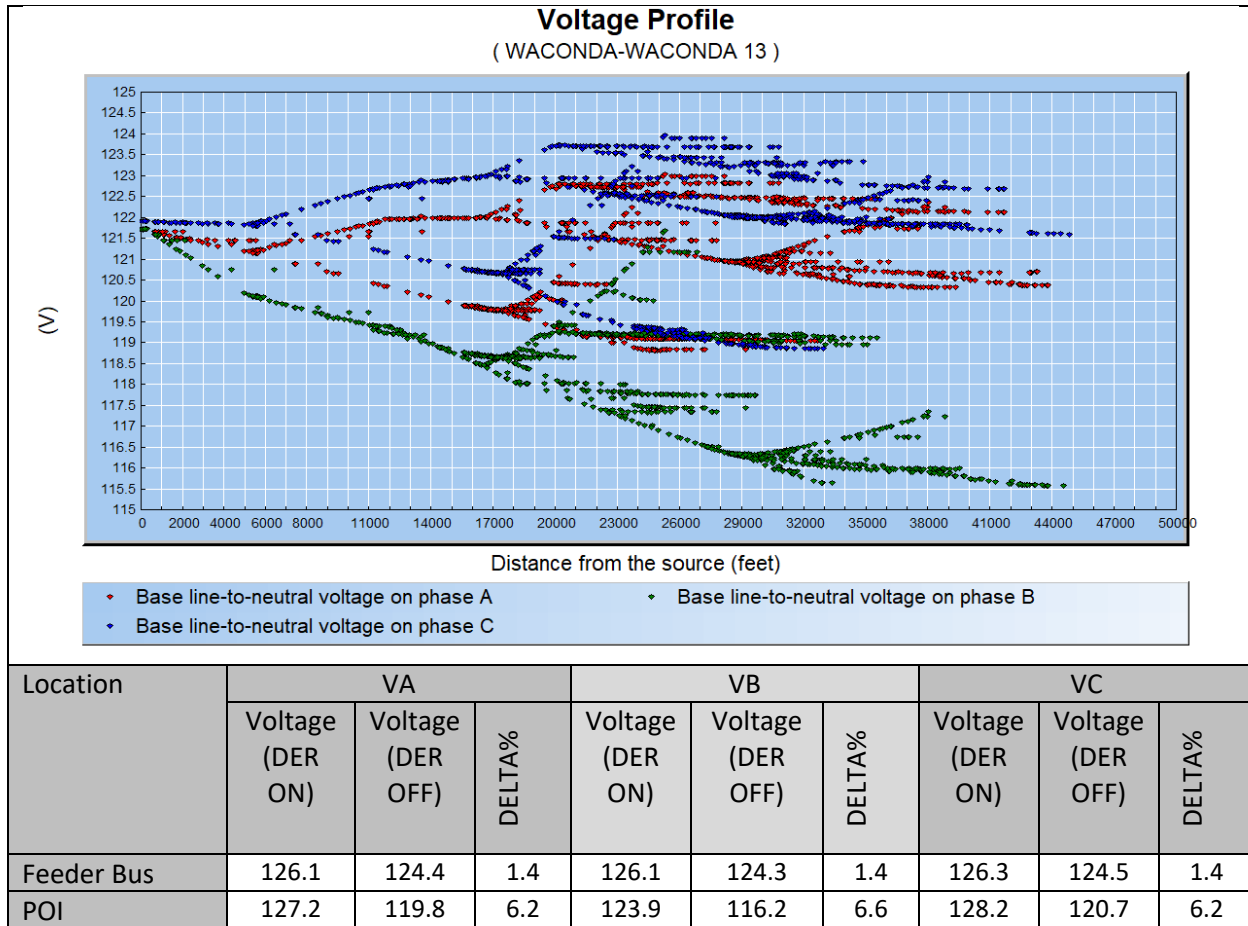
Device Type	General Location	Violation Type	Comments
Fuse, FUSE_15136	POI lateral and NE Portland Rd intersection	Overload	40T fuse at the POI lateral and NE Portland Rd intersection is overloaded at 281.2% (112.5A at 40A rated ampacity). Upgrade to mitigate overload fuse not the responsibility of interconnect developer.
Recloser, RCL_3309	On Waconda Rd NE at bypass switch 3309	Reverse Power Flow	800A recloser on Waconda Rd NE at bypass switch 3309 has reverse power flow and recloser controller needs to be checked for bidirectional capabilities. Upgrade of recloser control not the responsibility of interconnect developer.

