EXHIBIT F – Request for Amendment No. 1

PROPERTY OWNERS

OAR 345-021-0010(1)(f)

TABLE OF CONTENTS

F.1 INTRODUCTION.....F-1

F.2 IDENTIFICATION OF PROPERTY OWNERS.....F-1

TABLES

Table F-1 Property Owners Intersecting or Within 500 Feet of the Amended Site Boundary (updated January 2018).....F-2

FIGURES

Figure F-1 Property Ownership

F.1 INTRODUCTION

OAR 345-021-0010(1)(f) *A list of names and mailing addresses of all owners of record, as shown on the most recent property tax assessment roll, of property located within or adjacent to the site boundary as defined in OAR 345-001-0010. The applicant shall submit an updated list of property owners as requested by the Department before the Department issues notice of any public hearing on the application for a site certificate as described in OAR 345-015-0220. In addition to incorporating the list in the application for a site certificate, the applicant shall submit the list to the Department in electronic format acceptable to the Department for the production of mailing labels. Property adjacent to the site boundary means property that is:*

A) Within 100 feet of the site boundary where the site, corridor or micrositing corridor is within an urban growth boundary;
B) Within 250 feet of the site boundary where the site, corridor or micrositing corridor is outside an urban growth boundary and not within a farm or forest zone; and
C) Within 500 feet of the site boundary where the site, corridor or micrositing corridor is within a farm or forest zone.

Response: This exhibit provides the information required by Oregon Administrative Rules 345-021-0010(1)(f) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station. This exhibit provides updated property ownership information for properties located within or adjacent to the amended Site Boundary. Because the amended Site Boundary is within and adjacent to a farm zone, "adjacent" properties include those located within 500 feet of the amended Site Boundary.

F.2 IDENTIFICATION OF PROPERTY OWNERS

Portland General Electric Company obtained data from Morrow County in 2018 to verify and update the names and mailing addresses of all owners of record, as shown on the most recent property tax assessment roll, of property within 500 feet of the amended Site Boundary. Property ownership would be verified and updated at the request of the Department of Energy prior to issuance of Amendment No. 1 to the Site Certificate. Table F-1 provides the mailing address and name of property owner, the proximity of the property to the amended Site Boundary, and the tax lot and map numbers, as reported by the county in 2016. Figure F-1 shows the property locations, as reported by the county in 2016.

Table F-1 Property Owners Intersecting or Within 500 Feet of the Amended Site Boundary (updated January 2018)

Mailing Address And Name	Relationship to Site Boundary	County	Tax Lot	Map Number
Gen Elec CC Trustees Et Al[1] 90% Portland General Electric 121 SW Salmon Street Portland, Or 97204	Intersects	Morrow	101	03N24E
	Intersects	Morrow	102	03N24E
	Intersects[2]	Morrow	104	03N24E[2]
	Intersects	Morrow	105	02N24E[3]
	Intersects	Morrow	106	02N24E[3]
	Within 500 Feet	Morrow	113	03N24E
	Intersects	Morrow	114	03N24E
	Intersects	Morrow	115	03N24E
	Within 500 Feet	Morrow	116	03N24E
	Intersects	Morrow	117	03N24E[3]
Portland General Electric 121 SW Salmon St Portland, Or 97204	Intersects	Morrow	102	02N24E[3]
	Intersects	Morrow	103	02N24E
	Intersects	Morrow	121	03N24E
	Intersects	Morrow	122	03N24E
Threemile Canyon Farms, LLC Attn: Mr. Martin Myers 75906 Threemile Rd Boardman, OR 97818	Within 500 Feet	Morrow	100	02N24E
	Intersects	Morrow	101	02N24E
	Intersects	Morrow	107	02N24E[3]
	Intersects	Morrow	112	03N24E
	Intersects	Morrow	120	03N24E

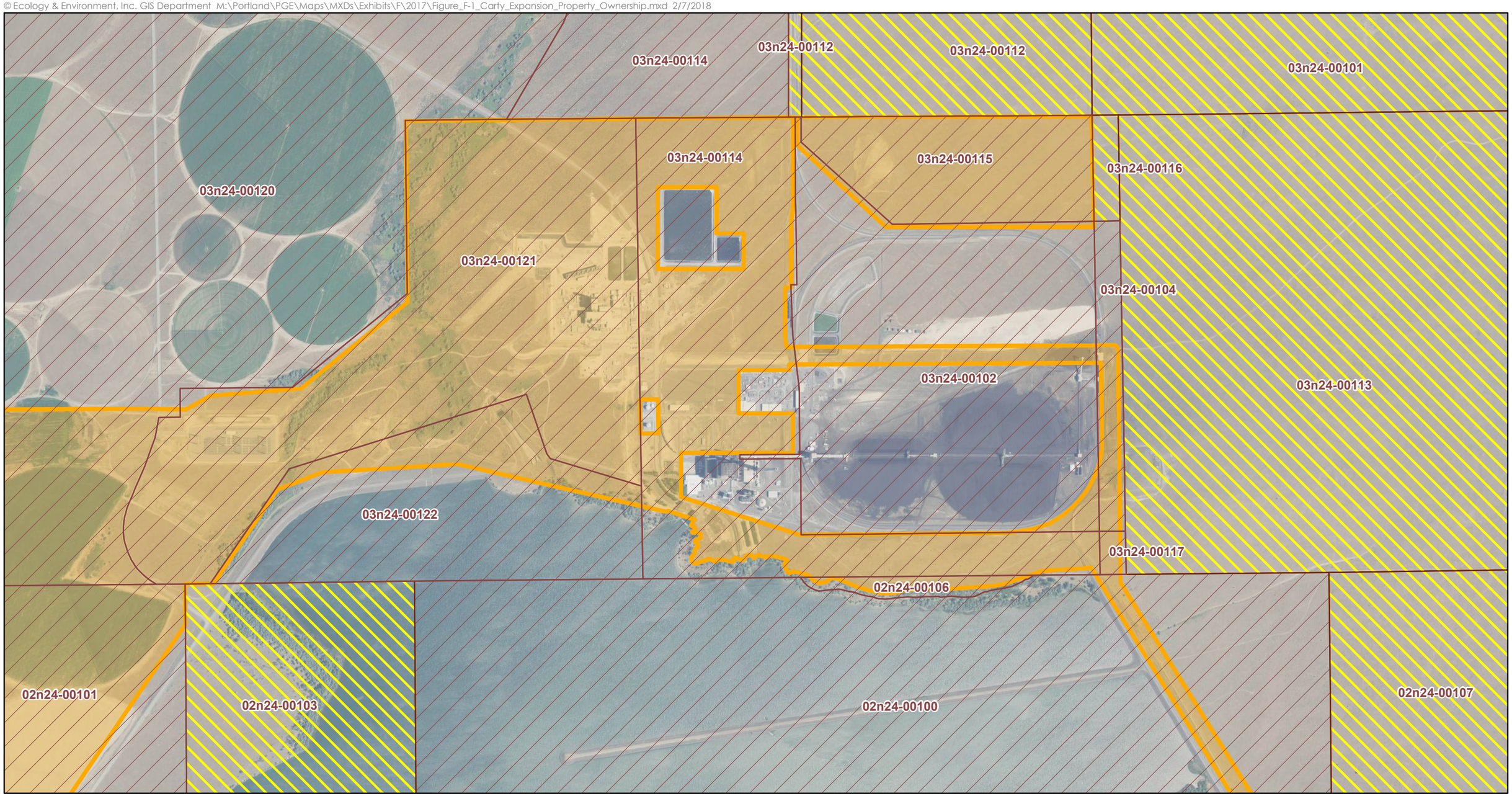
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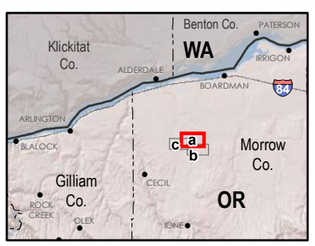
[1] Idaho Power Company is a co-owner of these tax lots, which include the Unit 1 and Carty Solar Farm locations.

[2] For this parcel, the "Relationship to Site Boundary" changed from "Within 500 Feet" (for original Application for Site Certificate) to "Intersects" (for amended Site Boundary).

[3] New parcels intersected by the amended Site Boundary that were not included in the original Application for Site Certificate.

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Amended Site Boundary

Taxlots (Maptaxlot # Labeled)

Intersects Site Boundary

Within 500' of Site Boundary

N

1:13,000

0 250 500 1,000 1,500 Feet

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Figure F-1
Sheet 1 of 3
Property Ownership Adjacent to Site Boundary

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

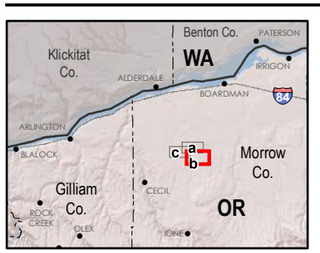
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02n24-00100

02n24-00102

02n24-00105

02n24-00107



Amended Site Boundary

Taxlots (Maptaxlot # Labeled)

Intersects Site Boundary

Within 500' of Site Boundary

N

1:13,000

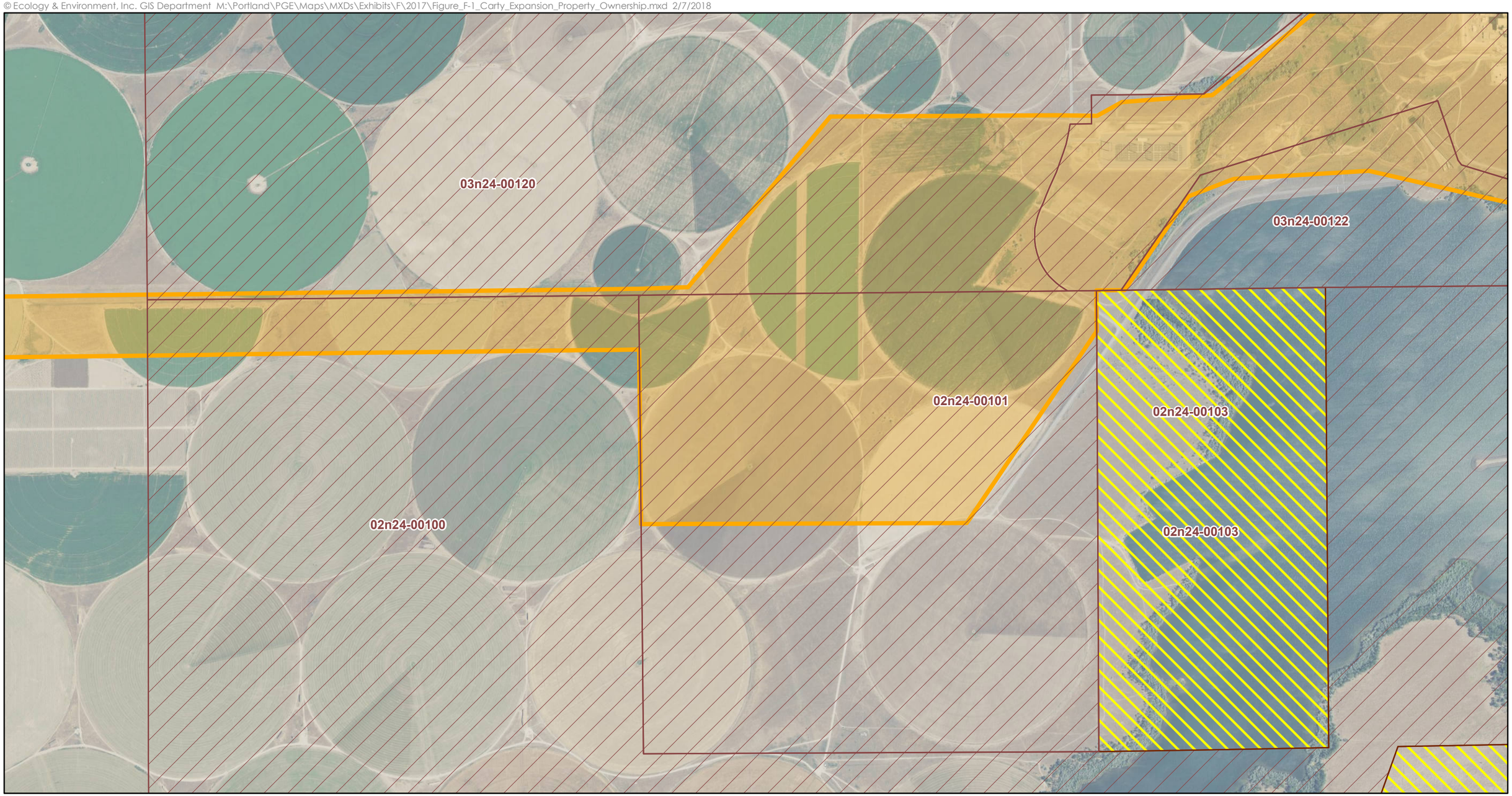
0 250 500 1,000 1,500 Feet

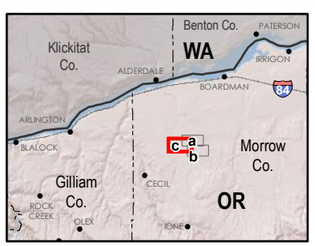
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Figure F-1
Sheet 2 of 3
Property Ownership Adjacent to Site Boundary

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

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Amended Site Boundary

Taxlots (Maptaxlot # Labeled)

Intersects Site Boundary

Within 500' of Site Boundary

N

1:13,000

0 250 500 1,000 1,500 Feet

Copyright:© 2014 Esri
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Figure F-1
Sheet 3 of 3
Property Ownership Adjacent to Site Boundary

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

EXHIBIT G – Request for Amendment No. 1

MATERIALS ANALYSIS

OAR 345-021-0010(1)(g)

TABLE OF CONTENTS

G.1 INTRODUCTION..... G-1

G.2 INVENTORY OF INDUSTRIAL MATERIALS..... G-1

G.3 HAZARDOUS SUBSTANCES AND NON-HAZARDOUS WASTE MATERIALS MANAGEMENT PLANS..... G-1

TABLES

Table G-1 Anticipated Chemical Usage and Storage..... G-2

G.1 INTRODUCTION

OAR 345-021-0010(1)(g) *A materials analysis.*

Response: This exhibit provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(g) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). This exhibit addresses the changes in anticipated materials usage and storage that would be modified under this RFA; the Application for Site Certificate (ASC) provides information regarding materials usage and storage associated with the Carty Generating Station as originally proposed.

G.2 INVENTORY OF INDUSTRIAL MATERIALS

OAR 345-021-0010(1)(g)(A) *An inventory of substantial quantities of industrial materials flowing into and out of the proposed facility during construction and operation.*

Response: The anticipated chemical usage and storage associated with the Carty Generating Station was presented in ASC Table G-1; updated chemical usage and storage associated with this RFA is provided in Table G-1, below. Table G-1 below also reflects changes in the amount of usage and storage anticipated now that Unit 2 will not be constructed.

G.3 HAZARDOUS SUBSTANCES AND NON-HAZARDOUS WASTE MATERIALS MANAGEMENT PLANS

OAR 345-021-0010(1)(g)(B) *The applicant's plans to manage hazardous substances during construction and operation, including measures to prevent and contain spills.*

OAR 345-021-0010(1)(g)(C) *The applicant's plans to manage non-hazardous waste materials during construction and operation.*

Response: Information regarding plans to manage hazardous substances and non-hazardous materials may be found in Exhibit G of the ASC. Information regarding anticipated chemical usage and storage (see Table G-1 in the ASC) is updated below in Table G-1.

As stated in Section G.2.2 of the ASC, the Carty Generating Station is expected to be classified as a Conditionally Exempt Generator, meaning that the Carty Generating Station would produce less than 220 pounds per month of hazardous waste during operation.

Table G-1 Anticipated Chemical Usage and Storage[1]

Material	Purpose	Usage	Maximum Amount Stored	Storage Type
Natural gas	Primary fuel	80 million standard cubic feet per day	None	Not applicable
Sulfuric acid (93%)	Circulating water system and cooling tower	240 gpd – cooling tower	1 x 6,000 gallons 1 x 4,000 gallons	Bulk storage tanks
Corrosion/scale inhibitor	Circulating water system corrosion/scale control	16 gpd – circulating water system	400 gallons	Tote
Biodetergent	Cooling tower basin	10 gallons/week	400 gallons	Tote
Sodium hypochlorite	Biocide in cooling tower, service water	250 gpd – cooling tower 3 gpd – service water	1 x 9,000 gallons 1 x 3,300 gallons	Bulk storage tanks
Sodium bromide	Biocide in cooling tower, service water	100 gpd – cooling tower	1 x 12,000 gallons	Bulk storage tanks
Trisodium phosphate	Boiler feed treatment	2 gpd	400 gallons	Tote
Oxygen scavenger	Feed water oxygen control	0.1 gpd	250 gallons	Tote
Neutralizing amine	Condensate system corrosion control, boiler pH control	0.1 to 0.3 gpd	400 gallons	Tote
Filter aid	Service water pretreatment	12 lbs/day	200 gallons	Tote
Scale inhibitor – reverse osmosis	Cycle makeup reverse osmosis	1 to 2 gpd	120 gallons	Tank
Sodium bisulfite	Dechlorination for reverse osmosis	2 gpd – reverse osmosis	120 gallons	Tank
Sodium hydroxide – 50%	Reverse osmosis and UltraFilter clean in place systems	1 to 2 gpd	4,300 gallons	Tank
Coagulant	Wastewater treatment softening	1 gpd	120 gallons	Tank
Coagulant aid	Wastewater treatment softening	15 lbs/day	400 gallons	Tote
Anhydrous ammonia	Oxides of nitrogen (NO_X) abatement in selective catalytic reduction (SCR)	3,500 lbs/day	15,000 gallons	Bulk storage tanks
Inhibitor	Closed cycle cooling water	0.1 gpd	55 gallons	Drum
Cooling water anti-foam	Cooling tower anti-foam	0.3 to 0.6 gpd	55 gallons	Drum

Table G-1 Anticipated Chemical Usage and Storage[1]

Material	Purpose	Usage	Maximum Amount Stored	Storage Type
Misc. cleaners/degreasers	Equipment maintenance	< 10 gallons/month	440 gallons	5- and 55-gallon drums
Insulating oil	Electrical equipment (inside transformers, etc.)	Initial fill	62,062 gallons – Unit 1 equipment 16,000 gallons – solar equipment	In equipment
Diesel # 2	Fire pump operation	Approximately 15 gallons per month for pump testing, except in fire	100 gallons	Tank, UL listed
Hydrogen	Electrical generator coolant	1,500 standard cubic feet/day – maximum	45,000 cubic feet	Bulk storage
Nitrogen	Heat recovery steam generator layup	As needed	2,000 cubic feet	Returnable cylinders
Lubricating oil	Turbine lubricating oils	< 5 gpd	1,000 gallons	Drums or totes
Carbon dioxide	Gas turbine fire suppression	None, except in fire	4,000 lbs	Pipes and tank
Hydraulic oil	Equipment operations	Initial fill	1,000 gallons	Drums or totes
Misc. lubricants	Lube oils, greases, etc.	< 25 gallons/month	300 gallons	5- and 55-gallon drums

Note:
[1] Table G-1 is updated from Table G-1 of the *Exhibit G, Carty Generating Station Application for Site Certificate*.

Key:

gpd	gallons per day
lbs	pounds
NO_X	oxides of nitrogen
SCR	selective catalytic reduction

EXHIBIT H – Request for Amendment No. 1

GEOLOGY

OAR 345-021-0010(1)(h)

TABLE OF CONTENTS

H.1 INTRODUCTION..... H-1

H.2 GEOLOGIC REPORT..... H-1

H.3 SITE-SPECIFIC GEOLOGIC AND GEOTECHNICAL WORK H-2

H.4 EVIDENCE OF CONSULTATION WITH THE OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES. H-3

H.5 TRANSMISSION LINES..... H-3

H.6 PIPELINES H-4

H.7 SEISMIC HAZARD ASSESSMENT..... H-4

H.8 NON-SEISMIC GEOLOGIC HAZARDS..... H-8

H.9 SEISMIC HAZARD MITIGATION..... H-9

H.10 NON-SEISMIC HAZARD MITIGATION H-9

H.11 REFERENCES..... H-10

TABLES

Table H-1 Deterministic Seismic Hazard Assessment Peak Bedrock Acceleration >0.05g... H-6

APPENDICES

Appendix H-1 Preliminary Geotechnical/Geological Investigations – Carty Solar Farm

H.1 INTRODUCTION

OAR 345-021-0010(1)(h) *Information from reasonably available sources regarding the geological and soil stability within the analysis area, providing evidence to support findings by the Council as required by OAR 345-022-0020:*

Response: This exhibit provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(h) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). The analysis area for this exhibit includes the area within the amended Site Boundary, with the exception of historic earthquake data analysis, which was performed for a larger area, as described in Section H.7. Because the Application for Site Certificate (ASC) provides information regarding the geological and soil stability associated with the Carty Generating Station as originally proposed, this exhibit only addresses the Carty Solar Farm (as defined in Exhibit B). This exhibit was prepared using information from previously published geologic and seismic studies and preliminary site-specific geotechnical site explorations. Detailed geotechnical design recommendations will be prepared in a separate report after additional subsurface explorations and laboratory testing have been completed. The following sections present information required under OAR 345-021-0010(1)(h).

Appendix H-1 was prepared for the previous version of this RFA and submitted to the Oregon Department of Energy in August 2016. Since that submittal, Portland General Electric Company (PGE) has modified its plans for the project. References to Units 2 and 3 are included in Appendix H-1, Figure 2, but are no longer relevant to PGE's amendment request and are not incorporated into the evaluation of compliance with applicable Oregon Energy Facility Siting Council standards.

H.2 GEOLOGIC REPORT

OAR 345-021-0010(1)(h)(A) *A geologic report meeting the guidance in the Oregon Department of Geology and Mineral Industries open file report 00-04 "Guidelines for Engineering Geologic reports and Site-Specific Seismic Hazard Reports."*

Response: Appendix H-1 presents the geologic report that meets the general guidelines in open file report 00-04 for the Carty Solar Farm. PGE's geotechnical consultant, Cornforth Consultants, Inc. (Cornforth Consultants), prepared the geologic report. Site characterization was performed from March 29 to April 8, 2016, and the geologic report summarizes Cornforth Consultants' preliminary geotechnical investigation for locations of the Carty Solar Farm and potential routes for the associated interconnection transmission line.

H.3 SITE-SPECIFIC GEOLOGIC AND GEOTECHNICAL WORK

OAR 345-021-0010(1)(h)(B) *A description and schedule of site-specific geotechnical work that will be performed before construction for inclusion in the site certificate as conditions.*

Response: Cornforth Consultants completed the preliminary geologic and geotechnical site characterization during the period of March 29 through April 8, 2016. The preliminary site work for the Carty Solar Farm included a geologic reconnaissance of the area, drilling four exploratory borings to depths of 50 feet below the existing ground surface, and field electrical resistivity measurements (one location) to evaluate on-site soil conductivity. Refer to Appendix H-1 for the results of the preliminary site characterization for the Carty Solar Farm.

For the Carty Solar Farm, additional site-specific geologic and geotechnical work would be performed during final project design and in advance of construction activities, after the layout of the solar panel arrays and racking systems is developed, structural loads are determined, and other associated on-site electrical equipment and project components are located. These follow-up site investigations and reporting tasks would be completed by registered professional engineers and engineering geologists. The final design of foundation support systems may be completed by a construction contractor's in-house engineering staff or by retained consultants immediately prior to the beginning of project construction.

The additional site investigation work for the Carty Solar Farm would likely include the following:

- Drilling additional borings at scattered locations across the site to further characterize the subsurface conditions as well as collect information for foundation design. For planning purposes, boring depths are anticipated to be approximately 50 feet to achieve 10 to 30 feet penetration into denser overburden soils or to encounter a bedrock contact.
- Completing a laboratory testing program to provide additional data on the soils for design studies. The laboratory data would be used to estimate collapse and settlement potential for any loose, compressible soil layers and to develop foundation soil index and shear strength parameters for design recommendations.
- Conducting geotechnical engineering studies and developing geotechnical recommendations for the final design of foundation support systems, site grading, ground surface treatments, and access road surfaces.
- Preparing a geotechnical design report summarizing the information outlined above.

H.4 EVIDENCE OF CONSULTATION WITH THE OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES.

Additional site-specific geologic and geotechnical work will be performed in the final design phase, as outlined below.

OAR 345-021-0010(1)(h)(C) *Evidence of consultation with the Oregon Department of Geology and Mineral Industries regarding the appropriate site-specific geotechnical work that must be performed before submitting the application for the Department to determine that the application is complete.*

Response: Refer to Section H.4 of the ASC for information regarding initial notification details of the Carty Generating Station. The Oregon Department of Geology and Mineral Industries (DOGAMI) was notified of PGE's intent to prepare an RFA for the Carty Generating Station Site Certificate on March 28, 2016, via a telephone conference between Mr. Bill Burns of DOGAMI and Mr. Darren Beckstrand of Cornforth Consultants. Mr. Beckstrand informed Mr. Burns during the telephone call and follow-up email communication of Cornforth Consultants' geologic reconnaissance and exploratory borings that occurred from March 30 to April 1, 2016, and laboratory testing (completed in April 2016).

Subsequent email communications (Beckstrand/Burns, March 29, 2016) confirmed this consultation with DOGAMI and highlighted several suggestions by DOGAMI for consideration during site evaluations, including a discussion of current building codes. DOGAMI suggested utilizing the Guidelines for Preparing Engineering Geologic Reports (2014 edition), as well as both the codes and guidelines in the standard (2009 International Building Code [IBC]/2010 Oregon Structural Specialty Code [OSSC]) and the current codes and guidelines (2015 IBC/2014 OSSC). These recommendations and guidelines are followed with the information presented in this exhibit. Further discussions between DOGAMI and Cornforth Consultants (Burns/Wang/ Beckstrand) on May 8, 2017, indicated that DOGAMI would ask for compliance with the current code at the time of design and the current OARs, even if the OARs refer to outdated codes.

H.5 TRANSMISSION LINES

OAR 345-021-0010(1)(h)(D) *For all transmission lines, include a description of locations along the proposed route where applicant proposes to perform site-specific geotechnical work, including, but not limited to, railroad crossings, major road crossings, river crossings, dead ends, corners, and portions of the proposed route where geological reconnaissance and other site-specific studies provide evidence of existing landslides or marginally stable slopes that could be made unstable by the planned construction.*

Response: Power generated by the Carty Solar Farm would be transmitted to the extended power grid by a new transmission line: (1) directly to the Grassland Switchyard; (2) to Carty

Generating Station (Unit 1); or (3) to the existing Boardman Power Plant, where it would then be connected to the grid. It is anticipated that the transmission line extending from the Carty Solar Farm generation facility site to the selected interconnection point would be routed via an overhead power pole line. The transmission line would extend along the east side of the Carty Reservoir's east embankment, then along either the northeast and northern limits of the reservoir or north and then west around the coal storage area (see Exhibit B, Figure 4). The subsurface conditions for design of the line would be investigated during final design studies for the project.

The new transmission line from the Carty Solar Farm to the interconnection point would be located in terrain that is relatively flat. This area has no indication of prior geologic-related hazards such as landslides or marginally stable slopes. No significant issues were identified along the potential routes to the interconnection points.

The new power line from the Carty Solar Farm would not cross any major roadways or rivers. It may (depending on the chosen alignment) cross the railroad spur line that supplies coal to the existing Boardman Plant, but the final route has not yet been determined. As discussed earlier, additional site investigations would be performed along the final route of any new power transmission lines.

H.6 PIPELINES

OAR 345-021-0010(1)(h)(E) *For all pipelines that would carry explosive flammable or hazardous materials, a description of locations along the proposed route where the applicant proposes to perform site-specific geotechnical work, including, but not limited to, railroad crossings, major road crossings, river crossings, and portions of the proposed alignment where geological reconnaissance and other site-specific studies provide evidence of existing landslides or marginally stable slopes that could be made unstable by the planned construction.*

Response: There are no pipelines associated with the Carty Solar Farm.

H.7 SEISMIC HAZARD ASSESSMENT

OAR 345-021-0010(1)(h)(F) *An assessment of seismic hazards. For the purposes of this assessment, the maximum probable earthquake (MPE) is the maximum earthquake that could occur under the known tectonic framework with a 10 percent chance of being exceeded in a 50-year period. If seismic sources are not mapped sufficiently to identify the ground motions above, the applicant shall provide a probabilistic seismic hazard analysis to identify the peak ground accelerations expected at the site for a 500-year recurrence interval and a 5000-year recurrence interval. In the assessment, the applicant shall include:*

(i) Identification of the Maximum Considered Earthquake Ground Motion as shown for the site under the 2009 International Building Code (2015 International Building Code values also included at the request of DOGAMI).

Response: The Carty Solar Farm is located in eastern Oregon. Mapped spectral accelerations (SAs) (United States Geological Survey 2002 maps) at the site, based on 2009 IBC values (2,475-year return period, 0.2-second SA and 1.0-second SA), are 0.449 acceleration (g) for short (SS) period motions and 0.141g for 1-second (S1) period motions. Based on preliminary subsurface explorations, the soil profile at the site corresponds to an IBC site class D. The maximum considered earthquake (MCER) ground motions at the site for short periods (SMS) and at 1.0 second (SM1) are 0.647g and 0.316g, respectively.

Mapped spectral accelerations at the site, based on the 2015 IBC (2,475-year return period, 0.2-second SA and 1.0-second SA), are 0.423g and 0.165g, for SS and S1 period motions, respectively. When using the 2009 IBC, these factors result in 0.449g and 0.141g for SS and S1 period motions, respectively. The 2015 IBC-based risk-targeted MCER ground motions at the site for SMS and SM1 are 0.618g and 0.353g, respectively. For the 2009 IBC, these factors are 0.647g and 0.316g for SMS and SM1, respectively. When the OARs reference outdated building codes, the code-based spectra that result in greater spectra accelerations should be used in design. At this location, 2009 IBC controls should be used for short periods (less than 0.5 second), and 2015 IBC controls should be used for longer periods (greater than 0.5 second). The OARs and building codes current at the time of final design will be adhered to during final foundation design. (A comparison of maximum credible earthquake [MCE]and MCER spectra for the 2009 and 2015 IBCs is provided in Appendix H-1, Figure 15.)

(ii) Identification and characterization of all earthquake sources capable of generating median peak ground accelerations greater than 0.05g on rock at the site. For each earthquake source, the applicant shall assess the magnitude and minimum epicentral distance of the maximum credible earthquake (MCE);

Response: Two principal types of earthquake sources that are capable of generating strong ground motions at the site are the Cascadia Subduction Zone (CSZ) "interface" and local crustal faults. The CSZ seismic events result from the Juan de Fuca tectonic plate subducting (sliding) beneath the North American continental tectonic plate, with the CSZ interface events occurring between the two plates. The crustal fault sources identified are those occurring on known, unknown, buried, or random faults in the area. Table H-1 identifies and characterizes the seismic sources capable of generating a peak bedrock acceleration of at least 0.05g at the site. Mean peak bedrock accelerations for crustal sources were calculated using the average of all five enhanced Next-Generation Attenuation-West 2 relationships (Idriss 2014; Campbell and Bozorgnia 2014; Abrahamson, Silva, and Kamai 2014; Boore et al. 2014; and Chiou and Youngs 2014). The peak acceleration estimated for the CSZ interface event was calculated using the averaged mean plus

one standard deviation ground motions from the attenuation relationship described by Addo et al. (2012), Atkinson and Boore (2003), Atkinson and Macias (2009), and Zhao et al. (2006).

Table H-1 Deterministic Seismic Hazard Assessment Peak Bedrock Acceleration >0.05g

Source	Probability of Activity	MCE	Minimum Distance (km)	Mean Peak Acceleration (g)
Horse Haven Hills Structure	1.0	7.1	66	0.06
Rattlesnake-Wallula Fault System	1.0	7.4	71	0.06
Mill Creek Thrust Fault	1.0	7.1	75	0.05
Random Event	1.0	6	10	0.24
CSZ Interface Event	1.0	9	310	0.05

Key:
CSZ Cascade Subduction Zone
g acceleration
km kilometers
MCE maximum credible earthquake

As shown in Table H-1, a random crustal event would control ground motions at the site for potential seismic sources. Other crustal sources in eastern Oregon and Washington and the CSZ Interface Event are located too far from the project site to produce peak bedrock accelerations much greater than 0.05g to 0.06g at the site.

(iii) A description of any recorded earthquakes within 50 miles of the site and of recorded earthquakes greater than 50 miles from the site that caused ground shaking at the site more intense than the Modified Mercalli III intensity. The applicant shall include the date of occurrence and a description of the earthquake that includes its magnitude and highest intensity and its epicenter location or region of highest intensity.

Response: Exhibit H of the ASC described past recorded earthquakes in proximity to the Carty Generating Station site. The only new information provided under this RFA is the listing of three additional earthquakes within 50 miles that took place after submittal of the ASC (United States Geological Survey 2018):

- May 8, 2010, latitude 46.342, longitude -120.218, depth of 7.9 miles, Magnitude 2.6, radial distance 49.5 miles;
- March 12, 2012, latitude 46.165, longitude -119.171, depth of 0 miles, Magnitude 2.6, radial distance 44.9 miles; and
- October 12, 2017, latitude 46.156, longitude -120.540, depth of 8.0 miles, Magnitude 3.4, radial distance 48.6 miles.

(iv) Assessment of the median ground response spectrum from the MCE and the MPE and identification of the spectral accelerations greater than the design spectrum provided in the 2010 Oregon Structural Specialty Code. The applicant shall include a description of the probable behavior of the subsurface materials and amplification by subsurface materials and any topographic or subsurface conditions that could result in expected ground motions greater than those characteristic of the Maximum Considered Earthquake Ground Motion identified above.

Response: The median ground response spectra for the MCE and maximum probable earthquake were compared with the OSSC (2010 and 2014 editions) design spectrum provided in Appendix H-1, Figure 15. The spectral accelerations for the MCE random crustal earthquake exceed the design spectrum over the period range of 0.11 to 0.45 second using the 2010 OSSC. The spectral accelerations for the MCE random crustal earthquake exceed the design spectrum over the period range 0.10 to 0.47 second using the 2014 OSSC. As part of final design studies, additional borings would be completed to investigate subsurface conditions. The preliminary borings indicate that subsurface materials generally consist of loose to very dense sandy silt to silty sand. General site topography is gently sloping without steeper slopes. Based on site topography and preliminary boring information, it is anticipated that no amplification of ground motions will occur and that the design ground motions will not be greater than those of the MCE ground motions.

(v) An assessment of seismic hazards expected to result from reasonably probable seismic events. As used in this rule, "seismic hazard" includes ground shaking, ground failure, landslide, lateral spreading, liquefaction, tsunami inundation, fault displacement and subsidence.

Response: Based on the preliminary geotechnical studies, no significant seismic hazards are expected at the Carty Solar Farm. The predominant foundation conditions include loose to dense cemented silt/fine sand underlain by weathered rock, which in turn is underlain by hard basalt. There are also medium stiff to very stiff clayey silt layers in several of the borings. These conditions should provide adequate bearing strata for the project foundations, and the predominantly dense and stiff overburden soils are not be expected to liquefy, spread laterally, or significantly amplify ground motions from a seismic event.

Due to the gently sloping topography of the site, the likelihood of seismically induced landsliding is low. Additionally, the site is not located near a body of water large enough to develop a significant tsunami wave. Therefore, the risk of tsunami inundation at the site is extremely low to non-existent. Any earthquake-induced waves (seiche) from the impoundment reservoir would not be expected to exceed the height of the embankments or to travel very far landward of the shorelines. There are no mapped active crustal faults located within 6 miles of the site. The risk of fault rupture is low.

H.8 NON-SEISMIC GEOLOGIC HAZARDS

OAR 345-021-0010(1)(h)(G) *An assessment of soil-related hazards such as landslides, flooding and erosion which could, in the absence of a seismic event, adversely affect or be aggravated by the construction or operation of the facility.*

Response: Based on the preliminary geotechnical investigations, the Carty Solar Farm does not appear to possess any significant, non-seismic geologic hazards. As discussed in Appendix H-1, there is an upper surficial layer of dry silt/fine sand that may present minor geotechnical concerns relating to wind erosion or soil-structure collapse; however, it is anticipated that these concerns can be mitigated during the final design and construction phases of the project. In general, the near-surface soil conditions across the site are similar, with loose to medium dense silty sand to sandy silt with weak caliche cementation throughout the layer in the upper 18 to 28 feet. All borings encountered slightly looser soils in approximately the upper 5 feet. These near surface soil units generally increase in relative density with increasing depth. Underlying these upper soil units are very dense silt and sand, medium stiff to very stiff clayey silt, dense to very dense basalt fragments in a soil matrix, and medium hard to hard basalt. These conditions should provide adequate bearing strata for project foundations.

The risk of landslide occurrence at the site is very low due to: (1) gently sloping topography (relatively flat terrain); (2) relatively strong soils at depth; and (3) apparent low groundwater levels. In addition, the risk of flood damage is low due to the flat terrain and lack of upslope drainage areas that could direct water into the project site. Based on the geologic reconnaissance, there were no indications of any significant surficial flood drainage ways or flood-eroded ravines, other than Sixmile Canyon.

The two key geotechnical and geologic issues for the Carty Solar Farm appear to be the potential for erosion of loose surficial soils and a low potential for collapse of the relatively loose, near-surface, wind-blown soils. It is anticipated that the final design exploration program would include additional borings, or possibly test pits, to evaluate the areal extent of the loose silt/fine sand layers. Potential mitigation measures for the collapse of loose silt/fine sand layers are discussed in Section H.10.

Soil erosion typically results from the uncontrolled flow of surface water across a site or from strong winds acting on loose silty or sandy soils. Due to the relatively flat topography at the site, surface erosion from water flow is considered unlikely. The soils at the ground surface have a low to moderate susceptibility to wind erosion. Mitigation measures for soil erosion are discussed in Section H.10.

H.9 SEISMIC HAZARD MITIGATION

OAR 345-021-0010(1)(h)(H) *An explanation of how the applicant will design, engineer and construct the facility to avoid dangers to human safety from the seismic hazards identified in OAR 345-021-0010(1)(h)(F). The applicant shall include proposed design and engineering features, applicable construction codes, and any monitoring for seismic hazards.*

Response: Ground-shaking hazards would be addressed by the use of seismic ground response spectra in the design, in general accordance with applicable IBC and OSSC requirements for design of project structural support elements to avoid failure of the panel support systems. The structural engineer would design the facilities to resist lateral base shear based on the spectral values and the seismic design category of the structure. If the spectral values are significantly lower than the OSSC values, the code values would be utilized.

In addition, the unlikely event of a failure of a solar panel support system (i.e., the racking support system for the solar panels) would pose an extremely low risk to human safety, as the possibility of operational staff being present on site during a significant seismic event is considered to be remote.

H.10 NON-SEISMIC HAZARD MITIGATION

OAR 345-021-0010(1)(h)(I) *An explanation of how the applicant will design, engineer and construct the facility to adequately avoid dangers to human safety presented by the hazards identified in OAR 345-021-0010(1)(h)(G).*

Response: As discussed in Section H.8 of this exhibit, siting the facility at the proposed location does not appear to pose significant geotechnical or geological design issues. The key issue appears to be the potential for surface soil erosion due to wind and/or collapse of the near-surface layers of loose, dry silt and sand.

The potential for surface wind erosion will be addressed in the final design with some form of vegetation or ground surface treatment to bind the surface soil particles together or to cover them with a wind-resistant layer, such as a crushed rock aggregate. The potential problem of soil structure collapse is simple to address in the design phase, with considerations given to: (1) extending foundation supports for the Carty Solar Farm solar panel support systems and other appurtenant structures through the looser soil to stronger bearing layers at a slightly lower depth; and/or (2) excavating and replacing the looser soil with engineered fill that is moisture conditioned and placed and compacted in lifts. Extending the foundation supports of the panel support systems to a deeper, more competent soil layer may be best for the racking support systems, whereas the latter option of excavation and replacement may be better suited under the electrical equipment concrete support slabs and paved road sections.

Again, these potential geotechnical or geological hazard issues are not considered to be a danger to human safety and could be easily mitigated during the final design of project features. There is no need to develop any mitigation measures relating to landslides or flooding, as these geologic hazards are not considered to be an issue for this site.

H.11 REFERENCES

Abrahamson, N. A., Silva, W. J., and Kamai, R. 2014. "Summary of the ASK14 ground motion relation for active crustal regions." *Earthquake Spectra 30*, 1025–1055.

Addo, Kofi, Abrahamson, Norman, and Youngs, Robert. 2012. "Probabilistic seismic hazard analysis (PSHA) model—Ground motion characterization (GMC) model," Report E658, published by BC Hydro.

Atkinson, G.M. and Boore, D.M. 2003. "Empirical ground-motion relations for subduction zone earthquakes and their application to Cascadia and other regions," *Bulletin of the Seismological Society of America*, Vol. 93, 1703–-1729.

Atkinson, G.M., and Macias, M. 2009. Predicted ground motions for great interface earthquakes in the Cascadia subduction zone: *Bulletin of the Seismological Society of America*, Vol. 99, 1552–1578.

Boore, D. M., Stewart, J.P., Seyhan, E., and Atkinson, G.M. 2014. "NGA-West2 equations for predicting PGA, PGV, and 5% damped PSA for shallow crustal earthquakes." *Earthquake Spectra 30*, 1057–1085.

Campbell, K.W., and Bozorgnia, Y. 2014. "NGA-West2 ground motion model for the average horizontal components of PGA, PGV, and 5% damped linear acceleration response spectra." *Earthquake Spectra 30*, 1087–1115.

Chiou, B.S.-J., and Youngs, R.R. 2014. Update of the Chiou and Youngs "NGA model for the average horizontal component of peak ground motion and response spectra." *Earthquake Spectra 30*, 1117–1153.

Idriss, I.M. 2014. "An NGA-West2 empirical model for estimating the horizontal spectral values generated by shallow crustal earthquakes." *Earthquake Spectra 30*, 1155–1177.

United States Geological Survey. 2018. Online Searchable Earthquake Catalog. Available at: https://earthquake.usgs.gov/earthquakes/search/. Accessed January 27, 2018.

Zhao, J.X., Zhang, J., Asano, A., Ohno, Y., Oouchi, T., Takahashi, T., Ogawa, H., Irikura, K., Thio, H., Somerville, P., Fukushima, Y., and Fukushima, Y. 2006. "Attenuation relations of strong ground motion in Japan using site classification based on predominant period." *Bulletin of the Seismological Society of America*, Vol. 96, 898–913.

Appendix H-1

Preliminary Geotechnical/Geological Investigations – Carty Solar Farm

Note: Appendix H-1 Geotechnical/Geological Investigations for the Photovoltaic Solar Facility was prepared for the previous draft of this RFA, submitted to the Oregon Energy Facility Siting Council in August 2016. Since that submittal, PGE has modified its plans for the project. References to Units 2 and 3 are included in Appendix H-1 Figure 2, but are no longer relevant to PGE's amendment request and is therefore not incorporated into the evaluation of compliance with applicable Council standards.

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Preliminary Geotechnical/Geological Investigations
Carty Generating Station – Photovoltaic (PV) Solar Facility Project
Boardman, Oregon

Dear Mr. Boyd:

In accordance with our proposal, we have completed a preliminary geotechnical/geological investigation for a proposed Carty Generating Station – Solar Facility Project near Boardman, Oregon. This letter-report summarizes our field investigations, laboratory testing, and our geotechnical and geological assessments of the proposed project site.

Background Information

General Description. Portland General Electric (PGE) is proposing to build a solar panel facility near its existing Carty Power Generation Facilities in north central Oregon. The Carty Solar Facility Site would be approximately 8,000 feet southeast of the existing Boardman Plant. It will be located on approximately 430 acres of undeveloped, open range land immediately adjacent to the Carty Reservoir in Morrow County, Oregon (see Vicinity Map, Figure 1). It will be adjacent to or surround the existing ash waste landfill site that is currently in-use for the Boardman (coal-fired) Plant. Figure 2 shows an aerial plan view of the Boardman-Carty Complex with many of the prominent site and plant features shown, as well as the relative location of the proposed solar facility site.

The proposed solar facility project will be capable of generating approximately 40-50 MW of power, adding to the existing capacity of the Boardman and Carty Plants. All solar panels will be mounted on a yet-to-be-determined racking system elevated above the ground surface. The foundation support systems for the panel racks are unknown at this time as are the final design loads. Design loads for similar facilities have depended on the various types of racking systems used for the projects. Allowable design loads for different types of racking systems have typically ranged from 5,000 to 10,000 pounds for maximum axial and lateral loads. Other electrical equipment associated with the project will generally be supported by slab-on-grade

concrete pads. The electrical equipment and concrete slabs typically weigh approximately 50,000 pounds, and generally have an average footprint of 200 square feet. Foundation support for these electrical pads will be by direct bearing on the ground surface, shallow spread footing or possibly drilled piers; the final design being dependent on subsurface soil conditions. The electrical equipment and support pads will be arranged across the solar facility site, as needed.

The focus of these site investigations for the solar facility site is to provide a preliminary assessment of the foundation conditions and potential geotechnical/geological hazards at the proposed location. The information developed by these investigations will help satisfy the requirements of Exhibit H, a subsection on soils and geology that will be included in a Site Certificate Amendment Request to the Oregon Department of Energy's – Energy Facility Siting Council. Additional field investigations, laboratory testing, and geotechnical design analyses specific to the final solar facility layout and panel support system will be performed later in the project development.

Geotechnical Performance of Existing Boardman Plant. Based on discussions with PGE personnel, it is our understanding that the existing Boardman Generating Plant has not experienced any geotechnical- or geological-related issues since its construction in the late 1970's. Most of the structures are founded on deep foundations (drilled shafts), which penetrate into cemented soils and basalt bedrock underlying the site. There have been no problems associated with soil collapse, ground surface heave, settlement, landslide movement and no damages from minor seismic events that have occurred during the life span of the existing facility.

Scope of Work

The preliminary geotechnical assessment for the solar facility project included the following work tasks:

- Review existing site information on the geologic setting, potential seismic sources, and other geologic hazards that could have an impact on the design and performance of the proposed project structures.
- Complete a geological field reconnaissance of the proposed site to check for and document geologic hazards.
- Perform a preliminary subsurface exploration program consisting of four borings at locations identified by another consultant and staked in the field by PGE's survey crew. The borings are shown on a Solar Facility Site Plan, Figure 3. The drilling program also included piezometer installations at each of the four drillhole locations to monitor groundwater conditions across the site.
- A second field investigation task included a field electrical resistivity test site (Wenner 4-pin test) at one location in the northeast portion of the site, see Figure 3.

- Perform a laboratory testing program that included: i) moisture contents on all soil samples collected; ii) Atterberg limits; iii) grain-size analyses; iv) consolidation tests; v) collapse potential tests; vi) soil pH tests; vii) sulfate and chloride content tests; and viii) laboratory electrical resistivity tests, all on representative samples collected from the borings.
- Prepare a preliminary geotechnical/geological report summarizing: i) the assessments of existing geologic and seismic information relevant to the project; ii) the geologic field reconnaissance; iii) the site investigations and subsurface conditions; iv) laboratory testing results; v) preliminary geotechnical recommendations relating to foundation design; and vi) an overview of geological/geotechnical issues with regard to design and construction of the proposed facilities.
- Preparation of Exhibit H – Geology and Seismicity, Subsections A through I for a Site Certificate Amendment Request, in accordance with the Oregon Administrative Rules OAR 345-021. It is understood that the overall Site Certificate Amendment will be prepared by PGE, with input from our firm as required for Exhibit H. Our Exhibit H subsection will be submitted to PGE as a stand-alone document under a separate cover.

Geologic Setting

The proposed site is located on Poverty Ridge, approximately 12 miles southwest of Boardman, Oregon, within the Deschutes-Columbia Plateau physiographic province. The Deschutes-Columbia Plateau is predominantly a volcanic area covering about 63,000 square miles in Oregon, Washington, and Idaho and contains the widespread flows of the Columbia River Basalt Group. At the proposed site, the native terrain is gently sloping downhill to the north toward the Columbia River at ½ to 1½ degrees (Figure 1). This sloping terrain is interrupted occasionally by geologic folds, one of which is Poverty Ridge.

The topography of the Carty-Boardman Complex area is dominated by Poverty Ridge and Sixmile Canyon directly to the west. At this site, the ridge elevation is approximately 690 to 750 feet and the floor of Sixmile Canyon is 670 feet just west of the proposed site. The ridge surface is generally flat with an approximate elevation decrease of 10 feet per 1,000 feet toward the Columbia River. Adjacent to the site, Sixmile Canyon more closely resembles a narrow valley as the canyon diminishes from deeper northern portions toward the south. Surface water currently infiltrates into the soil or flows west towards Sixmile Canyon. One arm of the Carty Reservoir currently occupies and infills a portion of Sixmile Canyon directly west of the solar facility site.

Cataclysmic floods repeatedly swept through this area at the end of the last ice age, or about 13,000 to 15,000 years ago. These floods, termed the Missoula Floods, were the result of glacial damming of over 500 cubic miles of water in western Montana. As the water backed-up behind ice dams, the dams would eventually float and break free of their foundation, releasing the volume of glacial Lake Missoula at velocities up to 80 mph. Approximately twenty-five of these floods transported and deposited significant quantities of sediment and shaped the current landscape of the region, including the proposed solar facility site. The threat of future floods was

eliminated with the retreat of the ice sheets 13,000 years ago. The flood deposits at the site are evidenced by rock types foreign to the area, such as granite, schist, and gneiss that were transported to the site on ice rafts during the floods.

Mapped approximately 1½ miles northeast of the site is an inferred, concealed northwest-trending normal fault (Smith and Roe, 2015). This fault does not appear in the USGS databases for faults displaying known Quaternary displacement. The closest reported fault that may exhibit quaternary activity is approximately 17 miles to the west and is part of the Arlington-Shutler Butte fault zone. Three other possible Quaternary fault systems are present approximately 50 miles to the east of the site: the Wallula fault system, the Ukiah Valley faults, and the Hite fault system.

Borings located in the southern part of the site, drilled to depths of 50 feet, encountered similar overburden profiles consisting of loose to very dense sandy silt and silty sand displaying varying degrees of caliche cementation. These deposits are typical of the local loess deposits associated with dune field sedimentation and Missoula Flood deposits. These borings also encountered preserved veins of caliche sedimentation and occasional basaltic rock fragments. One of the borings (B-2), discussed fully in a subsequent section, encountered a medium hard to hard basalt at 43 feet below the ground surface (bgs). In the northerly borings, subsurface materials were similar to the southern borings, except for encountering an interlayer of medium stiff to very stiff clayey silt overlying the basalt bedrock. Boring B-4 encountered medium hard to hard basalt at 38 feet bgs.

The geologic formations underlying the overburden soil units at the proposed solar facility site are associated with the Columbia River Basalt Group and are interpreted to consist of the Elephant Mountain Flow (10.5 million years old). This basalt typically consists of very highly jointed, hard basalt in a matrix of slightly clayey to clayey silt in the upper 10 feet of the unit, grading to less-fractured hard basalt. The unit is generally 20 to 30 feet in thickness according to borings at the nearby Boardman Generating Station. From previous explorations at the Boardman Station, the unit is a hard to very hard, gray, fine- to medium-grained basalt.

The Rattlesnake Ridge unit underlies the Elephant Mountain flow and is generally 20 to 35 feet in thickness beneath the Boardman Station. It consists of weakly cemented, weathered tuff and tuffaceous sediments. This unit is altered to the extent that it exhibits soil-like engineering characteristics as a very stiff to hard, clayey silt.

The Pomona basalt flow underlies the Rattlesnake Ridge unit and consists of three distinct portions: an upper breccia zone, a middle vesicular zone, and a bottom dense basalt zone. When encountered beneath the Boardman Station, the breccia zone consists of vesicular to scoriaceous basalt fragments within a tuffaceous matrix. This unit has not been fully penetrated by any drilling at the Boardman Station. A geologic map from Oregon Geologic Data Compilation Release 6 (OGDC-6) showing the surficial geologic units at the site is shown on Figure 4.

Geologic Reconnaissance

A senior engineering geologist from our firm performed a geologic reconnaissance of the proposed Carty Area Expansion Site for the solar facility on March 30, 2016. The reconnaissance entailed examining published maps, aerial photos, and walking the site in the location of the planned facilities. Due to the site's straightforward conditions and setting (i.e. consistent gently sloping to level ground with silt and sand over bedrock), a site specific geologic map was deemed unnecessary. The reconnaissance confirmed the geology previously mapped in the area from both publicly and privately available geologic information. The units in the area are as described above.

There is an unnamed inferred/concealed fault located about 1½-miles northeast of the proposed solar facility site. A reconnaissance of this fault did not reveal any evidence of displacement of surficial deposits.

Surficial soils in the area of the solar facility site consist predominantly of up to 28 feet of light brown, cohesionless, wind-blown silt and fine sand (loess). The sand is loose and well drained. It's dry at the surface and, at the time of the site visit, becomes slightly moist at about 6-inches. Sparsely vegetated and stabilized longitudinal sand dunes aligned parallel to the northeast prevailing wind direction dominate the topography. The stabilizing vegetation consists of desert grasses, sagebrush, and scattered trees. Where vegetation is bare the dune sand is subject to accelerated erosion; wind erosion has created numerous scouring depressions in the silt/sand deposits and minor sediment transport was seen to be occurring at the time of the reconnaissance. The dune morphology has a relative relief of 3 to 4 feet in height and 6 to 8 feet across on the average. Numerous cobble- to boulder-sized lithics were observed scattered across the site, evidence of the Missoula Floods. Rock types included basalt, granite, and schist. The reservoir pool of the Carty Reservoir (see Figure 2) is cutting into these deposits, causing erosion and bank instability in some areas.

The surficial soils and the topography were observed to change slightly in the northern part of the proposed solar facility area. Near the reservoir, there is a zone that varies between 500 to 1,000 feet wide along the reservoir where soil moisture increases and the soil becomes slightly finer due to the reservoir influencing soil moisture and vegetation growth. In addition, the land surface is less irregular.

Geotechnical Explorations

Exploratory Borings. Field geotechnical investigations for the solar facility site consisted of exploratory borings and field electrical resistivity measurements at select locations. Four geotechnical borings were completed for this preliminary investigation at locations pre-staked by PGE, as shown on the Solar Facility Site Plan, Figure 3. The borings were pre-located and identified by another PGE consultant at locations scattered across the site to develop a general sense of the subsurface conditions present beneath the site.

The borings were drilled between March 29 to 31, 2016 by Cascade Drilling, LP of Clackamas, Oregon, using a track-mounted CME 85 drill rig. Drillholes were advanced using mud rotary and HQ3 wireline rock coring techniques. Standard Penetration Tests (SPT) samples were collected in the overburden soils at 2½-foot intervals to a depth of 20 feet, and at 5-foot intervals from that depth to the bottom of the hole, or until encountering bedrock. Additional samples were also collected at various depth intervals using a Pitcher-barrel sampler and a larger diameter drive sampler (Dames & Moore sampler) to collect representative samples of stiffer materials in all of the borings.

Two of the borings (B-1 and B-3) were drilled to 50-foot depths without encountering a bedrock contact. The other two borings (B-2 and B-4) each encountered rock at similar depths, and the lower samples collected in each consisted of short lengths of HQ3 rock cores. Both of these borings were also drilled to 50-foot total depths. Details of the soil and rock layers encountered, the sampling depths, SPT blow-count data, and information on the groundwater piezometer instrumentation are presented on Summary Boring Logs, Figures 5 through 8. A geologist from Cornforth Consultants was present at the site during all of the drilling work to coordinate the drilling operations, log soil and rock conditions, collect samples, and assist with the piezometer installations.

Groundwater Piezometers. Standpipe piezometers wells were installed in each of the borings. Each piezometer consisted of a ¾-inch nominal diameter 5-foot long PVC screen, with a ¾-inch PVC riser pipe. The screen section of the piezometer was surrounded by fine- to medium-sized silica sand, with the remaining annular space below and above the sand section backfilled with bentonite clay chips from the bottom of the hole to the ground surface. Each piezometer was finished with a flush-mount monument set in concrete at the ground surface. Details of the piezometer installation are shown on the Summary Boring Logs, Figures 5 through 8.

Electrical Resistivity Testing. Field resistivity measurements were collected at one location in the northeast portion of the site as shown on the Solar Facility Site Plan, Figure 3. The measurements were collected by a geophysical subconsultant firm, Earth Dynamics LLC on April 8, 2016. The resistivity measurements were obtained using a Wenner four-electrode procedure in general accordance with ASTM G 57-95a (2012). The testing procedures and measurement results are summarized in a letter report prepared by Earth Dynamics, which has been included in Appendix A of this report.

Laboratory Testing

Samples retrieved from the borings were re-examined in the laboratory to confirm field descriptions and laboratory tests were completed to develop soil index and engineering design properties.

Natural Moisture Content. The natural moisture content of all samples was determined in general accordance with ASTM D2216-10 test procedures. The results of the visual

classification and moisture content testing have been included on the Summary Boring Logs, Figures 5 through 8.

Atterberg Limits. Representative samples were also selected to determine Atterberg plasticity limits. The tests were performed on samples collected from the overburden soil to classify the plasticity of the fine-grained materials. The tests were performed in general accordance with ASTM D4318-10. The results are tabulated on Table 1 below and plotted on Figure 9.

Table 1 – Summary of Soil Index Testing

Boring No.	Sample No.	Depth (ft)	Natural Moisture Content (%)	Density [Dry Unit Weight] (pcf)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
B-1	S-4	10-13	12	114	--	--	NP
B-2	S-9	20-23	16	100	34	21	13
B-3	S-5	15-18	13	108	28	20	8
B-4	S-2	5-8	15	92	--	--	NP

Particle-size Gradation Analysis. Gradation tests were completed on four representative samples obtained from the overburden soil. The tests were performed in general accordance with ASTM D422-63(2007). Test results are plotted on Figure 10.