**Note:** Only list violations for the feeder with the proposed DER. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

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## DER INTERCONNECTION – HEAVY LOADING

*Feeder Voltage Profile for Heavy Loading Conditions (DER is connected and in service @ unity)*



**Note:** POI = Point of Interconnection. Will need to turn on/turn off DER and run load flow to determine voltage fluctuation.

*System Backfeed* (Record loading at the source side of the proposed DER facilities' feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-3833	2736
Transformer (115 or 57kV terminals)	291	-1450
Substation Source Location	8146	1918

**Note:** Negative values from CYME indicate backfeed

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*Pertinent Violations*

Device Type	General Location	Violation Type	Comments
Recloser, RCL_8425	Wapato St NE at bypass switch 8425	Reverse Power Flow	140A recloser on Wapato St NE at bypass switch 8425 has reverse power flow and recloser controller needs to be checked for bidirectional capabilities. Upgrade recloser control to mitigate the reverse power flow if bidirectional capabilities do not exist.

**Note:** Only list new violations for the feeder with the DER. Violations include Overloads, Under-Voltage, Over-Voltage, Reverse Power Flow, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

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## SYSTEM IMPROVEMENTS – LIGHT LOADING

### *System Improvement Summary*

The improvements needed pertaining to this interconnection:

- Add Dynamic VAR support for flicker
- Install one (1) 300-amp Solid-Blade cutouts and service metering at DER lateral

There are two overloaded fuse banks, one hydraulic recloser that has reverse power flow. These devices did not become a violation due to the addition of the interconnection, SPQ0172, therefore the upgrades pertaining to these violations are not the responsibility of the developer.

**Note:** If no system improvements are needed, write “No additional upgrades are required on the distribution system pertaining to this interconnection request” in the above field.

### *Feeder Voltage Profile for Light Loading Conditions (DER is off)*

Upgrades to support the interconnect will not have system wide impacts on voltage profile.

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

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*Fault Current Profile*

Upgrades to support the interconnect will not have system wide impacts on fault current profile.

Device Type or ID	Distance From Substation (ft)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)

**Note:** List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, sectionalizers, and line regulators

*Pertinent Violations*

Device Type	General Location	Violation Type	Comments

**Note:** None of these violations should supersede base case violations.



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*DER Interconnection – Light Loading* (DER is connected and in service @ unity)

*Feeder Voltage Profile for Light Loading Conditions* (DER is connected and in service @ unity)

Upgrades to support the interconnect will not have system wide impacts on voltage profile.

Location	VA			VB			VC		
	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%
Feeder Bus									
POI									

**Note:** POI = Point of Interconnection. Will need to turn on/turn off DER and run load flow to determine voltage fluctuation

*DER Power Factor*

Range	KW	KVAR	Power Factor (%)
Positive (Lagging)			
Negative (Leading)			

**Note:** Interconnecting device will have an acceptable power factor range in which voltage delta will be acceptable. Determine acceptable positive and negative power factor of the DER.

*System Backfeed* (Record loading at the source side of the proposed DER facilities' feeder breaker, and at the distribution power transformer).

Location	KW	KVAR	Direction (Yes or No)	
			Toward Source?	Toward Load?
Feeder Breaker				
Transformer (115 or 57kV terminals)				

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*Fault Current Profile* (DER is connected and in service @ unity)

Upgrades to support the interconnect will not have system wide impacts on fault current profile.