Density (Unit Weight). Representative samples were selected from the exploration program and tested for in-place density in general accordance with ASTM D7263-09. Density values were determined from consolidation tests, potential collapsibility tests, and density-only testing. The results of the density determinations are summarized in Table 1 and on Figures 11 through 14.

One-Dimension Consolidation. One consolidation test was performed on a portion of Boring B-1, Sample S-4 collected from a depth of approximately 10 to 13 feet. A second test was completed on Boring B-2, Sample S-9 collected from a depth of 20 to 23 feet. A third test was performed on Boring B-4, Sample S-2 collected from a depth of 5 to 8 feet. The tests were conducted in general accordance with ASTM D2435-11 test procedures. The results of the consolidation testing are presented graphically on Figures 11, 12 and 14.

Soil Collapsibility Potential. Three collapsibility tests were conducted on samples recovered from the borings to estimate the collapse potential for the near surface wind-blown silt/sand (loess) materials. Testing was conducted in general accordance with ASTM D4546-14. The results of the testing are tabulated below in Table 2 and plotted graphically on Figures 12 through 14.

Table 2 – Collapsibility Test Results

Boring No.	Sample No.	Depth (ft)	Inundation Load (tsf)	Collapse Potential (Ic)
B-2	S-9	20-23	0.5	0.1%
B-3	S-5	15-18	2	1.3 %
B-4	S-2	5-8	1	0.4 %

Corrosivity Tests. Corrosivity testing was completed on two representative samples collected from the exploratory borings. The test samples consisted of combined samples (combined to obtain sufficient materials for testing) from Borings B-1and B-3. The corrosivity testing and testing procedures (identified in parentheses) consisted of soil pH (ASTM G51), sulfate content (ASTM D4327) and chloride content (ASTM D4327). The results of the corrosivity testing are tabulated in Table 3 below. The tests were performed by Cooper Testing Labs of Palo Alto, California.

Table 3 – Summary of Corrosivity Testing

Boring No.	Sample No.	Depth (ft)	Natural Moisture Content (%)	pH	Sulfate Content (mg/kg)	Chloride Content (mg/kg)
B-1	S-2 / S-3	5 – 9	10	8.3	114	20
B-3	S-1 / S-2	2½ - 6½	17	8.4	141	3

Laboratory Electrical Resistivity Testing. In addition to the field resistivity testing summarized in an earlier subsection, laboratory electrical resistivity testing was completed on two representative samples selected from the borings. The samples tested included Boring B-1, Sample S-7 collected from a depth of 15 to 16½ feet, and Boring B-3, Sample S-4 collected from a depth of 12½ to 14 feet. A letter report prepared by Earth Dynamics LLC summarizing the laboratory resistivity testing procedures and results is included in Appendix B of this report.

Subsurface Conditions

Overburden materials consisted of three sedimentary units: wind-blown silt and fine sand (loess), sandy silt and silty sand with small rock fragments, and clayey silt (The Dalles Formation). The upper loess materials generally consisted of loose to medium dense, fine sandy silt to silty sand; cemented to varying degrees with weak caliche (calcium carbonate) cementation throughout the layer, and with occasional to numerous distinct veins of caliche. These loess deposits range in thickness from approximately 18 to 28 feet below the ground surface in the four borings.

In two of the borings (B-1 and B-2) the soils directly below the caliche loess consisted of very dense, sandy silt to silty sand with occasional angular rock fragments varying from ¼- to ¾-inch in diameter. This layer varied from 33 feet thickness in B-1 (hole terminated within this soil

layer) to 15 feet thickness in B-2. Boring B-2 terminated in slightly weathered basalt bedrock in the lower 7 feet of the boring. Boring B-1 did not encounter bedrock conditions within the drilled depth of the boring.

In Borings B-3 and B-4 the soil layer directly below the caliche loess consisted of medium stiff to very stiff, slightly clayey to clayey silt (10 feet thickness in B-3 and 15 feet in B-4). This soil unit is identified as a portion of The Dalles Formation that is known to be present in the project area. Dense to very dense, highly weathered, basalt fragments in a soil matrix underlies the clayey silt layer in B-3, and extends from this contact to the bottom of the drilled depth of the boring. Very dense, highly weathered basalt fragments and slightly weathered basalt bedrock were encountered in B-4 below the clayey silt layer. Boring B-4 was terminated in basalt bedrock (lower 12 feet of boring).

The highly weathered rock fragment layers encountered in Borings B-3 and B-4 below the sedimentary soils form the upper part of the Elephant Mountain bedrock. The weathered basalt fragments generally consisted of angular, gravel-sized rock fragments in a matrix of silty sand. These weathered rock fragment layers range in thickness from approximately 5 feet (B-4) to approximately 13 feet (in B-3), the actual thickness in B-3 was not determined due to hole termination within this layer.

The bedrock encountered in B-2 and B-4 is a medium hard to hard (R3-R4), slightly weathered basalt identified as the Elephant Mountain Flow member of the Saddle Mountain Basalts in the Columbia River Basalt Group. It is generally very highly to highly jointed, with high sample recovery during drilling and a low rock quality designation (RQD) value (see Borings 2 and 4 on Figures 6 and 8, respectively). The depth from the ground surface of this basalt bedrock unit ranged from approximately 38 feet in Boring B-4 to 43 feet in Boring B-2.

Piezometers to measure groundwater levels in the soil formations were installed in all four borings. The groundwater levels measured a few days following the drilling operations are plotted on the Summary Boring Logs, Figures 5 through 8.

Site Seismicity

As described previously, there are no mapped faults beneath the proposed solar facility site. An inferred fault is mapped approximately 1½ miles to the northeast. The closest potentially active mapped fault is 17 miles away to the west, part of the Arlington-Shutler Butte fault zone. These faults do not appear in the USGS Quaternary fault database and no mapped historic earthquakes appear to be associated with the mapped locations, indicating a low likelihood of rupture on a known fault. There have been 61 reported earthquakes since 1975 within a 50 mile radius of the site with a minimum magnitude of 2.5, at a rate of just under 2 per year. The maximum recorded earthquake magnitude is 4.1, centered approximately 37.2 miles to the southwest near Condon, Oregon, which occurred in January 2000.

Two principal types of earthquake sources that are capable of generating ground motions at the site are the Cascadia Subduction Zone (CSZ) "interface" zone and local crustal faults. The CSZ results from the Juan de Fuca tectonic plate subducting (sliding) beneath the American continental tectonic plate. The CSZ interface events occur between the Juan de Fuca and North American plates. The crustal fault sources identified are those occurring on known, unknown, buried, or random faults. Table 4 identifies and characterizes the potential seismic sources capable of generating a peak bedrock acceleration of at least 0.05g at the site. Mean peak bedrock accelerations for crustal sources were calculated using the average of all five enhanced Next-Generation Attenuation-West 2 (NGA-West 2) relationships (Idriss, 2014; Campbell and Bozorgnia, 2014; Abrahamson and Silva, 2014; Boore and Atkinson, 2014 and Chiou and Youngs, 2014). The peak acceleration for the CSZ interface event was calculated using the averaged, mean plus one standard deviation ground motions from Addo, et al (2012), Atkinson and Boore (2003), Atkinson and Macias (2009), and Zhao, et al. (2006) attenuation relationships.

Table 4: Deterministic Seismic Hazard Assessment Peak Bedrock Acceleration >0.05g

Source	Probability of Activity	MCE	Minimum Distance (km)	Mean Peak Acceleration (g)
Horse Haven Hills Structure	1.0	7.1	65	0.06
Rattlesnake-Wallula Fault System	1.0	7.4	70	0.06
Mill Creek Thrust Fault	1.0	7.1	73	0.05
Random Event	1.0	6	10	0.24
Interface Event	1.0	9	310	0.05

MCE – Maximum Credible Earthquake

As shown in the table, the random crustal event would control ground motions at the site for potential seismic sources. Other crustal sources in eastern Oregon and Washington and the CSZ Interface Event are located too far from the site to produce peak bedrock accelerations much greater than 0.05g to 0.6g at the site.

The spectral accelerations for the MCE Random Crustal earthquake exceed the 2014 Oregon Structural Specialty Code (OSSC) design spectrum over the period range 0.10 to 0.47 seconds (see Figure 15). General site topography is gentle and without steep slopes. Based on site topography and the preliminary boring information discussed above, it is expected that amplification of ground motions are not expected to be greater than those of the Maximum Considered Earthquake ground motions. Additionally, earthquake induced landslides or liquefaction are not likely due to the gentle topography and the lack of high groundwater conditions in the overburden soils.

Mapped spectral accelerations at the site based on IBC 2015 (2,475-year return period, 0.2s SA and 1.0s SA) are 0.423g and 0.165g, for short (S_S) and 1-second (S_1) period motions, respectively. Based on preliminary subsurface explorations, the soil profile at the site corresponds to an IBC site class D. The risk-targeted maximum considered earthquake (MCE_R) ground motions at the site, S_{MS} and S_{M1} are 0.618g and 0.353g, respectively.

Preliminary Geotechnical Design Considerations

Siting the solar facility at the proposed location does not appear to pose significant geotechnical or geological design issues. In general, the subsurface soil conditions across the site are similar with loose to medium dense, silty sand to sandy silt with weak caliche cementation throughout the layer in the upper 18 to 28 feet. All borings encountered slightly looser soils in approximately the upper five feet. These near surface soil units generally increase in relative density with increasing depth, with the soils in Boring B-1 becoming dense from 11 to 28 feet. Underlying these upper soil units are very dense silt and sand, medium stiff to very stiff clayey silt, dense to very dense basalt fragments, and medium hard to hard basalt (refer to the Summary Boring Logs for details). These general soil conditions should provide an adequate bearing stratum for the project foundations, and the relatively stiff to dense overburden soils would not be expected to significantly amplify ground shaking from a seismic event.

Based on the finding from the preliminary borings and the geologic site reconnaissance, the key geotechnical and geologic issues for the solar facility project appear to be the potential for erosion of the looser surficial soils, and a somewhat low potential for collapse of the relatively loose, surficial wind-blown soils. Collapse is a phenomenon where the loose, dry, silt/fine sand soil structure consolidates upon saturation or additional loading, which can cause distress to overlying structural elements or road pavement sections due to differential settlement.

The potential for surface wind erosion will need to be addressed with some type of vegetation growth or treatment of the ground surface to bind the surface soil particles together. The problem of potential soil structure collapse is simple to address in the design phase, with considerations given to: (i) extending foundations support for the solar panel support system and other appurtenant structures through the looser soil to stronger bearing layers at a slightly lower depth, and/or (ii) excavating and replacing the looser soil with engineered fill that is moisture conditioned, and placed and compacted in lifts. The latter option of removal and replacement is better suited under any electrical equipment concrete support pads and any paved road sections.

Foundation support for the solar panel rack system could be either shallow spread footings, with bottom surfaces below about five feet depth; or on small diameter pin piles that could consist of driven steel pipe piles or auger-cast concrete piles. The depth of piling support would likely be in the 15- to 25-foot depth range in the general vicinity of Borings B-1 and B-2, increasing up to 25- to 35-foot depths in the general vicinity of Borings B-3 and B-4. The piles could develop load resistance from either end-bearing, skin friction or a combination of both. The foundation support systems and ground treatment measures for the project would be developed during final

project design when more details are known about the panel-support rack system, location of concrete equipment pads and access road surfaces.

Preliminary Geotechnical Recommendations

Based on the foregoing, we recommend that the final geotechnical design phase of the project include the following tasks:

- Drill additional borings at scattered locations across the site to further characterize the subsurface conditions, as well as collect information for foundation design. For planning purposes, we would anticipate boring depths to again be on the order of 50 feet to achieve 10 to 30 feet penetration into denser overburden soils or to encounter a bedrock contact.
- Complete a laboratory testing program to provide additional data on the soils for design studies. The laboratory data would be used to estimate collapse and settlement potential for any loose, compressible soil layers and to develop foundation soil index and shear strength parameters for design recommendations.
- Conduct geotechnical engineering studies and develop geotechnical recommendations for final design of foundation support systems, site grading, ground surface treatments and access road surfaces.
- Prepare a geotechnical design report summarizing the information outlined above.

We appreciate the opportunity to be of assistance on this preliminary phase of the project. If you have any questions, please contact Randy Hill at 503-452-1100.

Respectfully,

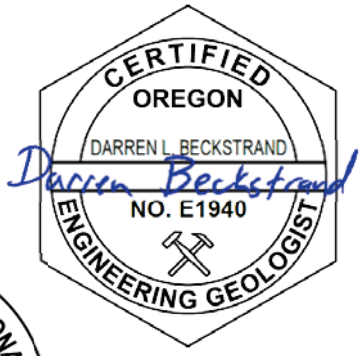
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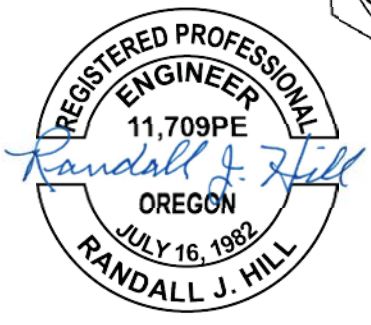
Darren Beckstrand

Darren L. Beckstrand, C.E.G.
Senior Associate Geologist

Randall J. Hill

Randall J. Hill, P.E.
Senior Associate Engineer





EXPIRES: 6/30/2017

References

Abrahamson, N. A., Silva, W. J., and Kamai, R., (2014). "Summary of the ASK14 ground motion relation for active crustal regions": *Earthquake Spectra 30*, 1025–1055.

Addo, Kofi, Abrahamson, Norman, and Youngs, Robert, (2012). "Probabilistic seismic hazard analysis (PSHA) model—Ground motion characterization (GMC) model": *Report E658*, published by BC Hydro.

Atkinson, G.M. and Boore, D.M. (2003). "Empirical ground-motion relations for subduction-zone earthquakes and their application to Cascadia and other regions," *Bulletin of the Seismological Society of America*, vol. 93, p. 1703-1729.

Atkinson, G.M., and Macias, M., (2009). "Predicted ground motions for great interface earthquakes in the Cascadia subduction zone": *Bulletin of the Seismological Society of America*, v. 99, p. 1,552–1,578.

Beeson, M.R. and Tolan, T.L., (1989), The Columbia River Basalt Group in the Cascade Range: A middle Miocene reference datum for structural analysis: in Muffler, L.J.P., Weaver, C.S. and Blackwell, D.D., eds., Workshop XLIV, Geological, geophysical, and tectonic setting of the Cascade Range; U. S. Geological Survey Open-File Report 89-178, pp. 257-290.

Boore, D. M., Stewart, J. P., Seyhan, E., and Atkinson, G. M., (2014). "NGA-West2 equations for predicting PGA, PGV, and 5% damped PSA for shallow crustal earthquakes": *Earthquake Spectra 30*, 1057–1085.

Campbell, K. W., and Bozorgnia, Y., (2014). "NGA-West2 ground motion model for the average horizontal components of PGA, PGV, and 5% damped linear acceleration response spectra": *Earthquake Spectra 30*, 1087–1115.

Chiou, B. S.-J., and Youngs, R. R., (2014). "Update of the Chiou and Youngs NGA model for the average horizontal component of peak ground motion and response spectra": *Earthquake Spectra 30*, 1117–1153.

Idriss, I. M., (2014). An NGA-West2 empirical model for estimating the horizontal spectral values generated by shallow crustal earthquakes, *Earthquake Spectra 30*, 1155–1177.

Personius, S.F. and Lidke, D.J., compilers, (2003), Fault number 580, Faults near The Dalles, in Quaternary fault and fold database of the United States, USGS.

Personius, S.F. and Lidke, D.J., compilers, (2003), Fault number 710, Ukiah Valley faults, in Quaternary fault and fold database of the United States, USGS.

Personius, S.F. and Lidke, D.J., compilers, (2003), Fault number 845d, Hite fault system, Agency section, in Quaternary fault and fold database of the United States, USGS.

Personius, S.F., and Lidke, D.J., compilers, (2003), Fault number 846, Wallula fault system, in Quaternary fault and fold database of the United States: USGS.

Personius, S.F., and Lidke, D.J., compilers, (2003), Fault number 847, Arlington-Shutler Butte fault, in Quaternary fault and fold database of the United States, USGS.

Shannon and Wilson, (1975), Geotechnical Investigation, Boardman Plant, Poverty Ridge Site, Morrow County, Oregon.

Smith, R. L. and Roe, W. P., (2015), Oregon Geologic Data Compilation Release 6 (OGDC-6), Oregon Department of Geology and Mineral Industries.

Zhao, J.X., Zhang, J., Asano, A., Ohno, Y., Oouchi, T., Takahashi, T., Ogawa, H., Irikura, K., Thio, H., Somerville, P., Fukushima, Y., and Fukushima, Y. (2006). “Attenuation relations of strong ground motion in Japan using site classification based on predominant period,” *Bulletin of the Seismological Soc. of America*, Vol. 96, 898-913.

Limitations in the Use and Interpretation of this Geotechnical Report

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the Owner in the design of the subject facility and should be made available to potential contractors and/or the Contractor for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive boring and test pit logs, cross-sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the exploratory borings, test pits, and/or probes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the exploratory borings and test pits, or assumed to exist in the excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

The Summary Boring Logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the borings progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The boring logs and related information depict subsurface conditions only at these specific locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the soil conditions at these boring locations.

Groundwater levels often vary seasonally. Groundwater levels reported on the boring logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, borings or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

This firm cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report; nor can our firm be responsible for any construction activity on sites other than the specific site referred to in this report.



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VICINITY MAP

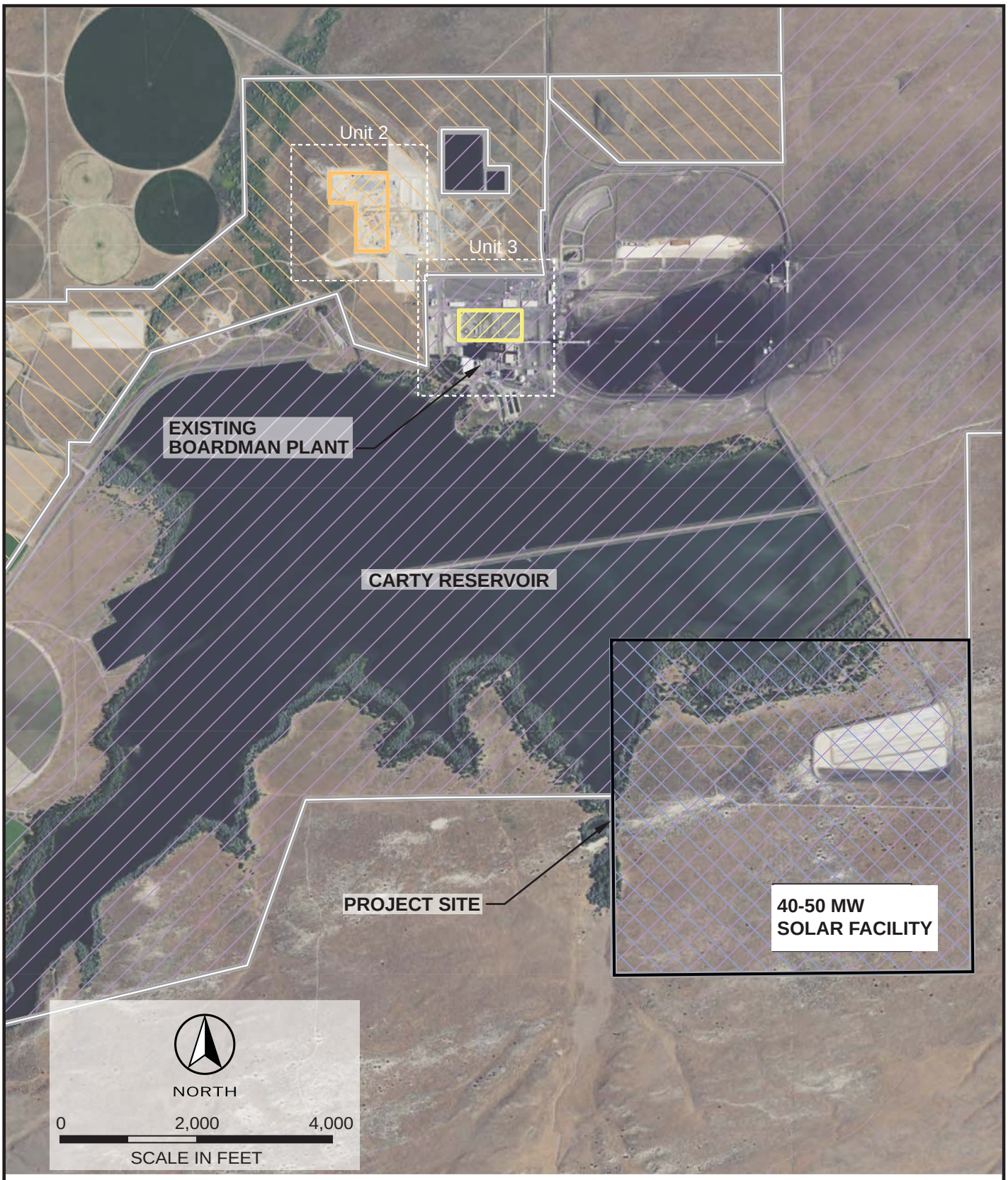
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FIG. 1

2488/01.AI



BASE IMAGE PROVIDED BY PORTLAND GENERAL ELECTRIC, 1/6/2016

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AERIAL PLAN

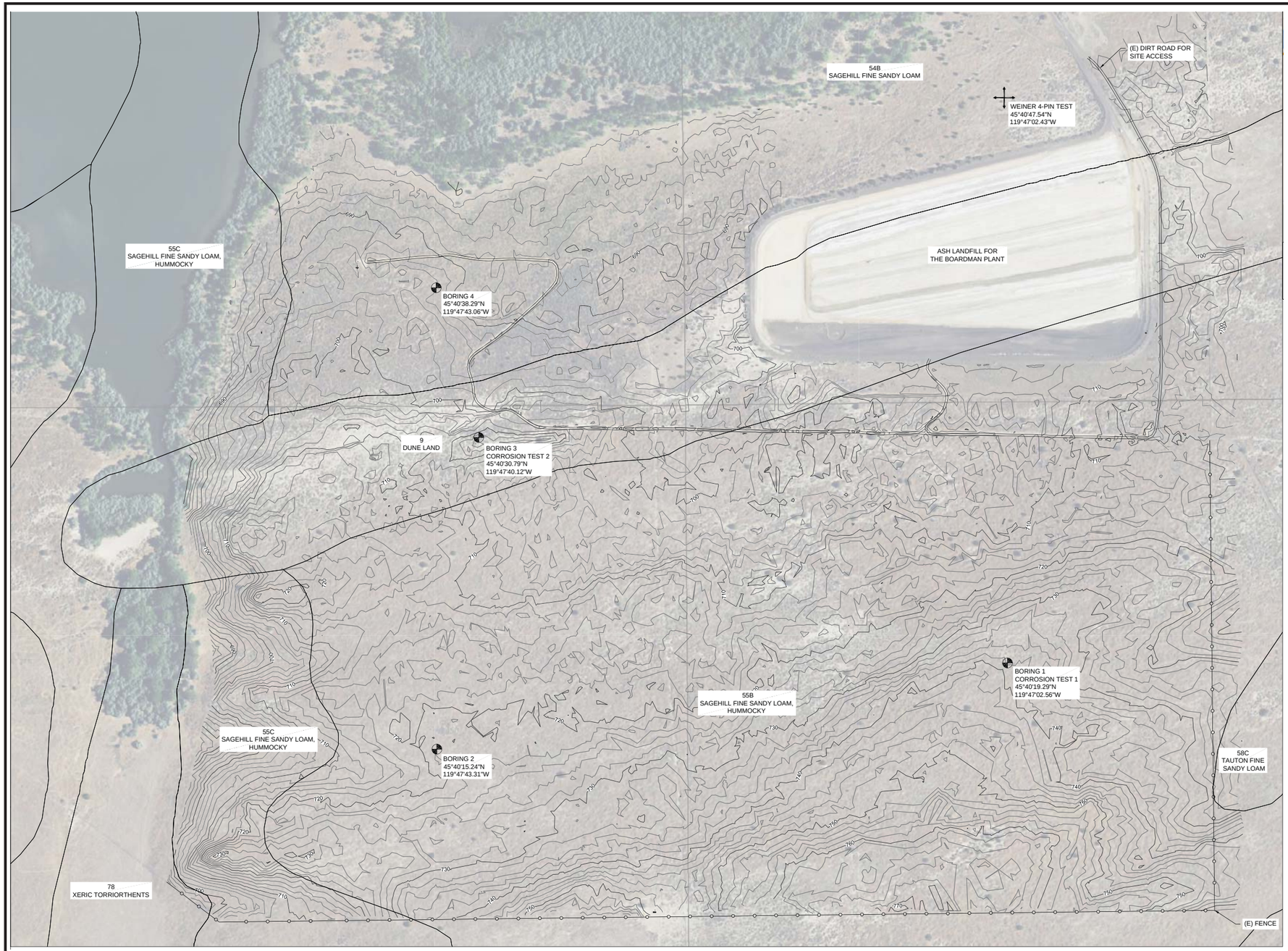
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FIG. 2

2488/02.AI



SURVEY NOTES:
1. SURVEY PERFORMED BY PORTLAND GENERAL ELECTRIC
2. HORIZONTAL BASIS: OREGON STATE PLANE, NORTH ZONE, NAD'83 (2011)
3. ELEVATION BASIS: NAVD 1988

BASE IMAGE PROVIDED BY PORTLAND GENERAL ELECTRIC, 2/22/2016

NORTH

NOT TO SCALE

LEGEND
BORING LOCATION
ELECTRICAL RESISTIVITY TESTING LOCATION
(E) MAJOR CONTOURS
(E) MINOR CONTOURS
(E) FENCE
(E) NRCS SOIL LAYERS

NRCS SOILS REPORT INFORMATION

MAP SYMBOL	MAP UNIT NAME	PRIME FARMLAND	HYDROLOGIC GROUP
9	DUNE LAND	NO	-
54B	SAGEHILL FINE SANDY LOAM, 2-5% SLOPES	YES IF IRRIGATED	B
55B	SAGEHILL FINE SANDY LOAM, HUMMOCKY, 2-5% SLOPES	YES IF IRRIGATED	B
55C	SAGEHILL FINE SANDY LOAM, HUMMOCKY,5-12% SLOPES	YES	B
58C	TAUNTON FINE SANDY LOAM, 5-12% SLOPES	YES	C
78	XERIC TORRIORTHENTS, NEARLY LEVEL	YES	A

2488/03.AI

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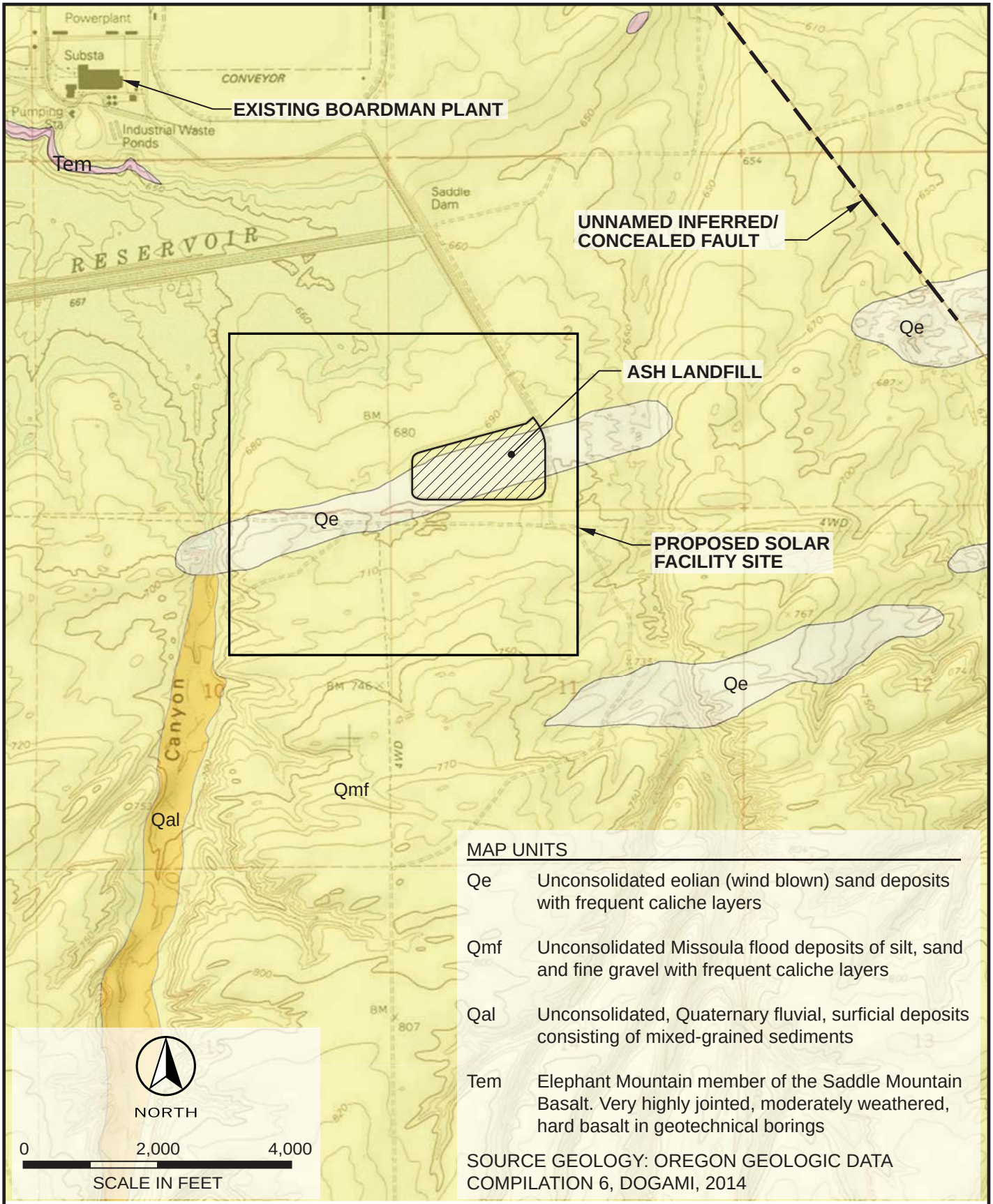
SOLAR FACILITY SITE PLAN

CARTY STATION - SOLAR FACILITY
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FIG. 3



MAP UNITS

Qe	Unconsolidated eolian (wind blown) sand deposits with frequent caliche layers
Qmf	Unconsolidated Missoula flood deposits of silt, sand and fine gravel with frequent caliche layers
Qal	Unconsolidated, Quaternary fluvial, surficial deposits consisting of mixed-grained sediments
Tem	Elephant Mountain member of the Saddle Mountain Basalt. Very highly jointed, moderately weathered, hard basalt in geotechnical borings

SOURCE GEOLOGY: OREGON GEOLOGIC DATA COMPILATION 6, DOGAMI, 2014

MAP CREATED USING ARC GIS ©2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED

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SITE GEOLOGIC MAP

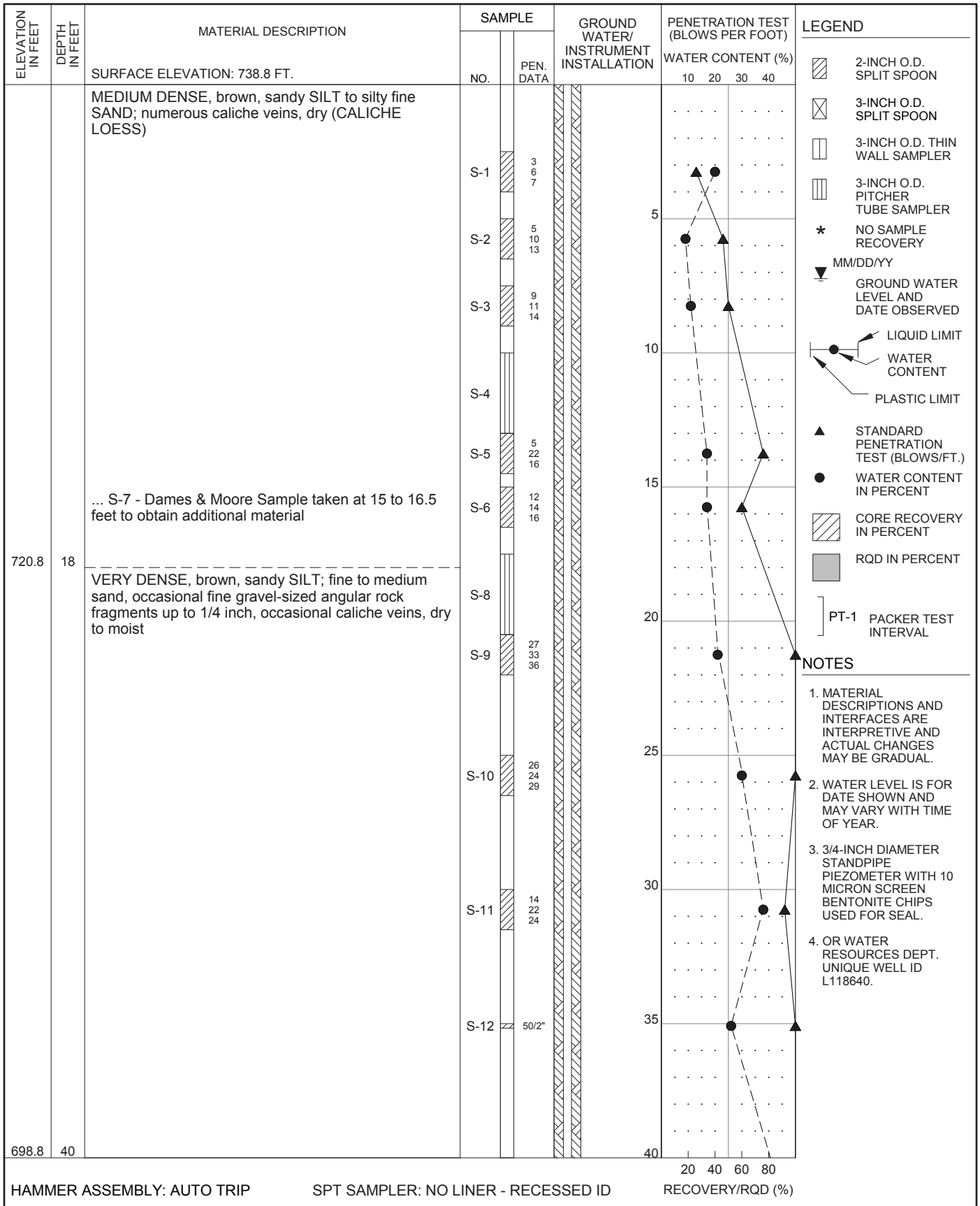
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FIG. 4

2488/04.AI



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BOREHOLE DIAM.: 5" 0 TO 50 FEET

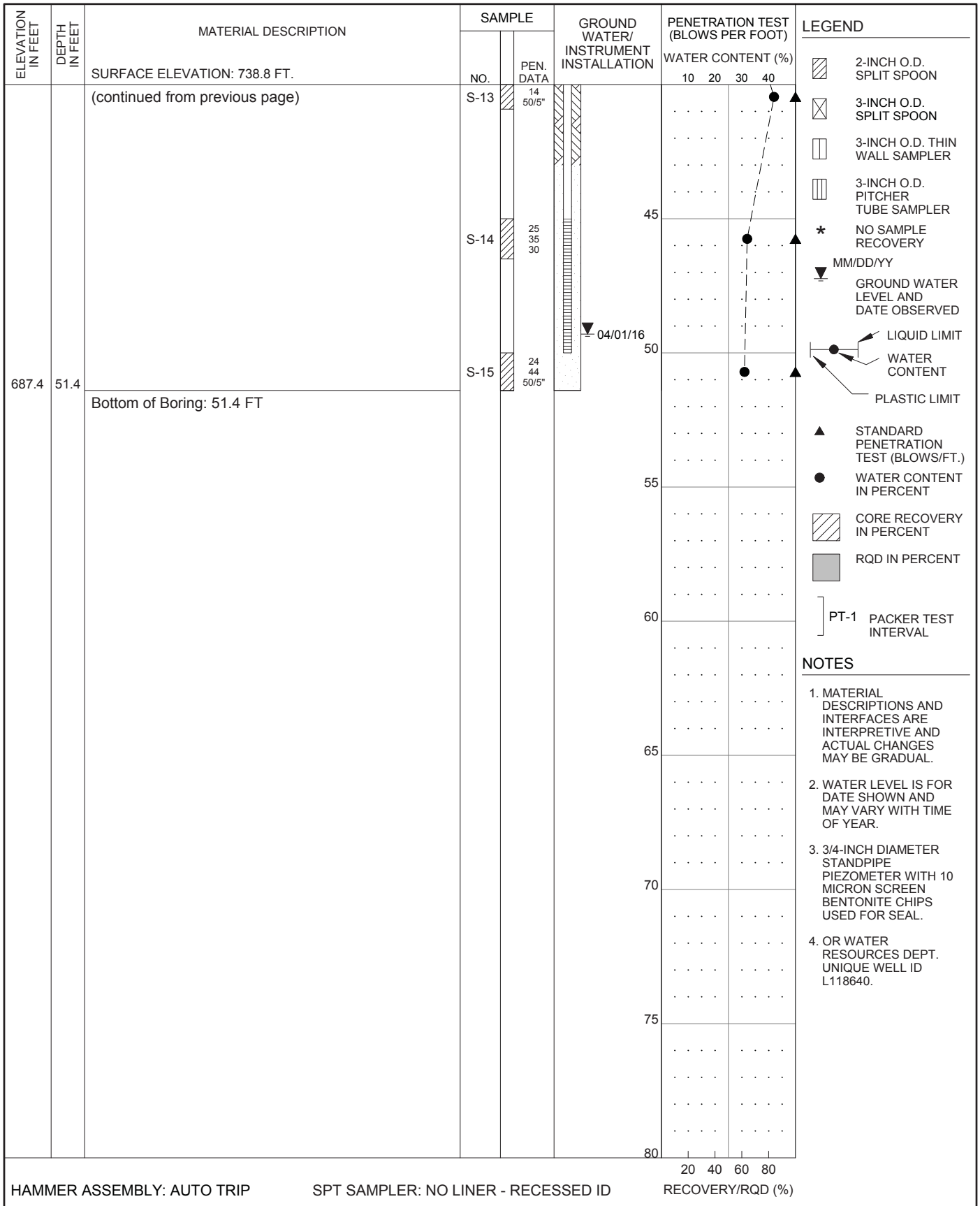
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SUMMARY BORING LOG B-1 (1 of 2)

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FIG. 5



HAMMER ASSEMBLY: AUTO TRIP
DRILL ROD USED: NWJ
SPT SAMPLER: NO LINER - RECESSED ID
BOREHOLE DIAM.: 5" 0 TO 50 FEET

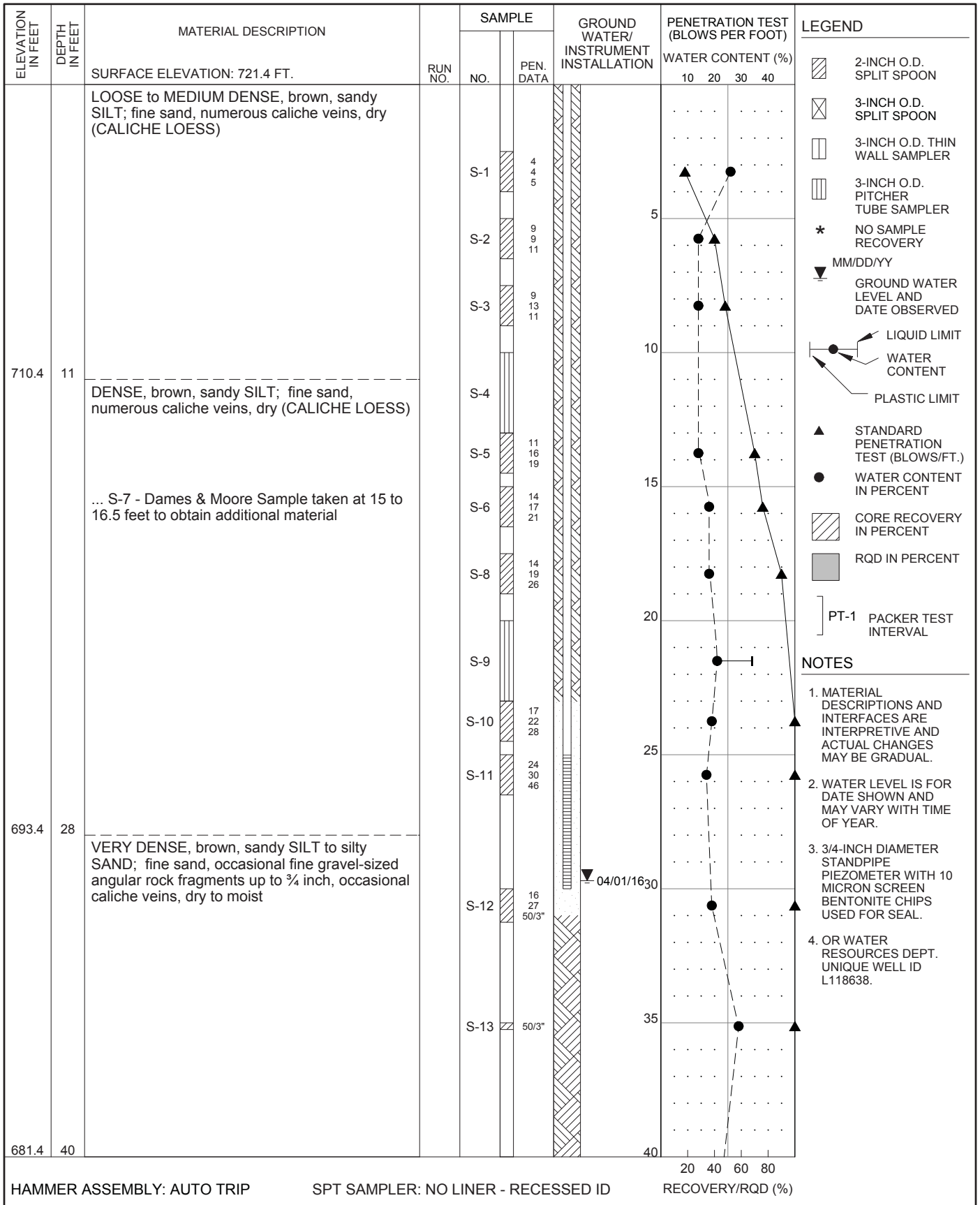
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SUMMARY BORING LOG B-1 (2 of 2)

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FIG. 5



HAMMER ASSEMBLY: AUTO TRIP
SPT SAMPLER: NO LINER - RECESSED ID
DRILL ROD USED: NWJ
BOREHOLE DIAM.: 5" 0 TO 43 FEET, 4" 43 TO 50 FEET

DRILLER: CASCADE DRILLING
DATE START: 3/30/2016 FINISH: 3/30/2016
DRILLING TECHNIQUE: MUD ROTARY / HQ3 CORING

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SUMMARY BORING LOG B-2 (1 of 2)

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FIG. 6

ELEVATION IN FEET	DEPTH IN FEET	MATERIAL DESCRIPTION	RUN NO.	SAMPLE NO.	SAMPLE PEN. DATA	GROUND WATER/ INSTRUMENT INSTALLATION
		SURFACE ELEVATION: 721.4 FT.				
		(continued from previous page)		S-14	50/4"	
678.4	43	MEDIUM HARD to HARD (R3-R4), gray, slightly weathered BASALT; very highly jointed, joints 5-15° (smooth, planer) dominant, occasional healed high angle fractures, highly vesicular, trace secondary mineralization on joint surfaces and vesicles, up to 1/16 inch oxidation staining on joints and vesicles (ELEPHANT MOUNTAIN FLOW)	R-1	S-15	50/1"	
			R-2			
671.4	50	Bottom of Boring: 50 FT				

PENETRATION TEST (BLOWS PER FOOT)

WATER CONTENT (%)

10 20 30 40

45 50 55 60 65 70 75 80

20 40 60 80

RECOVERY/RQD (%)

LEGEND

- 2-INCH O.D. SPLIT SPOON
- 3-INCH O.D. SPLIT SPOON
- 3-INCH O.D. THIN WALL SAMPLER
- 3-INCH O.D. PITCHER TUBE SAMPLER
- * NO SAMPLE RECOVERY
- MM/DD/YY GROUND WATER LEVEL AND DATE OBSERVED
- LIQUID LIMIT
- WATER CONTENT
- PLASTIC LIMIT
- STANDARD PENETRATION TEST (BLOWS/FT.)
- WATER CONTENT IN PERCENT
- CORE RECOVERY IN PERCENT
- RQD IN PERCENT
- PT-1 PACKER TEST INTERVAL

NOTES

1. MATERIAL DESCRIPTIONS AND INTERFACES ARE INTERPRETIVE AND ACTUAL CHANGES MAY BE GRADUAL.
2. WATER LEVEL IS FOR DATE SHOWN AND MAY VARY WITH TIME OF YEAR.
3. 3/4-INCH DIAMETER STANDPIPE PIEZOMETER WITH 10 MICRON SCREEN BENTONITE CHIPS USED FOR SEAL.
4. OR WATER RESOURCES DEPT. UNIQUE WELL ID L118638.

HAMMER ASSEMBLY: AUTO TRIP

DRILL ROD USED: NWJ

SPT SAMPLER: NO LINER - RECESSED ID

BOREHOLE DIAM.: 5" 0 TO 43 FEET, 4" 43 TO 50 FEET

DRILLER: CASCADE DRILLING

DATE START: 3/30/2016 FINISH: 3/30/2016

DRILLING TECHNIQUE: MUD ROTARY / HQ3 CORING

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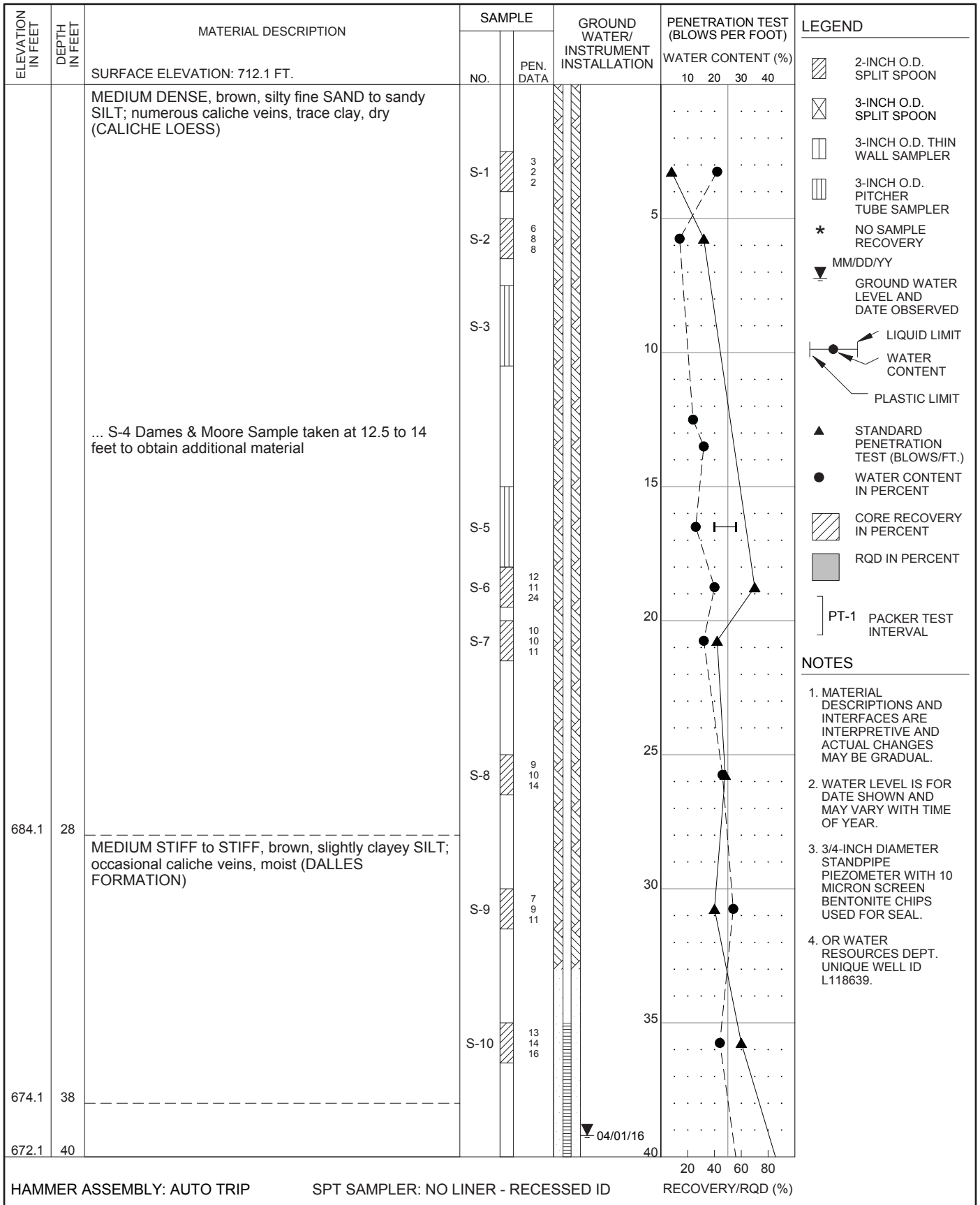
SUMMARY BORING LOG B-2 (2 of 2)

CARTY STATION - SOLAR FACILITY
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MAY 2016

PROJ 2488

FIG. 6



HAMMER ASSEMBLY: AUTO TRIP
SPT SAMPLER: NO LINER - RECESSED ID
DRILL ROD USED: NWJ
BOREHOLE DIAM.: 5" 0 TO 50 FEET

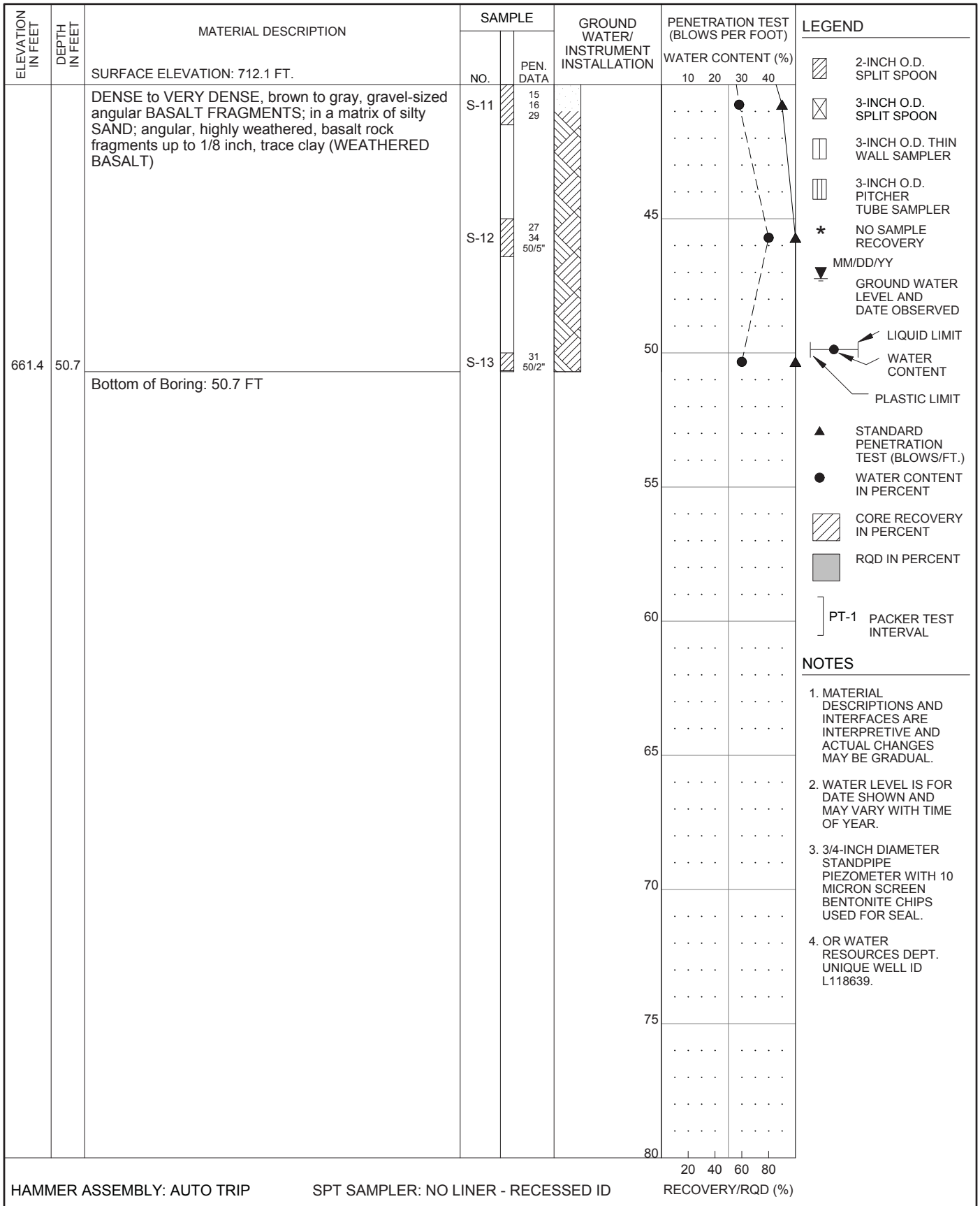
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DATE START: 3/29/2016 FINISH: 3/29/2016
DRILLING TECHNIQUE: MUD ROTARY

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SUMMARY BORING LOG B-3 (1 of 2)

CARTY STATION - SOLAR FACILITY
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FIG. 7



HAMMER ASSEMBLY: AUTO TRIP
SPT SAMPLER: NO LINER - RECESSED ID
DRILL ROD USED: NWJ
BOREHOLE DIAM.: 5" 0 TO 50 FEET

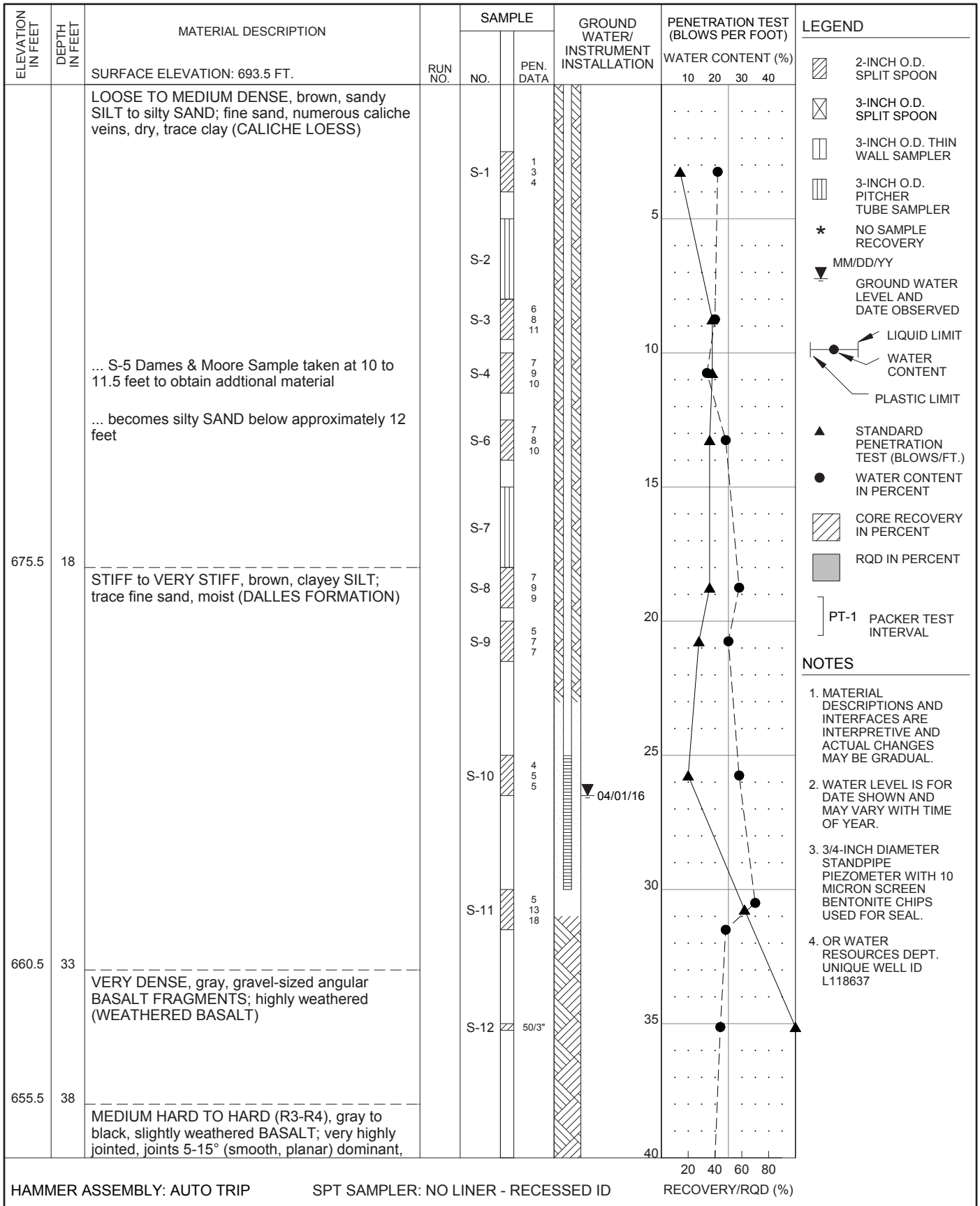
DRILLER: CASCADE DRILLING
DATE START: 3/29/2016 FINISH: 3/29/2016
DRILLING TECHNIQUE: MUD ROTARY

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SUMMARY BORING LOG B-3 (2 of 2)

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016
PROJ 2488
FIG. 7



HAMMER ASSEMBLY: AUTO TRIP
SPT SAMPLER: NO LINER - RECESSED ID
DRILL ROD USED: NWJ
BOREHOLE DIAM.: 5" 0 TO 38 FEET, 4" 38 TO 50 FEET