Device Type or ID	Distance From Substation (ft)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)

**Note:** List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, sectionalizers, and line regulators

*Pertinent Violations*

Device Type	General Location	Violation Type	Comments

**Note:** None of these violations should supersede base case violations.

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## SYSTEM IMPROVEMENTS – HEAVY LOADING

*Feeder Voltage Profile for Heavy Loading Conditions (DER is off)*

Upgrades to support the interconnect will not have system wide impacts on voltage profile.			
Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

*Pertinent Violations*

Device Type	General Location	Violation Type	Comments

**Note:** None of these violations should supersede base case violations.

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*DER Interconnection – Heavy Loading* (DER is connected and in service @ unity)

*Feeder Voltage Profile for Heavy Loading Conditions* (DER is connected and in service @ unity)

Upgrades to support the interconnect will not have system wide impacts on voltage profile.

Location	VA			VB			VC		
	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%	Voltage (DER ON)	Voltage (DER OFF)	DELTA%
Feeder Bus									
POI									

**Note:** POI = Point of Interconnection. Will need to turn on/turn off DER and run load flow to determine voltage fluctuation

*System Backfeed* (Record loading at the source side of the proposed DER facilities' feeder breaker, and at the distribution power transformer).

Location	KW	KVAR	Direction (Yes or No)	
			Toward Source?	Toward Load?
Feeder Breaker				
Transformer (115 or 57kV terminals)				

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*Pertinent Violations*

Device Type	General Location	Violation Type	Comments

**Note:** None of these violations should supersede base case violations.

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## **APPENDIX A: LINKS TO SUPPORTING DOCUMENTATION**

[IEEE](#) – (Reference IEEE 1547-2003)

[Job Aid 1](#) – Minimum Daylight Load

[Job Aid 2](#) – Setting up CYME for an Interconnection Study

[Job Aid 3](#) – Finding Proposed Interconnection Locations

[Job Aid 4](#) – Conducting a CYME Interconnection SI Study

[Power Quality Guidelines](#) – LD19100

[Regulator and LTC Settings](#) – Substation

[Regulator Settings](#) – Feeder

[Small Power \(QF\) Interconnection Queue](#)

[Substation Highside Source Impedances](#)

[System Impact Schedule](#)

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## APPENDIX B: EQUIPMENT RATINGS AND STANDARDS

### Cutouts

Polymeric Cutout Specifications					
Cutout Usage	PGE Part Number	Cutout Type	kV Rating	Amp Rating	
				Continuous	Asymmetrical Interrupting
General	40102	Open dropout	15	100	16,000
Special application	39478			200	12,000
	90006289	Solid blade		300	—

15-kV Solid Blade Cutout Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary (asymmetrical)
90006289	14.4	15.0	300	12,000

Table 10: 15-kV Solid Blade Cutout Ratings

### Gang Operated Switches

15-kV Gang-Operated Switch Fault Ratings				
PGE Part Number	Manufacturer	Peak Withstand (amps, rms, 10 cycles)	Momentary, Symmetrical (amps, rms, three seconds)	Fault Closing (peak amps) <sup>1</sup>
03586	S&C Electric Company Omni-Rupter <sup>2</sup>	65,000	20,000	42,000
	Inertia Engineering LineBOSS	51,000	32,000	30,000
03587	Unassembled S&C Electric Company Alduti-Rupter	40,000	25,000	20,000

### Switches

15-kV Disconnect Switch Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary
03582	15	15.5	1200	61,000