DRILLER: CASCADE DRILLING
DATE START: 3/29/2016 FINISH: 3/29/2016
DRILLING TECHNIQUE: MUD ROTARY / HQ3 CORING

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Phone 503-452-1100 Fax 503-452-1528

SUMMARY BORING LOG B-4 (1 of 2)

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016
PROJ 2488
FIG. 8

ELEVATION IN FEET	DEPTH IN FEET	MATERIAL DESCRIPTION	RUN NO.	SAMPLE NO.	SAMPLE PEN. DATA	GROUND WATER/ INSTRUMENT INSTALLATION
		SURFACE ELEVATION: 693.5 FT.				
		numerous joints 20-45°, vesicular, up to 1/16" oxidation stains on joints and vesicles, occasional calcite mineralization in vesicles (ELEPHANT MOUNTAIN FLOW)	R-1	S-13	50/1"	
			R-2			
643.5	50	Bottom of Boring: 50 FT				

PENETRATION TEST (BLOWS PER FOOT)
WATER CONTENT (%)
10 20 30 40
45
50
55
60
65
70
75
80
20 40 60 80
RECOVERY/RQD (%)

LEGEND

- 2-INCH O.D. SPLIT SPOON
- 3-INCH O.D. SPLIT SPOON
- 3-INCH O.D. THIN WALL SAMPLER
- 3-INCH O.D. PITCHER TUBE SAMPLER
- * NO SAMPLE RECOVERY
- MM/DD/YY GROUND WATER LEVEL AND DATE OBSERVED
- LIQUID LIMIT
- WATER CONTENT
- PLASTIC LIMIT
- STANDARD PENETRATION TEST (BLOWS/FT.)
- WATER CONTENT IN PERCENT
- CORE RECOVERY IN PERCENT
- RQD IN PERCENT
- PT-1 PACKER TEST INTERVAL

NOTES

1. MATERIAL DESCRIPTIONS AND INTERFACES ARE INTERPRETIVE AND ACTUAL CHANGES MAY BE GRADUAL.
2. WATER LEVEL IS FOR DATE SHOWN AND MAY VARY WITH TIME OF YEAR.
3. 3/4-INCH DIAMETER STANDPIPE PIEZOMETER WITH 10 MICRON SCREEN BENTONITE CHIPS USED FOR SEAL.
4. OR WATER RESOURCES DEPT. UNIQUE WELL ID L118637

HAMMER ASSEMBLY: AUTO TRIP
DRILL ROD USED: NWJ
SPT SAMPLER: NO LINER - RECESSED ID
BOREHOLE DIAM.: 5" 0 TO 38 FEET, 4" 38 TO 50 FEET

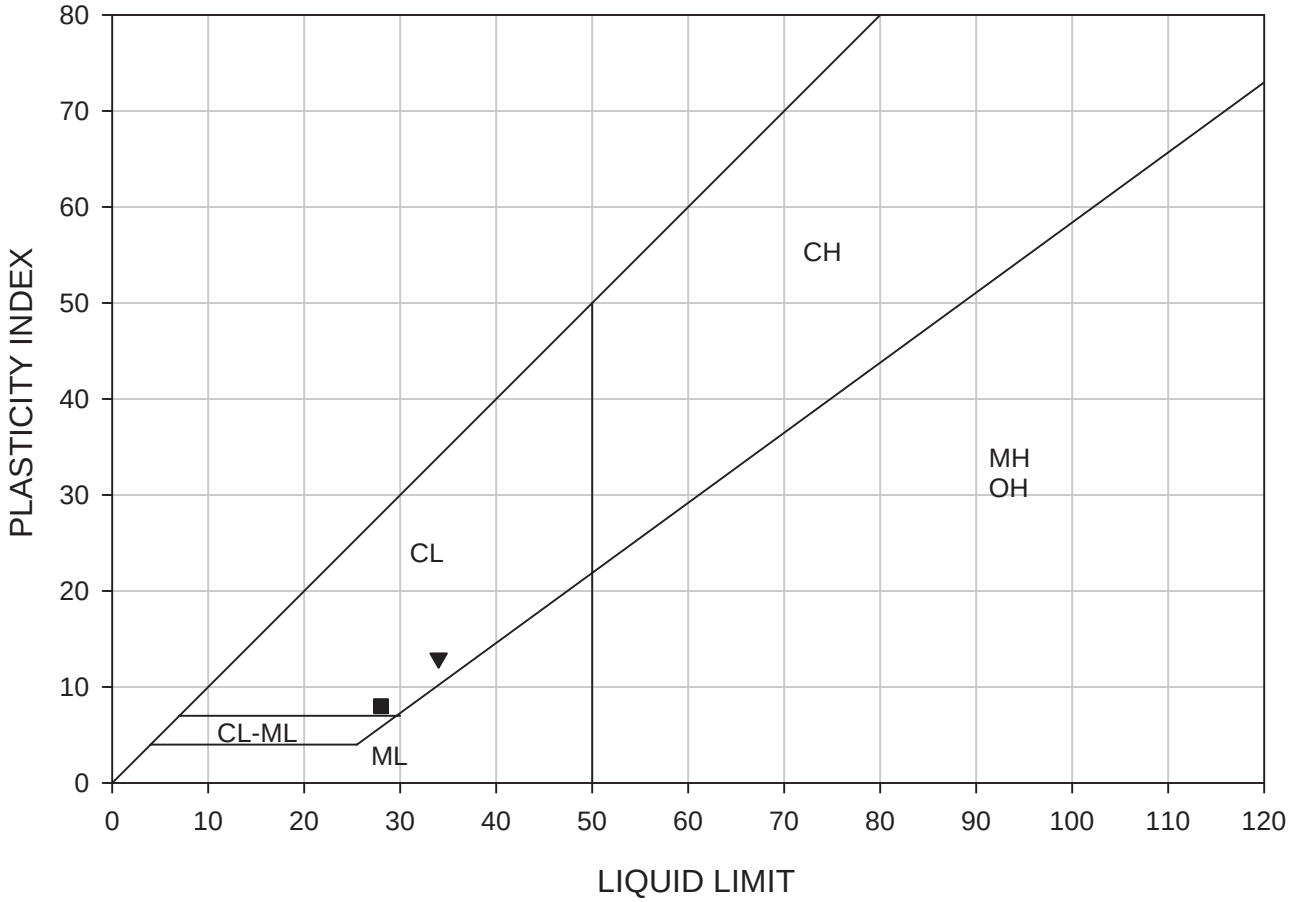
DRILLER: CASCADE DRILLING
DATE START: 3/29/2016 FINISH: 3/29/2016
DRILLING TECHNIQUE: MUD ROTARY / HQ3 CORING

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SUMMARY BORING LOG B-4 (2 of 2)

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016
PROJ 2488
FIG. 8



Boring No.	Sample No.	Depth	LL	PL	PI
B-1	S-4	10'-13'	- -	- -	NP
▼ B-2	S-9	20'-23'	34	21	13
■ B-3	S-5	15'-18'	28	20	8
B-4	S-2	5'-8'	- -	- -	NP

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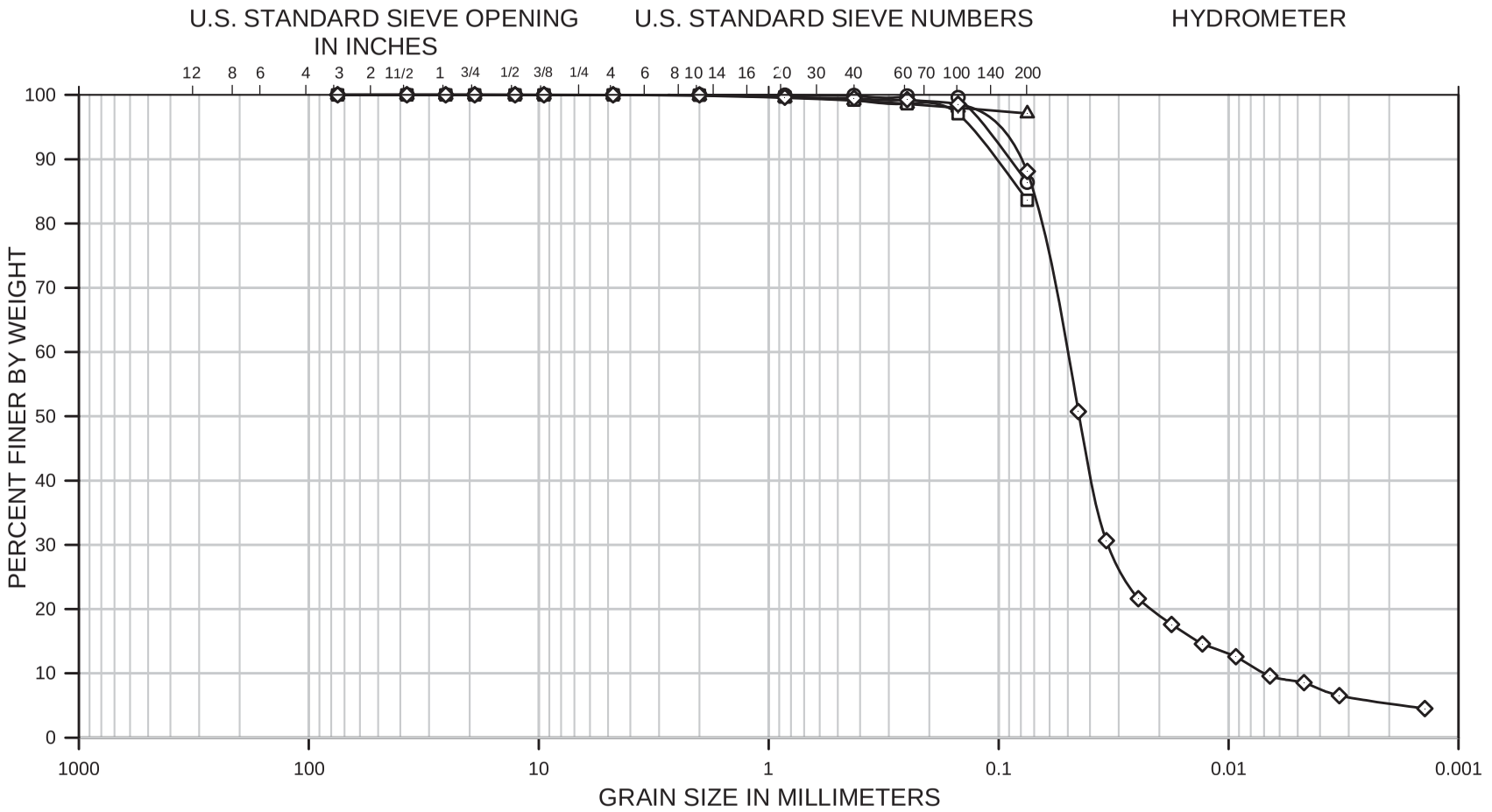
PLASTICITY CHART

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016

PROJ. 2488

FIG. 9



COBBLES	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay

Boring No.	Sample No.	Depth	Classification	Nat W%	LL	PL	PI
B-1	S-4	10'-13'	Sandy Silt	12	--	--	NP
B-2	S-9	20'-23'	Sandy, Slightly Clayey Silt	16	34	21	13
B-3	S-5	15'-18'	Sandy, Slightly Clayey Silt	13	28	20	8
B-4	S-2	5'-8'	Sandy Silt	15	--	--	NP

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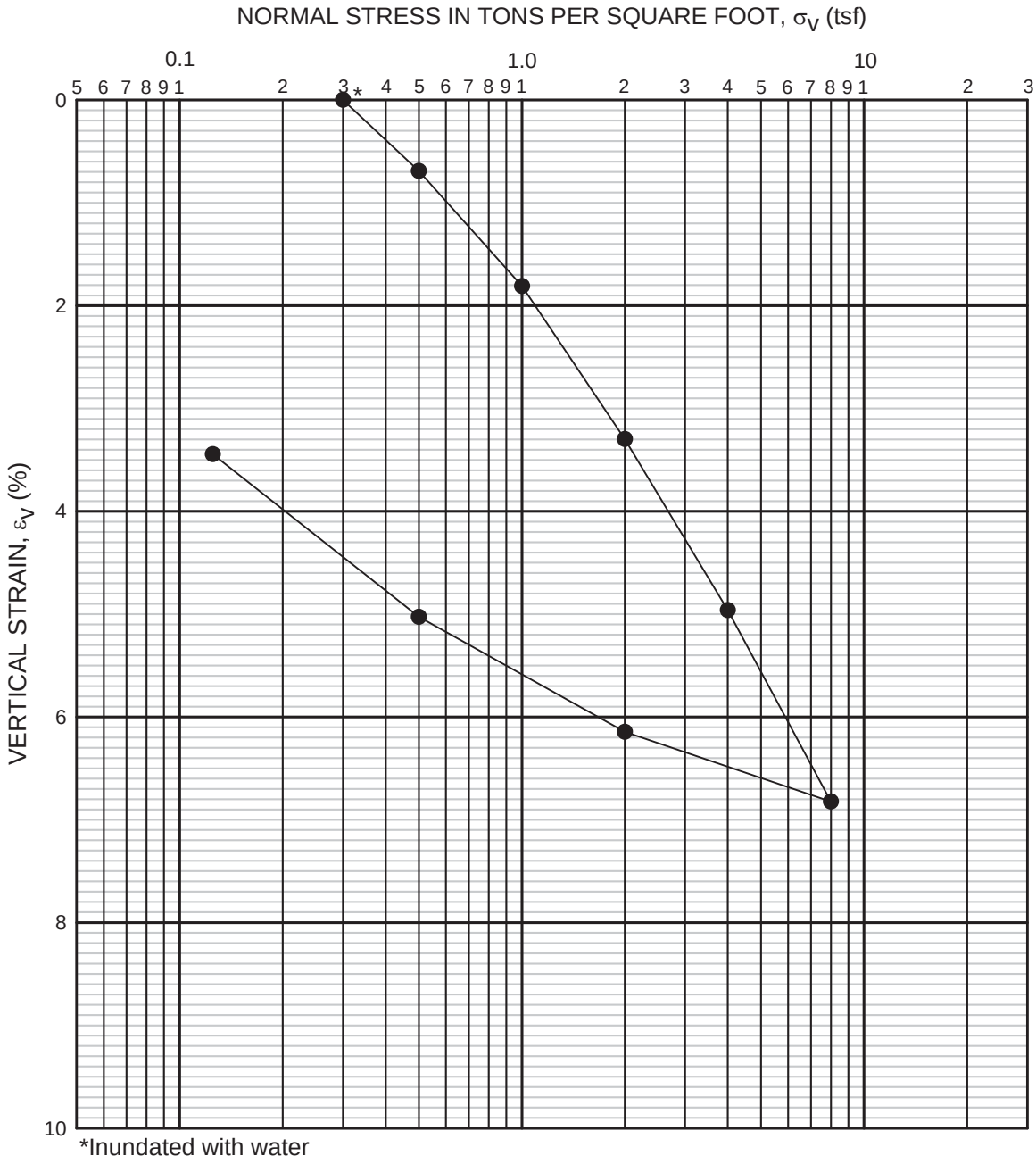
GRADATION GRAPH

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016

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FIG. 10



Boring No. B-1 Sample No. S-4 Depth of Sample 10 to 13 ft.

Soil Description MEDIUM DENSE, brown, sandy SILT to silty SAND

☒ Undisturbed ☐ Re-compacted

Initial Conditions: Height 0.75 inches Wet Density 130 lb/ft^3

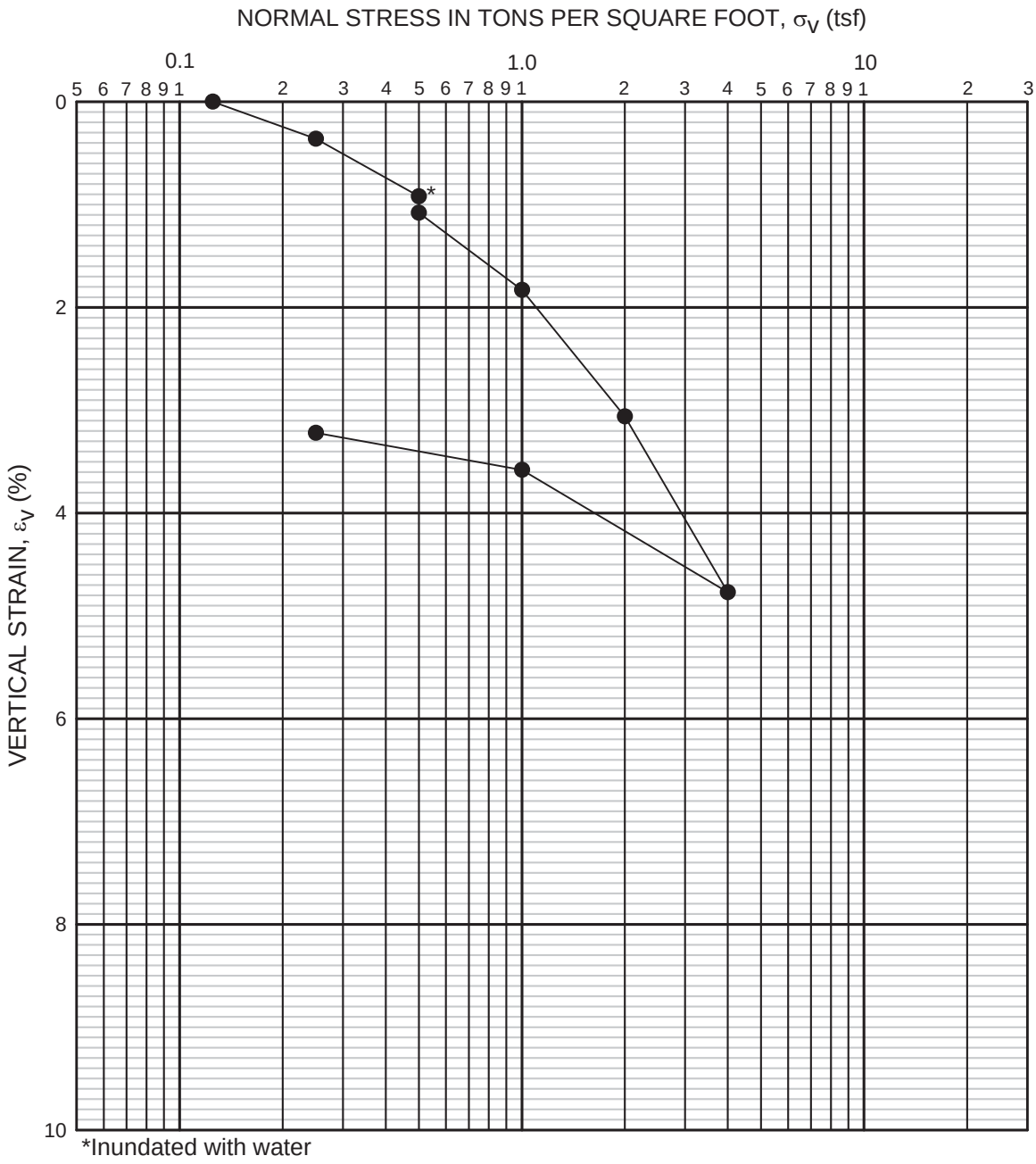
Diameter 2.50 inches Water Content 18 %

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CONSOLIDATION TEST

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MAY 2016
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FIG. 11



Boring No. B-2 Sample No. S-9 Depth of Sample 20 to 23 ft.

Soil Description DENSE, brown, sandy SILT

☒ Undisturbed ☐ Re-compacted

Initial Conditions: Height 0.75 inches Wet Density 105 lb/ft^3

Diameter 2.5 inches Water Content 16 %

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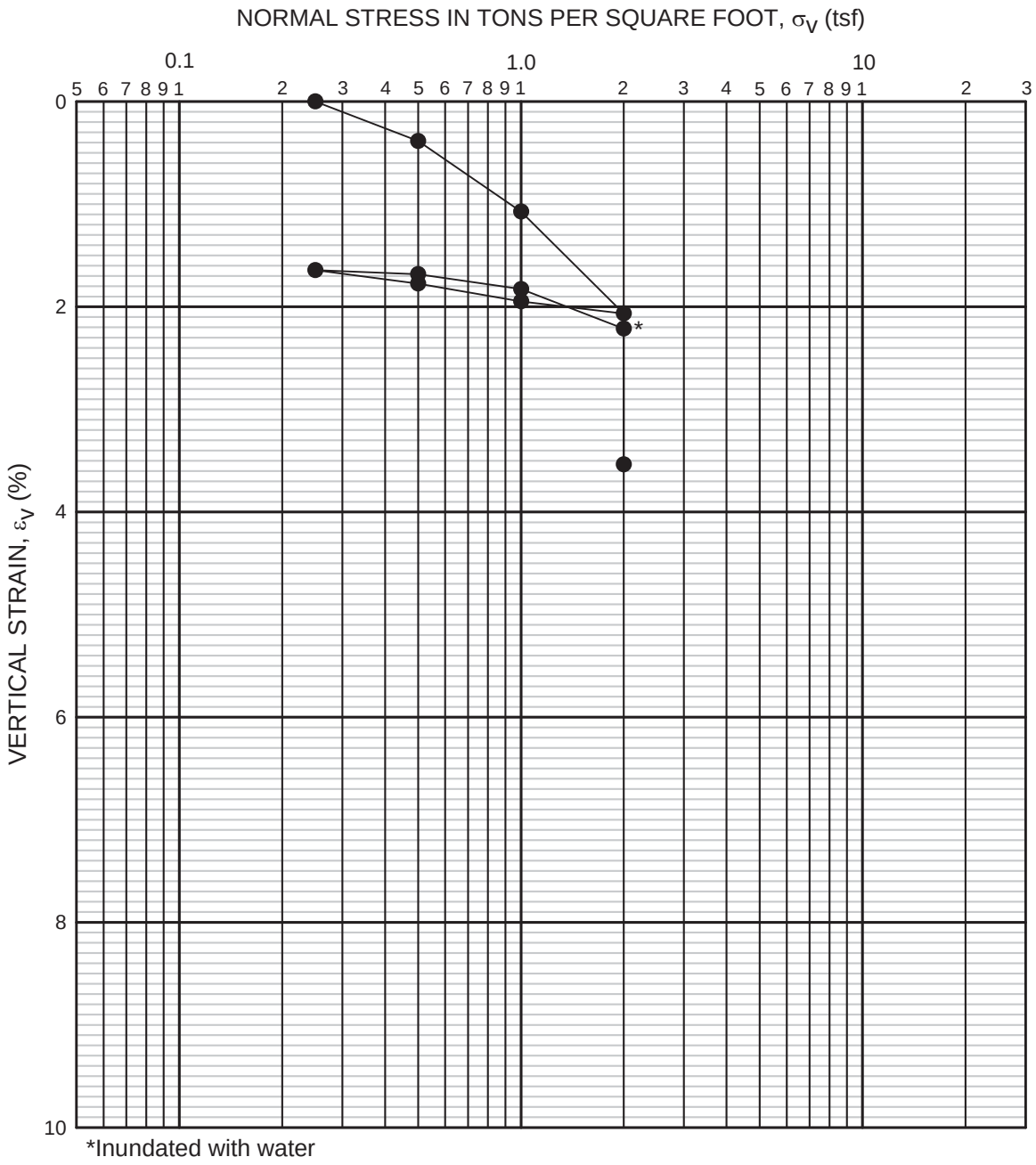
COLLAPSE/CONSOL. TEST

CARTY STATION - SOLAR FACILITY
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PROJ. 2488

FIG. 12



Boring No. B-3 Sample No. S-5 Depth of Sample 15 to 18 ft.

Soil Description MEDIUM DENSE, brown, silty SAND to sandy SILT

☒ Undisturbed ☐ Re-compacted

Initial Conditions: Height 0.75 inches Wet Density 115 lb/ft^3

Diameter 2.5 inches Water Content 13 %

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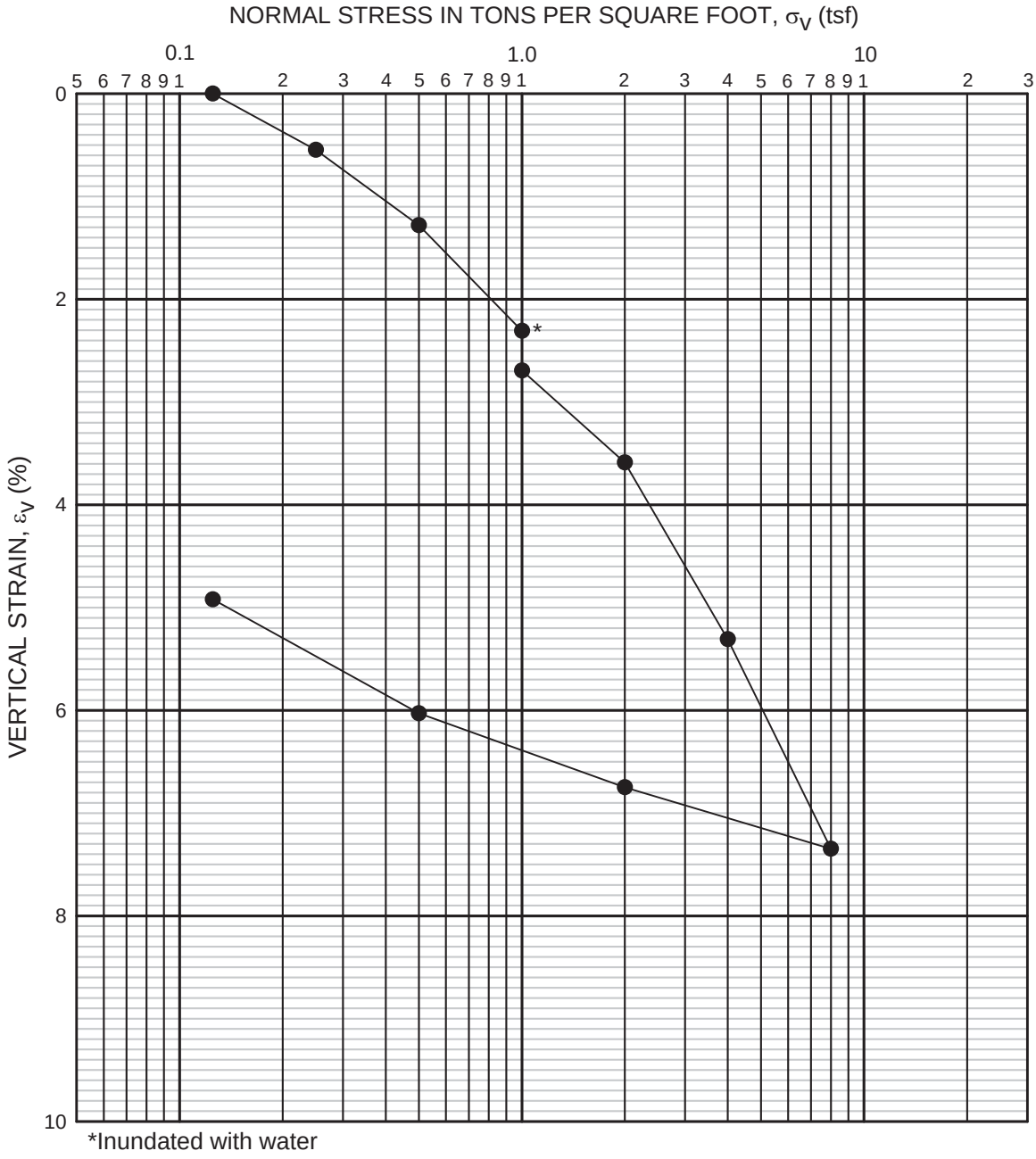
COLLAPSE TEST

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FIG. 13



Boring No. B-4 Sample No. S-2 Depth of Sample 5 to 8 ft.

Soil Description LOOSE to MEDIUM DENSE, brown, sandy SILT

☒ Undisturbed ☐ Re-compacted

Initial Conditions: Height 0.75 inches Wet Density 97 lb/ft^3

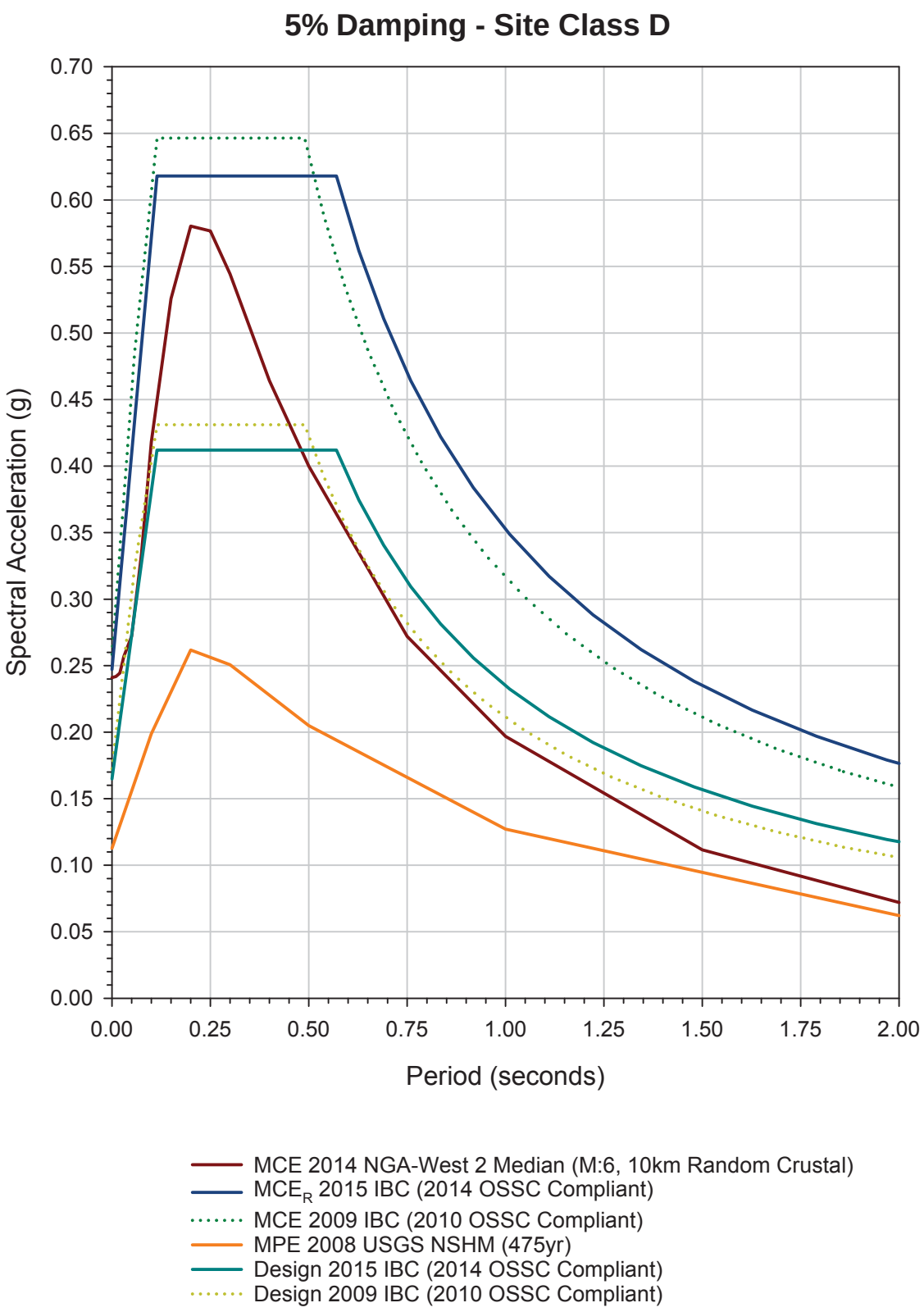
Diameter 2.5 inches Water Content 16 %

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COLLAPSE/CONSOL. TEST

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FIG. 14



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RESPONSE SPECTRA COMPARISON

CARTY STATION - SOLAR FACILITY
BOARDMAN, OREGON

MAY 2016

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FIG. 15

APPENDIX A

EARTH DYNAMICS LLC

Wenner Field Resistivity Measurements
Carty Generating Station - Solar Facility Project

EARTH DYNAMICS LLC

2284 N.W. Thurman Street
Portland, Oregon 97210
(503) 227-7659 (Phone)
(503) 227-1074 (FAX)

April 12, 2016

Mr. Randy Hill
Cornforth Consultants, Inc.
10250 SW Greenburg Rd. STE 111
Portland, OR 97223

RE: Wenner Resistivity Measurements for the Boardman-Carty Complex Project.

Dear Mr. Hill:

At your request, Earth Dynamics performed Wenner Array Resistivity measurements at the Boardman-Carty Complex near Boardman, Oregon. These data are needed to help develop a grounding grid design for a proposed solar panel project. Cornforth Consultants, Inc. provided the location coordinates for the study. Wenner resistivity data were acquired on April 8, 2016 by Mr. Daniel Lauer of Earth Dynamics.

Resistivity measurements are obtained using the Wenner four-electrode method in accordance with ANSI/IEEE Standard 81-1983 and *ASTM G 57–95a (re-approved 2012), Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method*. An Advanced Geosciences, Inc. Sting R1 Earth Resistivity Meter and a Wenner electrode array are used for the electrical resistivity sounding. For each measurement, the instrument applies a current (I), reverses polarity and applies the current again and then reverses polarity back to the original and applies current a third time. The reversed polarity technique is used to reduce electrode polarization. The voltage (V) at the potential electrodes is measured for each current injection, and the values are averaged. The average resistance (V/I), resistivity and standard deviation between two measurement cycles are displayed on a screen and stored in the internal memory. The memory also stores the date and time of the measurement, and the electrode configuration. The system does not require scale multipliers that are common on older analog resistivity meters.

The Sting R1 Meter calibration was checked in the field in accordance with the manufacturer's recommendations using a test resistor before and after acquiring resistivity data. All calibration values were within the specified tolerances for the instrument. Wenner sounding data were acquired in north-south and east-west orientations at the provided GPS coordinates of 45° 40' 47.54"N, 119° 47' 02.43"W. Data were acquired using Wenner A-spacings of 2.5, 5, 10, and 20 feet in both the North-South direction and in the East-West direction. Approximately 4 ounces of saline solution was applied to each electrode placement to reduce contact resistance with the soil.

The data for Wenner sounding were acquired from 11:00 to 11:50 on March 8, 2016. At the time of the data acquisition, the air temperature was approximately 65-70°F. The weather was calm, dry and sunny. A six-inch temperature probe inserted into the soil provided a temperature reading of 64°F.

The results of the Wenner sounding are contained in Table 1. Apparent electrical resistivity is listed in Ohm-feet since the requested A spacings were in feet. To comply with the ASTM G 57 standard, he apparent resistivity values are converted to Ohm-cm and also contained in Table 1. A flagged wooden survey stake marked "ED Wenner" was placed in the field at the center point of the survey.

Table 1. Summary of measured data for Wenner Sounding at Latitude 45° 40' 47.54"N and Longitude 119° 47' 02.43"W.

Wenner A spacing (ft)	Electrode insertion depth (in)	Measured Resistance (Ω)	Apparent Resistivity (Ω-ft)	Apparent Resistivity (Ω-cm)
East-West				
2.5	0.5	30.51	479.0	14,599.9
5	1.0	13.38	420.2	12,807.7
10	1.5	6.615	415.4	12,661.4
20	2.0	2.006	252.0	7,681.0
North-South				
2.5	0.5	34.18	536.6	16,355.6
5	1.0	17.37	545.4	16,623.8
10	1.5	6.492	407.7	12,426.7
20	2.0	1.574	198.0	6,035.0

No warranty, express or implied, is made or intended by presentation of this work. Earth Dynamics accepts no responsibility for damages as a result of decisions made or actions taken based on this report.

It has been a pleasure working with you on this project. Please do not hesitate to call if you have any questions.

Sincerely,



Daniel Lauer
Principal - Senior Geophysicist

APPENDIX B

EARTH DYNAMICS LLC

Soil Sample Laboratory Resistivity Measurements
Carty Generating Station – Solar Facility Project

EARTH DYNAMICS LLC

2284 N.W. Thurman Street
Portland, Oregon 97210
(503) 227-7659 (Phone)
(503) 227-1074 (FAX)

April 19, 2016

Mr. Randy Hill
Cornforth Consultants, Inc.
10250 SW Greenburg Rd. STE 111
Portland, OR 97223

RE: Soil Sample Resistivity Measurements for the Boardman-Carty Complex Project.

Dear Mr. Hill:

At your request, Earth Dynamics performed resistivity measurements on two soil samples from the Boardman-Carty Complex near Boardman, Oregon. These data are needed to help develop a grounding grid design for a proposed solar panel project. Cornforth Consultants, Inc. provided samples from two borings completed at the project site (B1 and B3). Resistivity measurements were acquired on April 19, 2016 by Mr. Daniel Lauer of Earth Dynamics.

Resistivity measurements are obtained in the laboratory using a Miller Soil Box in accordance with the following two ANSI Standards:

- *ASTM G 57–95a (re-approved 2012), Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method*.
- *ASTM G187-12a, Standard Test Method for Measurement of Soil Resistivity Using the Two-Electrode Soil Box Method*.

An Advanced Geosciences, Inc. Sting R1 Earth Resistivity Meter and a Miller Soil Box were used to acquire resistivity measurements. For each measurement, the instrument applies a current (I), reverses polarity and applies the current again and then reverses polarity back to the original and applies current a third time. The reversed polarity technique is used to reduce electrode polarization. The voltage (V) at the potential electrodes is measured for each current injection, and the values are averaged. The average resistance (V/I), and standard deviation between two measurement cycles are displayed on a screen and stored in the internal memory.

The Sting R1 Meter calibration was checked in accordance with the manufacturer's recommendations using a test resistor before and after acquiring resistivity data. All calibration values were within the specified tolerances for the instrument.

The soil samples were delivered in glass jars to Earth Dynamics' lab on April 7, 2016 by Cornforth Consultants personnel. For the resistivity testing, soil from two jars labelled B-1 : S7 were combined into one test specimen and soil from three jars labelled B-3 : S4 were combined into a second test specimen. Each specimen was saturated using distilled water and placed into the Miller Soil Box for testing.

The soil box resistivity measurements were acquired in Earth Dynamics' laboratory on April 19, 2016. At the time of the data acquisition, the air temperature was 73.0°F and the sample temperature was 71.3°F. Four measurements were made for each specimen and each test configuration.

The results of the testing using ASTM G57 are contained in Table 1. The results of the testing using ASTM G187 are contained in Table 2.

Table 1. Summary of measured resistivity data using ASTM G 57 Four-Electrode Method.

Sample	Listed Sample Depth	Average Measured Resistance (Ω)	Standard Deviation (Ω)	Miller Box Scale Factor	Average Measured Resistivity (Ω-cm)
B1 : S7	15^0 - 16^3	1,069	2.6	1	1,069
B3 : S4	12^5 – 14^0	1,064	1.9	1	1,064

Table 2. Summary of measured resistivity data using ASTM G 187 Two-Electrode Method.

Sample	Listed Sample Depth	Average Measured Resistance (Ω)	Standard Deviation (Ω)	Miller Box Scale Factor	Average Measured Resistivity (Ω-cm)
B1 : S7	15^0 - 16^3	1,942	0.7	0.57	1,106
B3 : S4	12^5 – 14^0	1,920	2.9	0.57	1,095

No warranty, express or implied, is made or intended by presentation of this work. Earth Dynamics accepts no responsibility for damages as a result of decisions made or actions taken based on this report.

It has been a pleasure working with you on this project. Please do not hesitate to call if you have any questions.

Sincerely,

Daniel Lauer
Principal - Senior Geophysicist

EXHIBIT I – Request for Amendment No. 1

SOILS

OAR 345-021-0010(1)(i)

TABLE OF CONTENTS

I.1 INTRODUCTION.....I-1

I.2 MAJOR SOIL TYPES I-1

I.3 LAND USES I-4

I.4 POTENTIAL ADVERSE IMPACTS I-5

I.5 MITIGATION MEASURES I-5

I.6 MONITORING PROGRAM.....I-7

I.7 REFERENCES.....I-8

FIGURES

Figure I-1 Major Soil Types

APPENDICES

Appendix I-1 1200-C Construction Stormwater Permit Application and DEQ Acknowledgement Letter

I.1 INTRODUCTION

OAR 345-021-0010(1)(i) *Information from reasonably available sources regarding soil conditions and uses in the analysis area, providing evidence to support findings by the Council as required by OAR 345-022-0022.*

Response: This exhibit provides the information required by Oregon Administrative Rules 345-021-0010(1)(i) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). This exhibit addresses the soil types and conditions within the amended Site Boundary. In addition, it provides information specific to the Carty Solar Farm (as defined in Exhibit B). The Application for Site Certificate provides information regarding the soil conditions and uses associated with the Carty Generating Station as originally proposed.

I.2 MAJOR SOIL TYPES

OAR 345-021-0010(1)(i)(A) *Identification and description of the major soil types in the analysis area.*

Response: There are nine soil map units (also known as soil types) within the amended Site Boundary, as identified by the Soil Survey Geographic (SSURGO) database, which is managed by the Natural Resources Conservation Service (NRCS) (NRCS n.d.[a]). Figure I-1 shows the location and geographic extent of the soil map units within the amended Site Boundary.

Table I-1 displays acreages of each soil map unit within the amended Site Boundary, within the Carty Solar Farm generation facility site, and within supporting and related facilities and temporary construction laydown and parking areas.

Table I-1 Soil Type by Acres within the Amended Site Boundary

Map Unit	Soil Type	Acres within Amended Site Boundary	Acres within Carty Solar Farm Generation Facility Site	Acres within Supporting and Related Facilities and Construction Laydown Areas[1]
9	Dune Land	53.67	32.83	2.60
53A	Royal silt loam, 0% to 3% slopes	56.63	0.00	2.13
54B	Sagehill fine sandy loam, 2% to 5% slopes	503.50	30.14	117.04
54D	Sagehill fine sandy loam, 12% to 20% slopes	56.31	0.00	2.93
55B	Sagehill fine sandy loam, hummocky, 2%	260.84	245.45	2.00

Table I-1 Soil Type by Acres within the Amended Site Boundary				
Map Unit	**Soil Type**	**Acres within Amended Site Boundary**	**Acres within Carty Solar Farm Generation Facility Site**	**Acres within Supporting and Related Facilities and Construction Laydown Areas[1]**
	to 5% slopes			
55C	Sagehill fine sandy loam, hummocky, 5% to 12% slopes	83.54	6.22	20.29
58B	Taunton fine sandy loam, 2% to 5% slopes	511.93	0.00	17.01
58C	Taunton fine sandy loam, 5% to 12% slopes	51.97	0.00	7.61
78	Xeric Torriorthents, Nearly Level	2.60	0.00	0.00

Notes:
[1] This table includes all temporary construction laydown and parking areas, as well as 80-foot-wide corridors centered on the potential routes for the interconnection transmission line. However, during final design, the selected transmission line would be micro-sited within this corridor.

The following sections provide brief descriptions of each soil map unit, including identification of drainage class, permeability, erosivity, and Land Capability Class (LCC) and LCC subclass. Managed by the NRCS, LCC is a system of grouping soil map unit components primarily on their capability to produce common cultivated crops and pasture plants without causing soil deterioration over a long (though undefined) period of time (NRCS n.d.[b]). There are eight classes, ranging from Class I, which denotes soils with slight limitations that restrict their use, to Class VIII, which denotes soils and miscellaneous areas that have limitations precluding their use for commercial plant production and thereby restrict them to recreation, wildlife, water supply, or aesthetic purposes. The two subclasses presented are "e," which indicates susceptibility to erosion as the dominant problem affecting their use, and "s," which indicates limitations within the rooting zone such as shallow rooting depth, abundance of stones, low moisture-holding capacity, low fertility that is difficult to correct, and salinity or sodium content. Given that the soil map units within the amended Site Boundary are all consociations, which are map units dominated by a single component and similar soils, the LCCs and subclasses presented apply to each map unit.

I.2.1 Dune Land (Map Unit Symbol 9)

This is an excessively drained sandy eolian soil. Permeability is very rapid. Runoff is slow, and the hazard of water erosion is slight. The hazard of wind erosion of soil is high. The LCC and subclass for this soil is VIIIe for dryland, and it is not rated for irrigated land. This soil is not

suitable for grazing and has limitation for community and recreation developments. It is well suited for wildlife habitat (Hosler 1983).

I.2.2 Royal Silt Loam, 0 to 3 Percent Slopes (Map Unit Symbol 53A)

This is a very deep, well-drained soil formed in wind-laid material. It occupies long, narrow areas of alluvial bottom lands adjacent to streams. In a representative profile, the surface layer is very dark grayish brown silt loam about 6 inches thick. The subsoil is dark brown and dark grayish brown fine sandy loam about 27 inches thick. The substratum is dark grayish brown stratified fine sandy loam and fine sand that extends to a depth of 60 inches or more. Permeability is moderately rapid, runoff is slow, and the hazard of water erosion is slight. The LCC and subclass for this soil are VIe for dryland and IIs for irrigated land. The hazard of soil blowing is moderate. This soil is generally well suited to community and recreation uses. Sanitary facilities, such as sewage lagoons and sanitary landfills, may require some modification because of seepage.

I.2.3 Sagehill Fine Sandy Loam, 2 to 5 Percent Slopes (Map Unit Symbol 54B)

This is a very deep, well-drained soil formed in wind-laid material and calcareous lacustrine sediment. It is one of the predominant soil types within the amended Site Boundary. In a representative profile, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is dark brown fine sandy loam about 16 inches thick. The upper 7 inches of the substratum is dark brown fine sandy loam. Below this is brown and dark grayish brown silt loam that extends to a depth of 60 inches or more. Permeability is moderately rapid as far down as the substratum and moderate in the substratum. Runoff is slow, and the erosion hazard is slight. The hazard of soil blowing is moderate. The LCC and subclass for this soil are VIe for dryland and IIe for irrigated land. This soil is generally well suited to community and most recreation uses.

I.2.4 Sagehill Fine Sandy Loam, 12 to 20 Percent Slopes (Map Unit Symbol 54D)

Sagehill fine sandy loam is described above. The LCC and subclass for this soil are IVe for dryland and VIe for irrigated land. The slope is a limitation for most community and recreational development.

I.2.5 Sagehill Fine Sandy Loam, Hummocky, 2 to 5 Percent Slopes (Map Unit Symbol 55B)

Sagehill fine sandy loam is described above. The LCC and subclass for this soil is IVe for dryland and IIe for irrigated land. This soil is limited for community uses by the hummocky relief, as well as rapid percolation. In places, modifications in the design of facilities for these uses are necessary. This soil is generally well suited to recreational uses.

I.2.6 Sagehill Fine Sandy Loam, Hummocky, 5 to 12 Percent Slopes (Map Unit symbol 55C)

Sagehill fine sandy loam is described above. The LCC and subclass for this soil is IVe for dryland and IIIe for irrigated land. The slope and rapid percolation are limitations for community and most recreation uses. In places, modifications in the design of facilities for these uses are necessary.

I.2.7 Taunton Fine Sandy Loam, 2 to 5 Percent Slopes (Map Unit Symbol 58B)

This is a moderately deep, well-drained soil formed in old alluvium that has been reworked by wind. In a representative profile, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The subsoil is dark brown fine sandy loam about 10 inches thick. The substratum is dark brown, calcareous very fine sandy loam about 17 inches thick. A cemented, calcareous hardpan is at a depth of about 32 inches. Permeability is moderately rapid. Runoff is medium, and the hazard of water erosion is moderate. The hazard of soil blowing is moderate. The LCC and subclass for this soil is VIe for dryland and IVe for irrigated land. The cemented hardpan is a limitation for sanitary facilities. Other uses for community development, such as dwellings and commercial buildings, are limited because of the pan and the low strength of the soil. This soil is suitable for the construction of roads and streets. There are few limitations for most recreation facilities.

I.2.8 Taunton Fine Sandy Loam, 5 to 12 Percent Slopes (Map Unit Symbol 58C)

Taunton fine sandy loam is described above. The LCC and subclass for this soil is VIe for dryland and IVe for irrigated land. Commercial buildings may need variations in design because of the slope. Construction of dwellings is limited because of the slope and low strength of the soil. In places, modifications in the design of facilities for these uses are necessary. The slope is a limitation for roads, streets, and recreation facilities.

I.2.9 Xeric Torriorthents, Nearly Level (Map Unit Symbol 78)

This is a very deep, well-drained soil formed in recent mixed alluvium on stream bottoms. In a representative profile, the surface layer is a dark brown, sandy loam. The subsoil is a dark brown, fine sandy loam over a dark grayish brown gravelly sandy loam and very gravelly loamy sand. The LCC and subclass for this soil is VIe for dryland and IIIe for irrigated land. The hazard of water erosion is high, and runoff is very rapid. This soil is well suited for irrigated cropland (Hosler 1983).

I.3 LAND USES

OAR 345-021-0010(1)(i)(B) *Identification and description of current land uses in the analysis area, such as growing crops, that require or depend on productive soils.*

Response: The predominant land uses in the amended Site Boundary are open rangeland (e.g., shrub steppe and disturbed grasslands), cultivated cropland (Threemile Canyon Farms), and developed/industrial (Boardman Plant and Carty Generating Station Unit 1). The proposed Carty Solar Farms site and the associated routes for the interconnection transmission line are essentially flat, with minimal slopes. No parts of the Carty Solar Farm would occupy land currently used for growing crops or anticipated to be used for agriculture in the future. These areas are not currently used for any purpose; the majority of them were previously set aside for potential ash disposal areas for the Boardman Power Plant.

I.4 POTENTIAL ADVERSE IMPACTS

OAR 345-021-0010(1)(i)(C) *Identification and assessment of significant potential adverse impact to soils from construction, operation and retirement of the facility, including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.*

Response: During construction, potential adverse impacts on the soils present in the amended Site Boundary could result from wind or water erosion; potential oil or other spills from stationary or power-driven equipment; soil compaction; and, possibly, from construction debris and other construction pollutants. The erosion hazard for soils found within the amended Site Boundary range from slight to moderate.

Construction activities would increase the risk of introducing or spreading invasive weeds in the amended Site Boundary. The seeds or propagules of invasive weeds affixed to tires and undercarriages of construction equipment and vehicles could be transported onto the site or spread from one project location to another. Refer to the Revegetation and Noxious Weed Control Plan (Exhibit P, Appendix P-4), developed in consultation with the Morrow County weed inspector regarding revegetation to minimize potential impacts.

Refer to Exhibit G of the Application for Site Certificate for information regarding the handling, storage, and monitoring of chemical or other hazardous materials.

I.5 MITIGATION MEASURES

OAR 345-021-0010(1)(i)(D) *A description of any measures the applicant proposes to avoid or mitigate adverse impact to soils.*

Response: During construction of the Carty Solar Farm, the contractor would be required to take all measures necessary to ensure soil protection, including, but not limited to, erosion control with silt fences or similar methods. Portland General Electric Company (PGE) must obtain and follow the requirements of a National Pollutant Discharge Elimination System (NPDES) permit for construction activities (NPDES 1200-C permit) and prepare and implement an associated Erosion and Sediment Control Plan (ESCP). A 1200-C permit application has been submitted to

the Oregon Department of Environmental Quality (DEQ) based on the level of detail currently available. PGE recognizes that updated ESCP drawings may be required once detailed construction plans are available. Following the requirements of the NPDES 1200-C permit and measures described in the associated ESCP will help minimize or avoid potential impacts on soils. If erosion control best management practices are ineffective, this will be identified through routine inspections required by the 1200-C permit in a timely manner, and corrective actions will be implemented promptly.

A copy of the 1200-C permit application and associated ESCP is provided in Appendix I-1 of this RFA. Appendix I-1 also includes an acknowledgment letter from DEQ confirming receipt of the permit application. Note that the permit application and ESCP submitted to DEQ was prepared for a previous draft of this RFA, submitted to the Oregon Department of Energy in August 2016. Since that submittal, PGE has modified its plans for the project. References to Unit 2 and Unit 3 included in the permit application and ESCP are no longer relevant to PGE's amendment request and are not incorporated into the evaluation of compliance with applicable Oregon Energy Facility Siting Council of standards. PGE discussed the permit application and ESCP with DEQ, and DEQ confirmed that the agency does not need to see a revised version of the plan at this time. PGE would submit revised ESCP drawings for DEQ's approval prior to starting construction.

PGE would implement measures to reduce the potential impacts of soil compaction during the restoration phase of construction, as described in the Revegetation and Noxious Weed Control Plan (RNWCP), provided in Appendix P-4. Areas of temporary disturbance would be graded to be consistent with existing topography and drainage patterns as soon as possible after the final construction ground disturbance. If necessary, areas compacted by construction activities would be ripped to a depth of 12 inches where feasible, and roughened to provide maximum surface area for seed-soil contact and to reduce the chance of seed loss due to wind.

To avoid potential adverse impacts on soil during construction from oil and other spills, the contractor would be required to prepare a Construction Spill Prevention Control and Countermeasure Plan (SPCC). Federal SPCC regulations do not require SPCC plans during construction; therefore, the construction plan would not be submitted to DEQ or the United States Environmental Protection Agency. An SPCC plan is required for operation of a facility if the total aboveground storage capacity of oil and oil products exceeds 1,320 gallons, and if, because of its location, the facility could reasonably be expected to discharge oil into navigable waters of the United States. The oil storage locations at the Carty Generating Station are located a considerable distance from navigable waters; therefore, it is not reasonably expected that a potential oil spill would reach navigable waters of the United States. Accordingly, the SPCC rule under 40 Code of Federal Regulations 112 would not apply. However, Site Certificate Condition 5.9 does require PGE to develop an SPCC plan for the Carty Generating Station; PGE will update the project's SPCC plan to reflect new amounts and locations of oil-containing equipment

or containers; the additional amounts and locations of oil will not result in any new or modified measures to avoid or mitigate adverse impacts to soils. The existing measures to avoid or mitigate adverse impacts to soils, which would also apply to operation of the solar farm, are listed in Section 2.3.2 of the SPCC plan and repeated below:

- Provide secondary containment for oil-containing equipment or containers with a volume of 55 gallons or greater and ensure that containment structures are kept empty of liquids and other material to provide maximum containment capacity.
- Inspect palletized and drum shipments for leaks and corrosion prior to entering the site.
- Employees will be present and monitoring transfer activities to fuel tanks; no material transfers will be left unattended.
- Employees will promptly abate any observed discharge.

In addition, PGE has developed and maintains Oil Spill Response Procedures, which are included with the SPCC plan. The SPCC plan is a self-certified plan and does not require submittal to DEQ or the United States Environmental Protection Agency.

I.6 MONITORING PROGRAM

OAR 345-021-0010(1)(i)(E) *The applicant's proposed monitoring program, if any, for adverse impact to soils during construction and operation.*

Response: Monitoring would be performed for the Carty Solar Farm as required by applicable permits to help ensure there are no significant potential adverse impacts on soils. Post-construction soil stabilization monitoring would follow the requirements in the ESCP under the 1200-C permit and the project's RNWCP. Under the ESCP in the 1200-C permit, inspections will be conducted monthly (or as stipulated in the permit) until the site meets criteria for closure of the 1200-C permit. The 1200-C permit expires December 14, 2020. If PGE holds a 1200-C permit for the project at the time a new general permit is issued, the monitoring requirements in the new general permit, if different, will be followed. Per the RNWCP, soil stabilization measures will be monitored annually during revegetation monitoring for at least five years, or until the site meets the revegetation success criteria. ESCP measures would minimize loss of soil. Scarification of compacted soils would occur as necessary for revegetation.

During construction, disturbed area erosion and sediment control measures would be visually monitored at the intervals and locations required by the 1200-C permit issued to the site. Erosion and sediment control measures would be maintained by removing trapped sediment at the storage capacities specified by the 1200-C permit issued to the site.

After completing construction in an area, PGE would monitor the area until soils are stabilized, to evaluate whether construction-related impacts on soils are being adequately addressed by the mitigation procedures described in the ESCP and the RNWCP. As necessary, PGE would

implement follow-up restoration measures, such as scarification and reseeding, to address those remaining impacts.