Table 9: 15-kV Disconnect Switch Ratings

Waconda Solar  
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*Reclosers*

Types of Reclosers and Corresponding PGE Part Numbers					
PGE Part Number	Phase	Setting	Continuous Rating	Type	Symmetrical Amps
03398	Single	1A3C	50	L <sup>1</sup>	3000
03399		2A2D	70		4000
03401			100		
03405			140		
03406			50	V4L	3000
39135		1A3C	70		4200
03402			100		6000
39130		2A2D	140		
03403		1A3C	200		
39131		2A2D	280		
03408		1A3C			
39132		2A2D			
03410		1A3C			
39133		2A2D			
03411		1A3C			
39134					
—	Three	Electronic allows a variety of curves	560 and 800 maximum	WE	10,000
03414			800 maximum	VWE	12,000
39756				NOVA	12,500
40242					

1. The L-type recloser is no longer purchased by PGE; it is here for reference only.

*Switchgear*

Switchgear Design Ratings	
Design	Rating
Maximum voltage	15.5 kV
Power frequency	60 Hz
Lightning impulse withstand voltage	95 kV
Power frequency withstand voltage	35 kV
Continuous current	1200 A
Momentary asymmetrical current	40 kA
Fault-closing asymmetrical current	40 kA

**Table 1: Switchgear Design Ratings**



Waconda Solar  
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600-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
39686	3	1	40	14
39687	2	2		

Table 5: 600-A, Pad-Mounted Switchgear Configurations

900-A, Pad-Mounted Switchgear Configurations					
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Switch Way Continuous Rating (amp)	Fault Interrupter Way Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
90008072	2	2	900	600	25
90008073	3	1			
90008074	4	—		—	

Table 7: 900-A, Pad-Mounted Switchgear Configurations

1200-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
01433	4	—	40	35
01434	2	2		14
01435	3	1		
40050 <sup>1</sup>	4	—	61	35
40051 <sup>1</sup>	3	1		

1. This style is currently only used for Intel sites that require a higher fault rating.

Table 3: 1200-A, Pad-Mounted Switchgear Configurations

600-A, Submersible Switchgear Ratings						
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Unit Continuous Rating (amp)	Switchgear Continuous Rating (amp)	Fault Interrupter Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
01425	2	2	600	600	200	12.5
01427	3					
01428		3				

Table 10: 600-A, Submersible Switchgear Ratings

900-A, Submersible Switchgear Dimensions					
Unit Fault Rating (kA, symmetrical)	Total Number of Ways	Tank Width <sup>1</sup> (inch)	Tank Depth <sup>2</sup> (inch)	Bushing Height (inch)	Total Height (inch)
12.5	4	65.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	5	80.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	6	95.4375	40.0625	17.5	26.625
25			40.25	28.75	33

1. Termination side of tank.

2. Depth includes controller enclosure but not bushings.

Table 12: 900-A, Submersible Switchgear Dimensions

IEEE Voltage Range/Clearing Times Table

Voltage range (% of base voltage <sup>a</sup> )	Clearing time(s) <sup>b</sup>
V < 50	0.16
50 ≤ V < 88	2.00
110 < V < 120	1.00
V ≥ 120	0.16

<sup>a</sup>Base voltages are the nominal system voltages stated in ANSI C84.1-1995, Table 1.

<sup>b</sup>DR ≤ 30 kW, maximum clearing times; DR > 30kW, default clearing times.

The voltage deviation when the DER is off line or in service must be within Voltage Guideline limits from 88% to 110% of the nominal voltage at the point of interconnection and the substation bus. The voltage guideline set by IEEE-1547 requires DER to disconnect from the grid or clear at the set time shown.

**CERTIFICATE OF SERVICE**

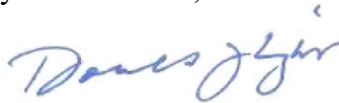
I hereby certify that I have this day caused **PORTLAND GENERAL ELECTRIC COMPANY'S ANSWER TO THE COMPLAINT and EXHIBITS A-K** to be served by First Class US Mail, postage prepaid and properly addressed to the following parties in OPUC Docket No. UM 1971:

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Dated at Portland, Oregon, this 1<sup>st</sup> day of November, 2018.



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