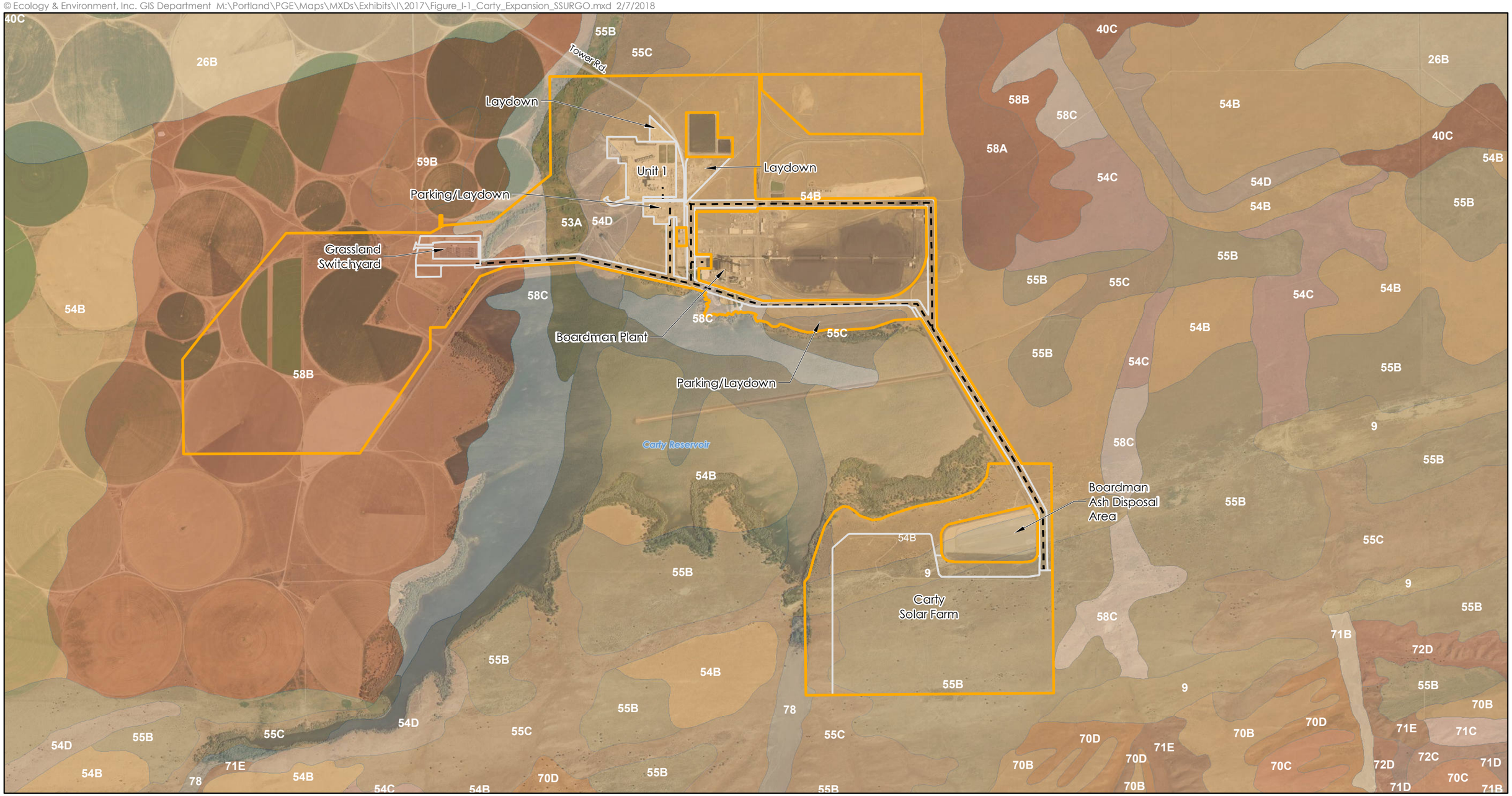
I.7 REFERENCES

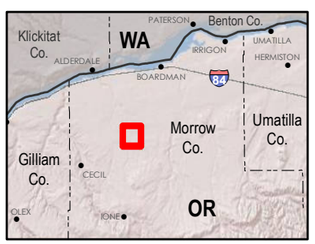
Hosler, Richard. 1983. Soil Survey of Morrow County Area. United States Department of Agriculture, Soil Conservation Service, in cooperation with the Oregon Agricultural Experiment Station. http://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/oregon/OR049/0/or049_text.pdf Accessed April, 6, 2016.

NRCS (Natural Resources Conservation Service). n.d.(a). Soil Survey Geographic (SSURGO) Database. United States Department of Agriculture. Available online at https://sdmdataaccess.sc.egov.usda.gov. Accessed February 1, 2018

———. n.d.(b). National Cooperative Soil Survey, Part 622. United States Department of Agriculture. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership/ncss/?cid=nrcs142p2_054226. Accessed February 1, 2018.

© Ecology & Environment, Inc. GIS Department M:\Portland\PGE\Maps\MXDs\Exhibits\I\2017\Figure_I-1_Carty_Expansion_SSURGO.mxd 2/7/2018





- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas

Soil Map Unts in the Study Area

- 53A: Royal silt loam, 0 to 3 percent slopes
- 54B: Sagehill fine sandy loam, 2 to 5 percent slopes
- 54D: Sagehill fine sandy loam, 12 to 20 percent slopes
- 55B: Sagehill fine sandy loam, hummocky, 2 to 5 percent slopes
- 55C: Sagehill fine sandy loam, hummocky, 5 to 12 percent slopes
- 58B: Taunton fine sandy loam, 2 to 5 percent slopes
- 58C: Taunton fine sandy loam, 5 to 12 percent slopes
- 78: Xeric Torriorthents, nearly level
- 9: Dune land

N

1:24,000

0 0.25 0.5 Miles

Credits: Copyright:© 2014 Esri
Esri, USDA Farm Service Agency

Figure I-1
Major Soil Types

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

Appendix I-1

1200-C Construction Stormwater Permit Application

Oregon
Kate Brown, Governor

Department of Environmental Quality
Eastern Region Bend Office
475 NE Bellevue Drive, Suite 110
Bend, OR 97701-7415
(541) 388-6146
Fax (541) 388-8283
TTY 711

December 19, 2016

Sarah Esterson
Energy Facility Siting Analyst
Oregon Department of Energy
625 Marion St. NE
Salem, OR 97301-3737

Re: Confirmation of Permit Application for Carty Generating Station Expansion
1200-C Construction Stormwater Permit
Gilliam and Morrow County

Dear Ms. Esterson:

On Aug. 26, 2016, the Department of Environmental Quality (DEQ) received a National Pollutant Discharge Elimination System (NPDES) 1200-C permit application for stormwater discharge from the proposed construction at Carty Generating Station Expansion project. The application was submitted to Jackie Ray, Permit Coordinator, in DEQ's Pendleton office. Payment for the permit application was processed for $1932.00.

Now that payment has been received, the permit application is complete with the exception of a site certification from the Oregon Department of Energy (ODOE) and submittal of a final Erosion and Sediment Control Plan (ESCP) after a few minor revision requests. The permit will be assigned once a final ESCP meets the permit requirements and pending the determination by the Energy Facility Siting Council Final Order.

Todd Hesse reviewed the submitted documents on October 27, 2016, and sent an email of acknowledgment on November 1, 2016. My colleague is assisting me in plan review while I am on a job rotation. I expect that DEQ will be able to issue the NPDES 1200-C construction stormwater permit for Carty Generating Station Expansion within 30 days of receiving the site certificate from ODOE and upon review of the final version of the ESCP.

Should you have any questions about the content of this letter, please contact me at 541-633-2033 or ratliff.krista@deq.state.or.us.

Sincerely,

Krista Ratliff
Natural Resource Specialist, Stormwater
DEQ - Eastern Region

ecc: Erica Amt, Environmental Specialist, PGE – Portland, OR

Enclosure: Todd Hesse, CWSRF Engineer, ODEQ – Bend office email dated Nov. 1, 2016

Portland General Electric Company
121 SW Salmon Street • Portland, Oregon 97204

August 24, 2016
Carty Generating Station
ES-221-2016

Ms. Jackie Ray
Oregon Department of Environmental Quality
Eastern Region
Permit Coordinator
700 SE Emigrant, Suite 330
Pendleton, OR 97801

Subject: Application for National Pollutant Discharge Elimination System 1200-C Permit, Carty Generating Station Expansion

Dear Ms. Ray:

Please find attached an application for a National Pollutant Discharge Elimination System (NPDES) 1200-C Permit. Portland General Electric Company (PGE) is applying for this permit as part of its Request for Amendment No.1 of the Carty Generating Station Site Certificate located in Morrow and Gilliam Counties, Oregon. The Carty Generating Station is subject to Energy Facility Siting Council (EFSC) jurisdiction and must obtain an amended site certificate from EFSC for proposed changes to the facility. However, the federally delegated NPDES 1200-C Permit is outside EFSC jurisdiction. The Carty Generating Station as currently approved by EFSC includes two natural gas-fueled generating units and related and supporting facilities; as amended it will include a total of three natural gas fueled generating units and a photovoltaic (PV) solar unit (referred to as the Carty Solar Farm) in addition to related and supporting facilities.

PGE currently holds an active NPDES 1200-C Permit for the construction of Unit 1 (File No. 123481). The enclosed application is intended to cover the future construction of the Carty Generating Station as amended. The proposed construction start date for future units of the Carty Generating Station is approximately 2018; therefore detailed construction plans are not yet available. The Erosion and Sediment Control Plan (ESCP) drawings associated with this permit application have been prepared based on the level of detail currently available. PGE recognizes that updated ESCP drawings may be required once detailed construction plans are available; and that a public notice and permit decision will not be made by DEQ until a construction start date is determined. The application is being submitted at this time to satisfy EFSC requirements to obtain a letter from DEQ stating that DEQ has received the preliminary application and, at the appropriate time, DEQ anticipates being able to issue permit coverage for the Carty Generating Station Expansion.

Enclosed you will find a completed application form, ESCP drawings, and application fee. I appreciate your consideration of this preliminary application. If you need additional information or have any questions do not hesitate to contact me at 503-464-2634.

Sincerely,

Lenna Cope

Lenna Cope
Environmental Engineer

C: Arya Behbehani, PGE

Enclosures (3)

DEQ USE ONLY

File #: _____

Application #: _____

LLID/RM: _____

River Mile: _____

Legal Name Confirmed: ☐

Notes: _____

DEPARTMENT OF ENVIRONMENTAL QUALITY
APPLICATION FOR NEW NPDES GENERAL PERMIT 1200-C

For stormwater discharges to surface waters from construction activities disturbing one acre or more that do not meet automatic coverage requirements.*

DEQ USE ONLY

Date Received: _____

Amount: $ _____

Check #: _____

Check Name: _____

Deposit #: _____

Receipt #: _____

Notes: _____

*A project *may* be eligible for "automatic coverage" under NPDES general permit 1200-CN if stormwater *does not* discharge to a waterbody with a TMDL or 303(d) listing for sediment or turbidity *and* it meets one of the following criteria (see 1200-CN at http://www.deq.state.or.us/wq/stormwater/docs/1200cnPermit.pdf:

1) Disturbs less than one acre and is located in Gresham, Troutdale, or Wood Village.
2) Disturbs less than five acres and is located in Albany, Corvallis, Eugene, Milwaukie, Multnomah Co. (unincorporated areas), Springfield, West Linn, or Wilsonville.
3) Disturbs less than five acres and is within the jurisdictions of Clackamas Co. Water Environment Services [Gladstone, areas within Clackamas Co. Service Dist. #1 (excluding Happy Valley), and areas within the Surface Water Management Agency of Clackamas Co. (including Rivergrove)], Clean Water Services (Banks, Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard, Tualatin, and Washington Co. within Urban Growth Boundary), or Rogue Valley Sewer Services.

A. PROJECT INFORMATION

1. Portland General Electric Company
Applicant (entity legally responsible for permit)

Lenna Cope
Contact Name (if different from applicant)

121 SW Salmon Street, 3WTC0403
Address

Portland | OR | 97204
City | State | Zip

503-464-2634 | lenna.cope@pgn.com
Telephone | E-Mail Address

2. Invoicing information (person or entity legally responsible for payment of annual fee invoice; not a third party independent of the applicant)

Same
Invoice Contact Name (if different from applicant)

_____
Address

_____ | _____ | _____
City | State | Zip

_____ | _____
Telephone | E-Mail Address

3. Sargent & Lundy
Architect/Engineering Firm (Erosion & Sediment Control Plan)

Darrel Packard
Project Manager

312-269-7305 | darrel.j.packard@sargentlundy.com
Telephone | E-Mail Address

4. To be determine and provided in Action Plan
Applicant's Designated Erosion and Sediment Control Inspector

_____
Company Name

_____ | _____
Telephone | E-Mail Address

_____
Qualification program and number (if applicable)
**required after January 1, 2017*

5. Carty Generating Station Expansion
Name of Project

73396 Tower Road
Address or Cross Street

Boardman | OR | 97818
City | State | Zip

Morrow County
County

6. Nature of Construction Activity
- ☐ Single Family (SIC Code 1521)
- ☐ Multi-Family Residential (SIC Code 1522)
- ☐ Commercial (SIC Code 1542)
- ☐ Industrial (SIC Code 1541)
- ☐ Highway (SIC Code 1611)
- ☐ Utilities (SIC Code 1623): _____
- ☐ Other (SIC Code required): _____

Army Corps No. (if any): _____

7. Approximate location of center of site

Latitude: 45.698176 Longitude: -119.813468

For assistance: DEQ Location Improvement Tool at: http://deqapp1/website/lit/data.asp

8. Approximate start date: 2018

a. Project Size
Total Site Acreage (acres): 446

Total Disturbed Area (acres): 659

Total Number of Lots: N/A

9. Are you aware of groundwater contamination located within the site boundary? ☐ YES ■ NO

Indicate if a dewatering plan or active treatment system O & M Plan is included (plan review fee may apply). ☐ YES ☐ NO

10. Receiving waterbody - Must identify final discharge location of construction stormwater flows.
- ☐ Infiltration device(s)
- ☒ Waters of the State (name or description): Sixmile Canyon Drainage, Willow Creek
- ☐ Ditch (downstream receiving waterbody):
- ☐ Municipal storm sewer or drainage system (downstream receiving waterbody):
- ☐ Other:

11. Stormwater runoff during construction discharges directly to or through a storm sewer or drainage system that discharges to a waterbody with a Total Maximum Daily Load (TMDL) **or** 303(d) listing for turbidity or sedimentation? ☐ YES ■ NO

For assistance: DEQ assessment database page at http://www.deq.state.or.us/wq/assessment/assessment.htm or DEQ Map/Table at http://deq12.deq.state.or.us/tmdl/default.aspx

B. LAND USE COMPATIBILITY STATEMENT

Provide the original completed Land Use Compatibility Statement (LUCS) signed by the local land use authority and findings if applicable. The application will be incomplete unless the local land use authority approves activities ensuring construction is consistent with local and statewide planning goals. LUCS is not required for a project under EFSC, per ORS469.378

A copy of this form may be found at http://www.deq.state.or.us/pubs/permithandbook/lucs.htm

C. SIGNATURE OF LEGALLY AUTHORIZED REPRESENTATIVE

The legally authorized representative *must* sign the application (see instructions – Section C).

I hereby certify that the information contained in this application is true and correct to the best of my knowledge and belief. In addition, I agree to pay all permit fees required by Oregon Administrative Rules 340-045. This includes a compliance determination fee invoiced annually by DEQ to maintain the permit.

ARYA BEHBEHANI — General Manager

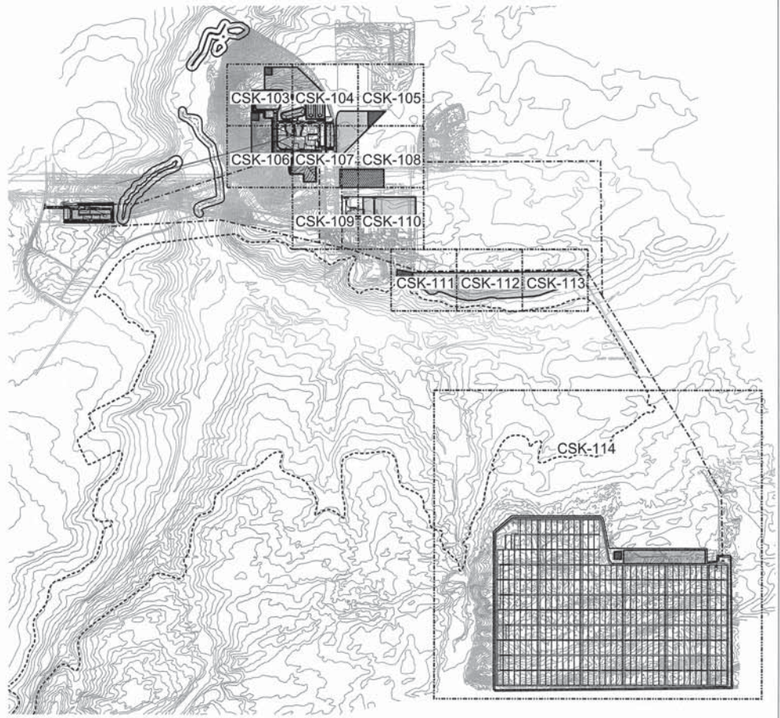
Name of Legally Authorized Representative (Type or Print) | **Title**

[signature] — 8/22/14

Signature of Legally Authorized Representative | **Date**

EROSION AND SEDIMENT CONTROL PLANS

KEY PLAN



DRAWING INDEX

EROSION AND SEDIMENT CONTROL PLANS

CSK-101 - EROSION CONTROL - SITE PLAN KEY PLAN AND NOTES
CSK-102 - EROSION CONTROL - SITE PLAN BMP MATRIX AND RATIONALE STATEMENT
CSK-103 - EROSION CONTROL - SITE PLAN SHEET 1
CSK-104 - EROSION CONTROL - SITE PLAN SHEET 2
CSK-105 - EROSION CONTROL - SITE PLAN SHEET 3
CSK-106 - EROSION CONTROL - SITE PLAN SHEET 4
CSK-107 - EROSION CONTROL - SITE PLAN SHEET 5
CSK-108 - EROSION CONTROL - SITE PLAN SHEET 6
CSK-109 - EROSION CONTROL - SITE PLAN SHEET 7
CSK-110 - EROSION CONTROL - SITE PLAN SHEET 8
CSK-111 - EROSION CONTROL - SITE PLAN SHEET 9
CSK-112 - EROSION CONTROL - SITE PLAN SHEET 10
CSK-113 - EROSION CONTROL - SITE PLAN SHEET 11
CSK-114 - EROSION CONTROL - SITE PLAN SHEET 12
CSK-115 - EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 1
CSK-116 - EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 2
CSK-117 - EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 3
CSK-118 - EROSION CONTROL - SITE PLAN CUT/FILL AREAS - PLAN SHEET 1
CSK-119 - EROSION CONTROL - SITE PLAN CUT/FILL AREAS - PLAN SHEET 2
CSK-120 - EROSION CONTROL - SITE PLAN CUT/FILL AREAS - PLAN SHEET 3
CSK-121 - EROSION CONTROL - SITE PLAN POST-CONSTRUCTION DRAINAGE SHEET 1
CSK-122 - EROSION CONTROL - SITE PLAN POST-CONSTRUCTION DRAINAGE SHEET 2
CSK-123 - EROSION CONTROL - SITE PLAN POST-CONSTRUCTION DRAINAGE SHEET 3
CSK-124 - EROSION CONTROL - SITE PLAN OVERALL PLANT SITE-PLAN SHEET 1
CSK-125 - EROSION CONTROL - SITE PLAN OVERALL PLANT SITE-PLAN SHEET 2
CSK-126 - EROSION CONTROL - SITE PLAN OVERALL PLANT SITE PLAN SHEET 3
CSK-127 - EROSION CONTROL - SITE PLAN SECTIONS AND DETAILS

PROJECT LOCATION

THE GENERATING FACILITY IS LOCATED IN MORROW COUNTY, APPROXIMATELY 13 MILES SOUTHWEST OF BOARDMAN, OREGON. THE ASSOCIATED TRANSMISSION LINE IS LOCATED IN MORROW AND GILLIAM COUNTIES AND EXTENDS APPROXIMATELY 18 MILES WEST FROM THE GENERATING FACILITY.

GENERATING FACILITY
LATITUDE: 45° 42' NORTH LONGITUDE: 119° 49' WEST

PROPERTY DESCRIPTION

THE GENERATING FACILITY IS LOCATED NORTH AND SOUTH OF CARTY RESERVOIR; SECTIONS 32, 33, 34 AND 35, TOWNSHIP 3 NORTH, RANGE 24 EAST, WILLAMETTE MERIDIAN. THE SOLAR FARM IS LOCATED IN SECTIONS 2, 3, 10, AND 11 OF TOWNSHIP 2 NORTH, RANGE 24 EAST, WILLIAMETTE MERIDIAN.

ATTENTION EXCAVATOR:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION, CALL 503-246-6699.

SEEDS MIX:

	PLS lbs/		
Scientific Name	Acre1,2	Description/ Purpose	Common Name
Pseudoregneria spicata	6	(N) (EC) (F)	Secar bluebunch wheatgrass
Poa ampla	1.5	(N) (F)	Sherman big bluegrass
Medicago sativa	1	(I) (F)	Ladak alfalfa
Sanguisorba minor	2	(I) (F)	Small burnet
Elymus cinereus	1	(N) (EC) (F)	Great Basin wildrye *
Hesperostipa comata	1	(N) (EC) (F)	Needle and thread grass*
Achillea millefolium var. oc	1	(N) (F)	Western yarrow *
Artemisia tridentata	1	(N) (F)	Big sagebrush *

(N) = Native, (I) = Introduced, (EC) = Erosion Control, (F) = Forage
* Optional species depending on site and availability
1 PLS= pure live seed
2 Final lbs/acre may change at the request of the landowner or ODFW

TRANSMISSION TOWER EROSION CONTROL:

PROPOSED TRANSMISSION TOWER LOCATIONS ARE NOT SHOWN. THE TOWERS WILL BE SHOWN IN THE EROSION CONTROL PLANS ONCE THEIR LOCATIONS ARE FINALIZED. APPROPRIATE BMP'S SUCH AS SILT FENCE, ETC. WILL BE INSTALLED AROUND THE TOWER FOR SEDIMENT CONTROL. IF ANY TRANSMISSION TOWERS ARE SITED WITHIN 50 FEET OF A WATER OF THE STATE, THE NATURAL BUFFER WILL BE PROTECTED OR INCREASED BMPs WILL BE IMPLEMENTED PER SCHEDULE A.7.b.

WIND EROSION CONTROL:

WIND EROSION CONTROL MEASURES WILL BE APPLIED CORRECTLY THROUGHOUT THE SITE IN ACCORDANCE WITH THE DEQ REQUIREMENTS. CONTRACTOR TO CHECK WITH ENGINEER TO ASCERTAIN WHICH METHODS ARE APPROPRIATE FOR THE SITE.

APPLICANT

Portland General Electric Company
Contact: Lenna Cope, PGE
121 SW Salmon St.
Portland, OR. 97204
Phone: 503.464.2634

DEVELOPER

Portland General Electric Company
Contact: (TBD)
121 SW Salmon Street 3WTC-BR05
Portland, OR 97204
Phone: (TBD)
Email: (TBD)

NARRATIVE DESCRIPTION

EXISTING SITE CONDITIONS
- MIX OF DEVELOPED GENERATION FACILITIES AND UNDEVELOPED ARID TERRAIN OR FARMLAND. THE SITE IS RELATIVELY FLAT AND SLOPES TO THE WEST - NORTHWEST WITH ELEVATIONS RANGING FROM 670 TO 760. GROUND COVER INCLUDES SAND, SCATTERED GRASS AND SAGE BUSHES.

DEVELOPED SITE CONDITIONS
- NATURAL GAS FUEL GENERATING FACILITY AND SOLAR FARM WITH ASSOCIATED SWITCHYARD, COOLING TOWER, WASTE WATER HOLDING PONDS, STORMWATER RETENTION SWALES AND CONSTRUCTION LAYDOWN AREA. PROPOSED GROUND COVER INCLUDES, GRAVEL, ASPHALT ROADS AND GRASS.

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE
- SITE CLEARING: (TBD)
- SOIL REMEDIATION: (TBD)
- INITIAL GRADING: (TBD)
- FOUNDATION AND UNDERGROUND UTILITY INSTALLATION: (TBD)
- GENERATING FACILITY CONSTRUCTION: (TBD)
- PAVING AND FINAL STABILIZATION: (TBD)

GENERATING FACILITY
ENERGY GENERATING FACILITY DISTURBED AREA = 414 ACRES PERMANENT, 132 ADDITIONAL ACRES TEMPORARY
GRASSLAND SWITCHYARD DISTURBED AREA = 20 ACRES PERMANENT, 3 ADDITIONAL ACRES TEMPORARY
TRANSMISSION LINES DISTURBED AREA = 12 ACRES PERMANENT, 78 ADDITIONAL ACRES TEMPORARY

SITE SOIL CLASSIFICATIONS

SOIL PHASE NUMBER	SOIL PHASES	EROSION POTENTIAL
13	KIMBERLY FINE SANDY LOAM	SLIGHT
14B	KREBS SILT LOAM, 2 TO 5 PERCENT SLOPES	SLIGHT
14D	KREBS SILT LOAM, 5 TO 20 PERCENT SLOPES	SLIGHT
15E	LICKSKILLET VERY STONY LOAM, 7 TO 40 PERCENT SLOPES	HIGH
23B	OLEX SILT LOAM, 0 TO 5 PERCENT SLOPES	SLIGHT
24D	OLEX GRAVITY SILT LOAM, 5 TO 20 PERCENT SLOPES	MODERATE
24E	OLEX GRAVITY SILT LOAM, 20 TO 40 PERCENT SLOPES	HIGH
40B	SAGEHILL FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	SLIGHT
40C	SAGEHILL FINE SANDY LOAM, 5 TO 12 PERCENT SLOPES	SLIGHT
40D	SAGEHILL FINE SANDY LOAM, 12 TO 20 PERCENT SLOPES	SLIGHT
41B	SAGEHILL FINE SANDY LOAM, HUMMOCKY, 2 TO 5 PERCENT SLOPES	SLIGHT
41C	SAGEHILL FINE SANDY LOAM, HUMMOCKY, 5 TO 12 PERCENT SLOPES	MODERATE
4C	BLALOCK LOAM, 2 TO 12 PERCENT SLOPES	SLIGHT
53A	ROYAL SILT LOAM, 0 TO 3 PERCENT SLOPES	SLIGHT
54B	SAGEHILL FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	SLIGHT
54C	SAGEHILL FINE SANDY LOAM, 5 TO 12 PERCENT SLOPES	SLIGHT
54D	SAGEHILL FINE SANDY LOAM, 12 TO 20 PERCENT SLOPES	SLIGHT
55B GILLMAN	WARDEN SILT LOAM, 2 TO 5 PERCENT SLOPES	SLIGHT
55B MORROW	SAGEHILL FINE SANDY LOAM, HUMMOCKY, 2 TO 5 PERCENT SLOPES	SLIGHT
55C	SAGEHILL FINE SANDY LOAM, HUMMOCKY, 5 TO 12 PERCENT SLOPES	MODERATE
55D	WARDEN SILT LOAM, 2 TO 5 PERCENT SLOPES	SLIGHT
56B	WILLIS SILT LOAM, 2 TO 5 PERCENT SLOPES	MODERATE
58B	TAUNTON FINE SANDY LOAM, 2 TO 5 PERCENT SLOPES	MODERATE
58C	TAUNTON FINE SANDY LOAM, 5 TO 12 PERCENT SLOPES	MODERATE

ALL FILL MATERIAL WILL BE GENERATED ONSITE FROM GRADING ACTIVITIES.

RECEIVING WATER BODIES
LOCAL NON-JURISDICTIONAL WETLANDS

100-YEAR FLOOD PLAIN
BASED ON REVIEW OF FEMA FLOOD INSURANCE RATE MAPS (FIRMS) 41049C0250D; FACILITIES AND CONSTRUCTION AREA WILL NOT BE LOCATED WITHIN THE 100-YEAR FLOOD ZONE.

APPLICANT SITE INSPECTOR

NAME: (TBD)
ADDRESS: (TBD)
TELEPHONE: (TBD)
EMAIL: (TBD)
TRAINING: (TBD)
EXPERIENCE: (TBD)

THE SITE INSPECTOR HAS NOT YET BEEN ASSIGNED. WHEN SITE INSPECTOR HAS BEEN SELECTED, INSPECTOR CONTACT INFORMATION, TRAINING, AND EXPERIENCE WILL BE SUBMITTED TO DEQ, IN AN ACTION PLAN, AT A LATER DATE.

INSPECTION FREQUENCY

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOWMELT IS OCCURRING, AT LEASE EVERY 14 DAYS, REGARDLESS OF WHETHER STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER, ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH
4. PERIODS DURING WHICH THE SITE INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MAY OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY, RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGE LIKELY.

- HOLD A PRE-CON MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE EC INSPECTOR.
- ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS.
- INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS.
- REVISIONS TO THE APPROVED ESC PLAN MUST BE SUBMITTED TO DEQ OR AGENT IN ACCORDANCE WITH CURRENT 1200-C PERMIT.

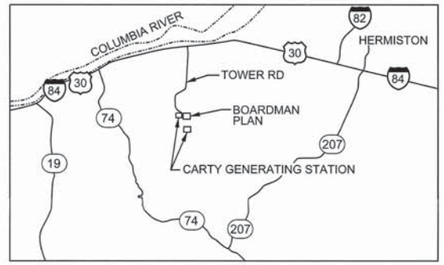
CONCRETE WASHOUT:

HAY BALE AND PLASTIC WASHOUT PIT SHALL BE INSTALLED AT THE SITE AS SHOWN IN DETAIL CSK-102-02.

THE CONTRACTOR IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200-C PERMIT. THIS EROSION AND SEDIMENT CONTROL PLAN (ESCP) AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200-C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200-C PERMIT REQUIREMENTS SUPERSEDE REQUIREMENTS OF THIS PLAN.

GENERAL EROSION AND SEDIMENT CONTROL PLAN (ESCP) DRAWING NOTES

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.i.(3))
2. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE B.1.C AND B.2)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS. THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
5. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A 8.A)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.I)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.IV. AND V)
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION. (SCHEDULE A.7.A.III)
9. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.i.(1) AND (2))
10. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.V)
11. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FEET OF WATERS OF THE STATE. (SCHEDULE A.7.B.I.AND (2)A)(B))
12. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.i.(5))
13. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
14. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.I)
15. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.i.(6))
16. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATIONS MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS. (SCHEDULE A.8.C.II.(3))
17. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.i.(7))
18. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A.7.D.II AND A.8.C.i(4))
19. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(5))
20. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEANOUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
21. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY; AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
22. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A.7.E.III.)
23. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A.7.A.IV)
24. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.III)
25. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
26. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A.7.B)
27. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A7.E.II.(2))
28. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A.7.A.I)
29. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL.(SCHEDULE A.9.C.I)
30. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SCHEDULE A.9.C.I)
31. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.III & IV)
32. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME. (SCHEDULE A.9.B.I)
33. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS. (SCHEDULE A.9.B.II)
34. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
35. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
36. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.III(1) AND D.3.C.II AND III)



NORTH

SITE ACCESS MAP

FOR PERMIT ONLY

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	08-17-2016	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -

DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: NONE	CAD FILE NAME: CSK-101.DGN	

REF_DWG(S): REF_DWG

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
KEY PLAN AND NOTES

DRAWING NO.:	SHEET NO.:	REV. NO:
CSK-101	1	0

REGISTERED PROFESSIONAL ENGINEER 88402 PE OREGON SEP. 10, 2013 JOSEPH F. PETRO

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

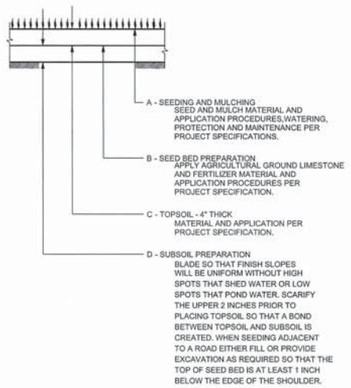
EROSION AND SEDIMENT CONTROL PLANS

BMP MATRIX AND RATIONALE STATEMENT

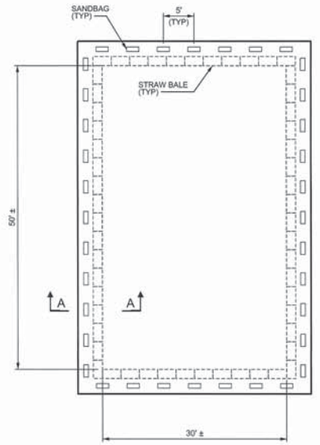
BMP	CONSTRUCTION PHASE				
	PRE-EARTHWORK ACTIVITIES	CLEARING AND GRADING	BUILDING AND EQUIPMENT CONSTRUCTION	CLEAN-UP AND RESTORATION	WET WEATHER
EROSION PREVENTION					
EP-1 SCHEDULING	X	X	X	X	X
EP-4 TOPSOILING		X		X	
EP-2 PRESERVE NATURAL VEGETATION	X	X	X	X	X
EP-6 PERMANENT SEEDING				X	
EP-8 MULCHES				X	X
EP-10 EROSION CONTROL BLANKETS		X	X	X	X
EP-13 DUST CONTROL		X	X	X	
SEDIMENT CONTROL					
SC-1 SEDIMENT FENCE	X	X	X	X	X
SC-6 COMPOST SOCK		X	X	X	X
SC-10 ENTRANCE/EXIT TRACKING CONTROLS	X	X	X	X	X
DITCH CHECKS		X	X	X	X
RUN-OFF CONTROL					
RC-2 ENERGY DISSIPATERS		X	X	X	X
POLLUTION PREVENTION					
NS-2 PAVING OPERATION CONTROLS	X	X	X	X	
NS-4 ILLICIT CONNECTION/ILLEGAL DISCHARGE	X	X	X	X	
NS-5 VEHICLE AND EQUIPMENT CLEANING	X	X	X	X	
NS-6 VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE	X	X	X	X	
NS-7 MATERIAL DELIVERY AND STORAGE CONTROLS	X	X	X	X	
NS-8 MATERIAL USE	X	X	X	X	
NS-9 STOCKPILE MANAGEMENT		X	X	X	
NS10 SPILL PREVENTION AND CONTROL PROCEDURES	X	X	X	X	
NS-11 SOLID WASTE MANAGEMENT	X	X	X	X	
NS-12 HAZARDOUS MATERIALS AND WASTE MANAGEMENT	X	X	X	X	
NS-13 CONTAMINATED SOIL MANAGEMENT		X	X	X	
NS-14 CONCRETE MANAGEMENT		X	X	X	
NS-15 SANITARY WASTE MANAGEMENT	X	X	X	X	
NS-17 TRAINING AND SIGNAGE	X	X	X	X	

FOR APPROXIMATE WORK TIME FRAME FOR BMP MATRIX, REFERENCE THE NARRATIVE DESCRIPTION SECTION - NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE.

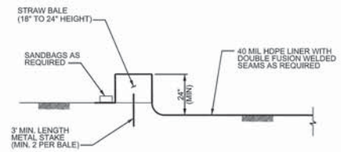
A COMPREHENSIVE LIST OF AVAILABLE BMP OPTIONS, BASED ON DEQ'S 1200-C PERMIT APPLICATION AND ESCP GUIDANCE DOCUMENT, HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN (ESCP). SOME OF THE ABOVE MENTIONED BMPS WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITION, TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS. AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESCP, AN ACTION PLAN WILL BE SUBMITTED.
INITIAL: AGP DATE: AUGUST 17, 2016



GRASS SEEDING ON TOPSOIL
DETAIL CSK-102-01
N.T.S.



PLAN



SECTION A

NOTE:

WASHOUT PIT SHALL BE CLEANED AS REQUIRED TO PREVENT OVERFLOW OF WASHOUT WATER AND DAMAGE TO THE HAY BALE CURBING. WASHOUT WATER SHALL BE VACUUMED OFF AND REMAINING SOLIDS SHALL BE REMOVED FROM THE PIT FOR OFFSITE DISPOSAL. IF THE PIT IS DAMAGED DURING CLEANING, IT SHALL BE REPAIRED BY RE-LINING THE PIT AND REPLACING THE DAMAGED HAY BALE. THE HARDENED SOLIDS SHALL BE REMOVED FOR RECYCLING OR SENT OUT TO LANDFILL IF THEY BOUND UP WITH THE LINER.

TEMPORARY CONCRETE WASHOUT
DETAIL CSK-102-02
N.T.S.

FOR PERMIT ONLY

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	08-17-2016	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -

DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: NONE	CAD FILE NAME: CSK-102.DGN	
REF. DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

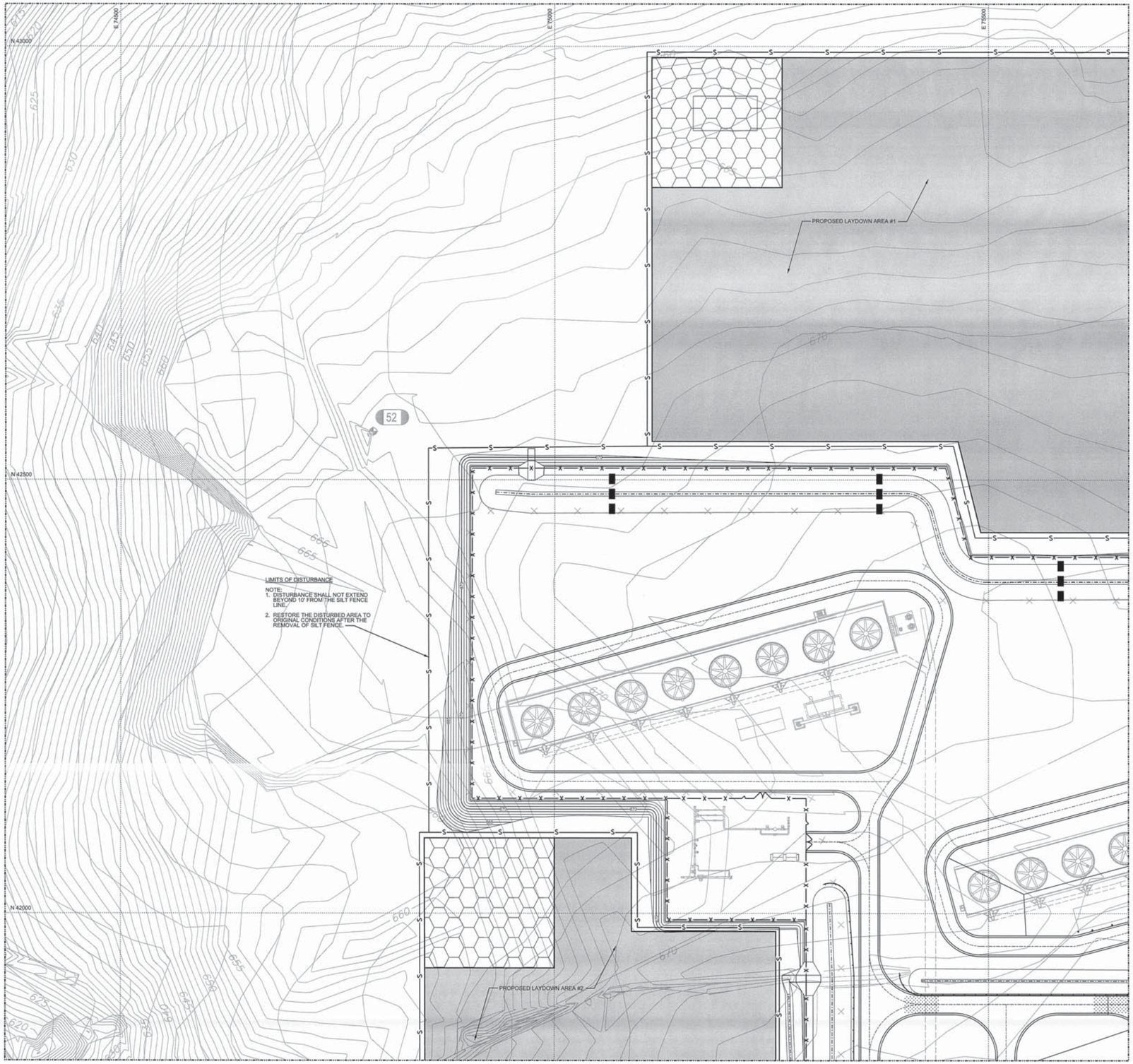
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
BMP MATRIX AND RATIONALE STATEMENT

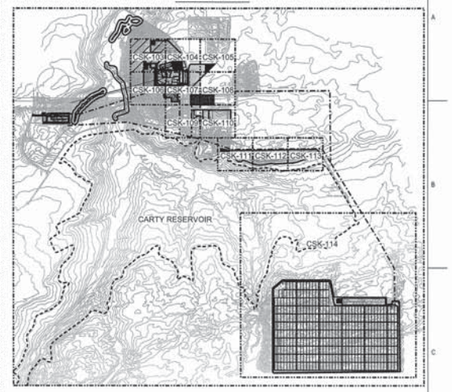
DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-102	1	0

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
SEP. 10, 2015
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.



KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRAVEL ROAD SURFACING
- GRASS SEEDING
- —S——S— SILT FENCE
- SOIL STORAGE/SPOIL AREA
- DITCH CHECKS

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000,000.IS EQUAL TO N 40,000.000, E 77,000.00000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -

DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"=40'	CAD FILE NAME: CSK-103.DGN	
REF_DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN SHEET 1

REGISTERED PROFESSIONAL ENGINEER
86402 PE
OREGON
Sept. 10, 2003
JOSEPH T. PETERS
RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

DRAWING NO.: CSK-103 | SHEET NO.: 1 | REV. NO.: 0

E 76000

E 76500

N 43000

N 42500

N 42000

665

670

PROPOSED LAYDOWN AREA #1

51

STONE CONSTRUCTION ENTRANCE (DETAIL CSK-127-03)

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

WASTE WATER HOLDING POND

WASTE WATER HOLDING POND

EXISTING SITE ROAD

PROPOSED LAYDOWN AREA #3

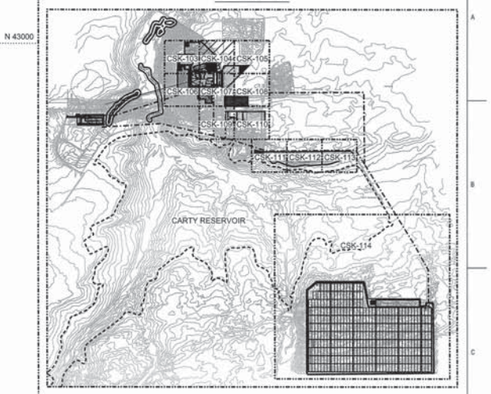
PROPOSED LAYDOWN AREA #2

MATCHLINE DRAWING CSK-103

MATCHLINE DRAWING CSK-105

MATCHLINE DRAWING CSK-107

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRAVEL ROAD SURFACING
- CONCRETE SURFACING
- CONSTRUCTION ENTRANCE
- GRASS SEEDING
- S — S — SILT FENCE
- DITCH CHECKS

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-104.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN SHEET 2

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-104	1	0

REGISTERED PROFESSIONAL ENGINEER
89403 PE
OREGON
DEC. 31, 2018
JOSEPH T. PETERS

RENEWS: DEC. 31, 2018

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

E.77000

E.77500

E.78000

N 43000

N 42500

N 42000

665

665

MATCHLINE DRAWING CSK-104

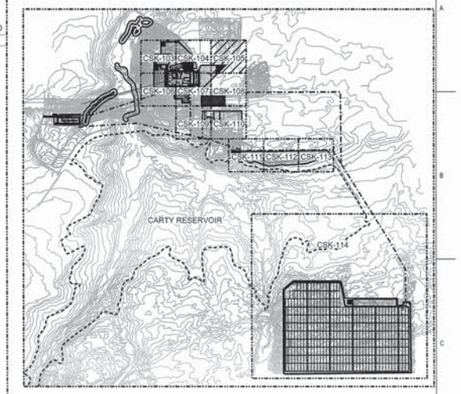
MATCHLINE DRAWING CSK-108

PROPOSED LAYDOWN AREA #3

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRAVEL ROAD SURFACING
- CONCRETE SURFACING
- CONSTRUCTION ENTRANCE
- GRASS SEEDING
- S——S SILT FENCE
- DITCH CHECKS
- SOIL STORAGE/SPOIL AREA

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	09/01/2016	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-105.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 3

DRAWING NO.:	SHEET NO.:	REV NO.:
CSK-105	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
86402 PE
OREGON
SEPT. 10, 2015
JOSEPH F. PETER

RENEWS: DEC. 31, 2016

MATCHLINE DRAWING CSK-103

MATCHLINE DRAWING CSK-107

PROPOSED LAYDOWN AREA #2

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

STONE CONSTRUCTION ENTRANCE (DETAIL CSK-127-03)

PROPOSED

EXISTING SITE ROAD

CL TRANSMISSION CORRIDOR

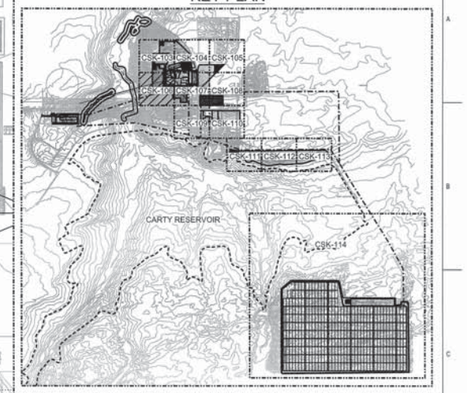
PROPOSED LAYDOWN AREA #3

EXISTING

EXISTING 345kV POLE

N 41500
N 41000
E 74500
E 75000
E 75500

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES

TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000,000 IS EQUAL TO N 40,000,000, E 77,000,0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-106.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 4

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-106	1	0

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
SEPT. 10, 2015
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL OR THAT OF ITS SUBCONTRACTOR(S) PERFORMING THE WORK.

MATCHLINE DRAWING CSK-104

MATCHLINE DRAWING CSK-106

MATCHLINE DRAWING CSK-108

MATCHLINE DRAWING CSK-109

PROPOSED LAYDOWN AREA #9

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

PROPOSED LAYDOWN AREA #3

STONE CONSTRUCTION ENTRANCE (DETAIL CSK-127-03)

CL TRANSMISSION CORRIDOR

CL TRANSMISSION CORRIDOR (TYP)

PROPOSED LAYDOWN AREA #8

PROPOSED PARKING AREA #4

Rail Road Tracks

EXIST. DIT

GATEHOUSE A

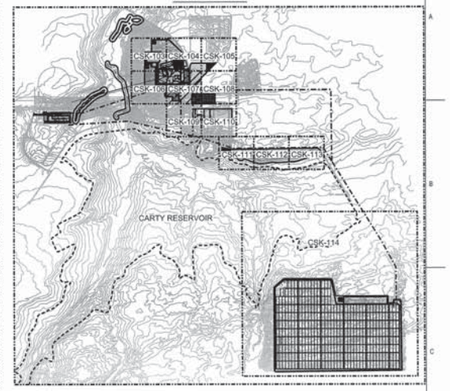
N 41500

N 41000

E 76000

E 76500

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- S S — SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION
- CONSTRUCTION PARKING

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG/MGR
0	08-17-2016	ISSUED FOR PERMIT	KP	-	MET	- DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -

DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-107.DGN	

REF_DWG(S): REF_DWG

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 5

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-107	1	0

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
Sept. 10, 2013
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

MATCHLINE DRAWING CSK-105

MATCHLINE DRAWING CSK-107

MATCHLINE DRAWING CSK-110

PROPOSED LAYDOWN AREA #3

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

PROPOSED PARKING AREA #4

CL TRANSMISSION CORRIDOR

RAILROAD GRADE

Rail Road Tracks

SAGEBRUSH AND SAND

EL 68' CMP SS

EL 67' CMP SS

SSMH #8 RIM = 669.94

WAREHOUSE NO. 3

WAREHOUSE NO. 4

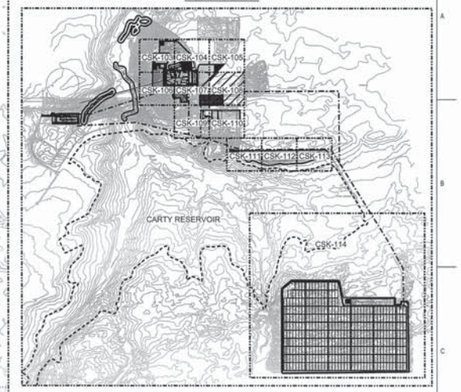
N 41500

N 41000

E 77500

E 78000

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES

TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- —S——S— SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION
- CONSTRUCTION PARKING
- SOIL STORAGE/SPOIL AREA

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -

DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-108.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

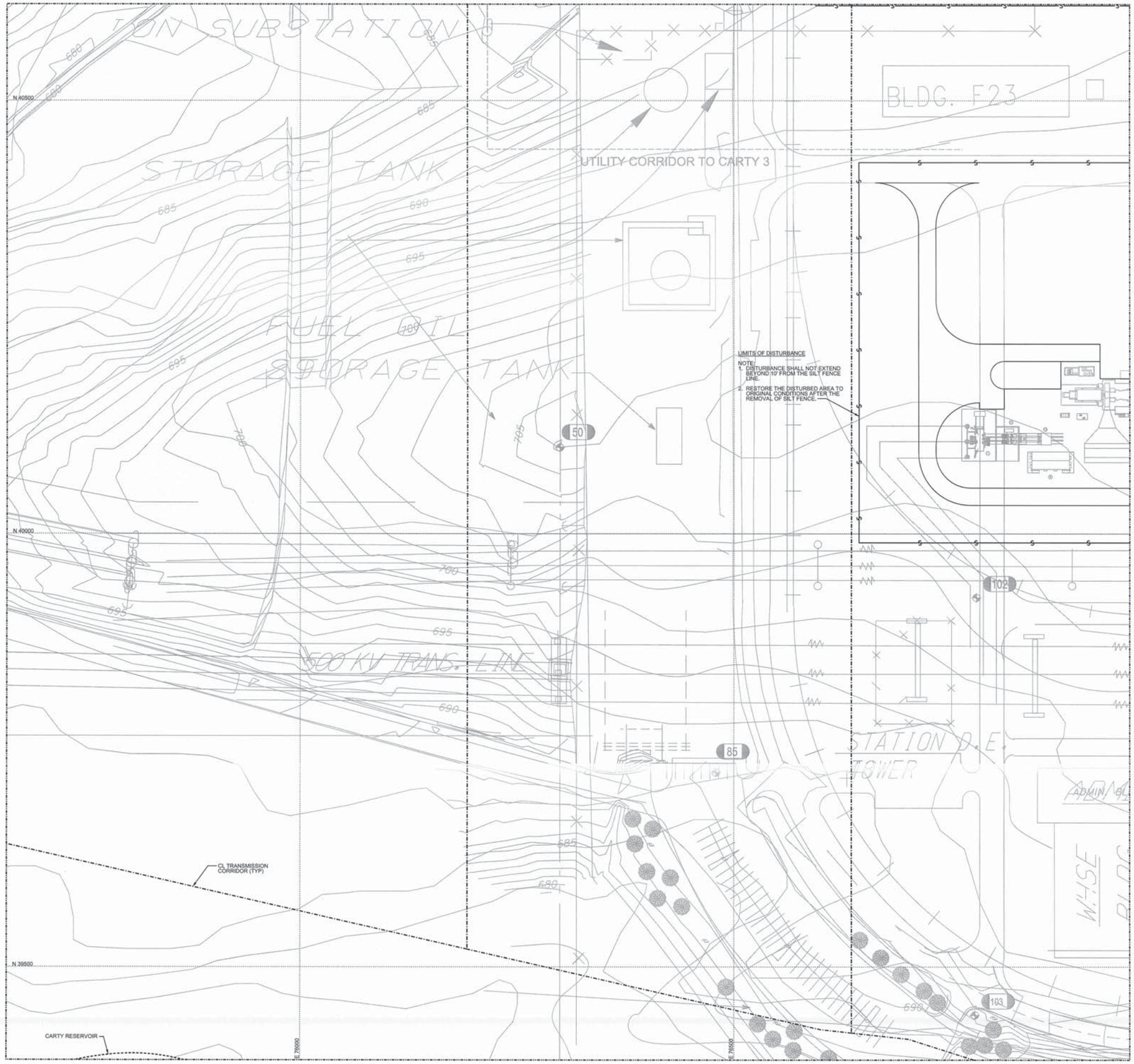
EROSION CONTROL - SITE PLAN
SHEET 6

DRAWING NO.:	SHEET NO.:	REV NO.:
CSK-108	1	0

REGISTERED PROFESSIONAL ENGINEER
86402PE
OREGON
RENEWS: DEC. 31, 2016

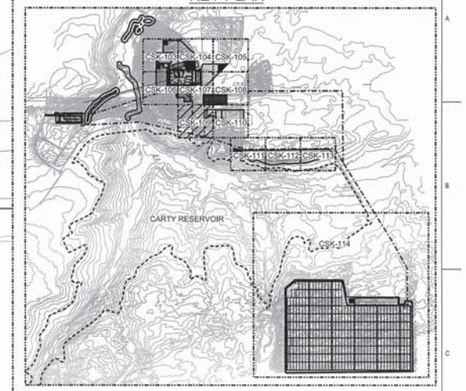
CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

MATCHLINE DRAWING CSK-107



MATCHLINE DRAWING CSK-110

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- S S — SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT = N 740,000.0000, E 1,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED -0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 06-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-109.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 7

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-109	1	0

REGISTERED PROFESSIONAL ENGINEER
55402 PE
OREGON
SEP. 15, 2015
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

MATCHLINE DRAWING CSK-108

MATCHLINE DRAWING CSK-109

MATCHLINE DRAWING CSK-111

N 40500

N 40000

N 39500

E 77500

E 78000

STONE CONSTRUCTION ENTRANCE (DETAIL CSK-127-03)

STONE CONSTRUCTION ENTRANCE (DETAIL CSK-127-03)

PROPOSED LAYDOWN AREA #5

LIMITS OF DISTURBANCE

NOTE:
1. DISTURBANCE SHALL NOT EXTEND BEYOND 10' FROM THE SILT FENCE LINE.
2. RESTORE THE DISTURBED AREA TO ORIGINAL CONDITIONS AFTER THE REMOVAL OF SILT FENCE.

Power Block

E.S.P.

CHIMNEY

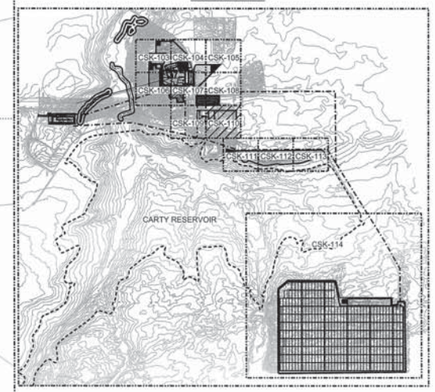
ASH SILOS

CONDENSTATE TANKS

WASTE STORAGE SHED

WAREHOUSE 5

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- —S——S— SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT: N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	- DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-110.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 8

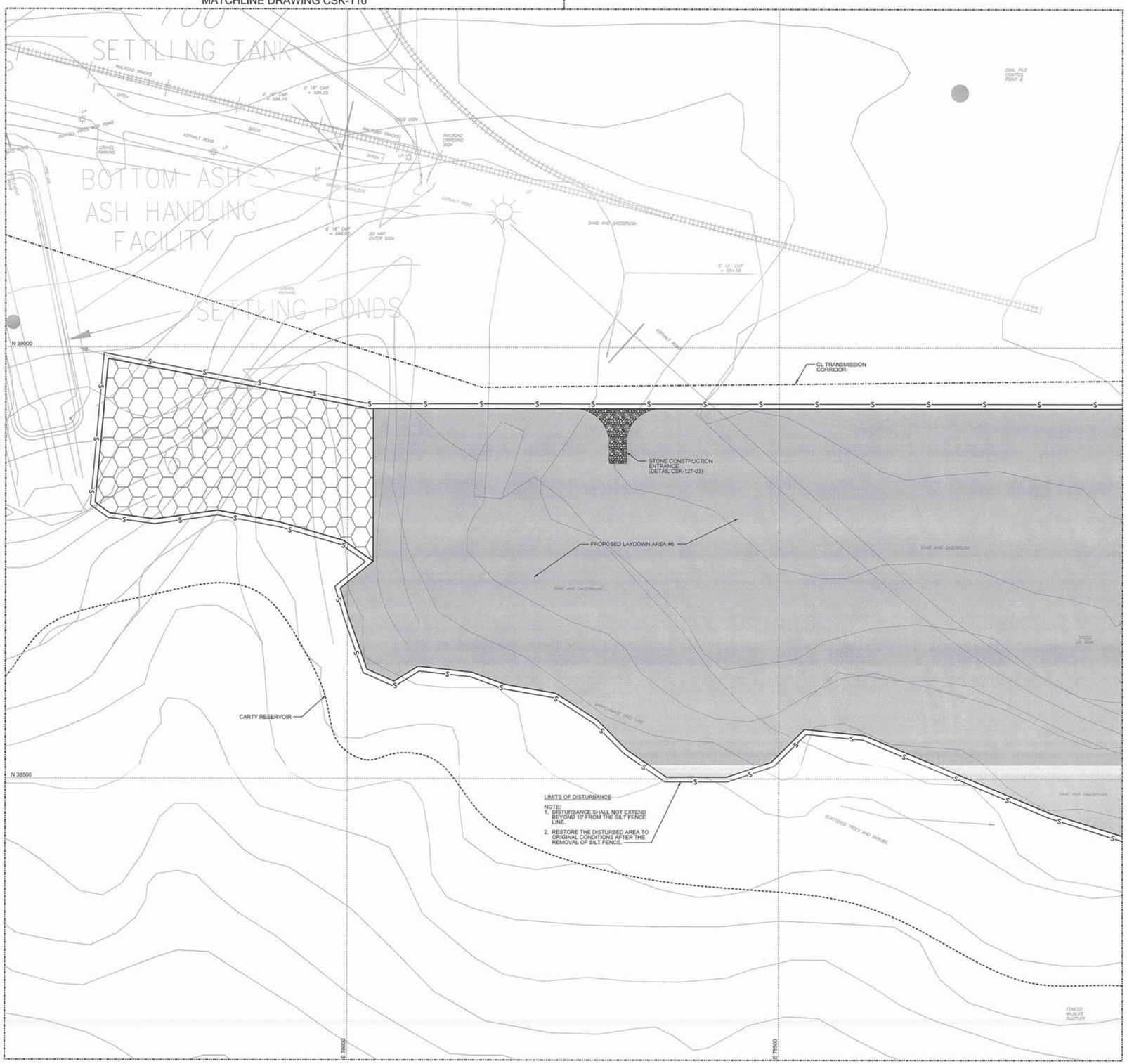
DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-110	1	0

REGISTERED PROFESSIONAL ENGINEER
88402PE
OREGON
DEC. 10, 2013
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

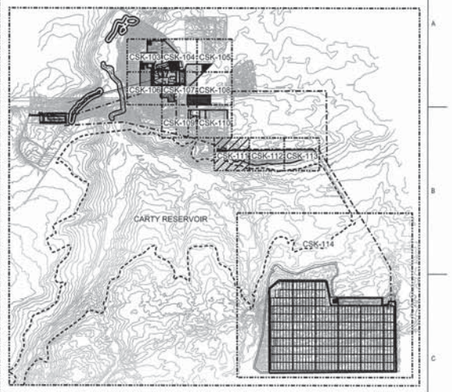
CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

MATCHLINE DRAWING CSK-110



MATCHLINE DRAWING CSK-112

KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- S——S — SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION
- SOIL STORAGE/SPOIL AREA

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000,000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/26	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-111.DGN	
REF_DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

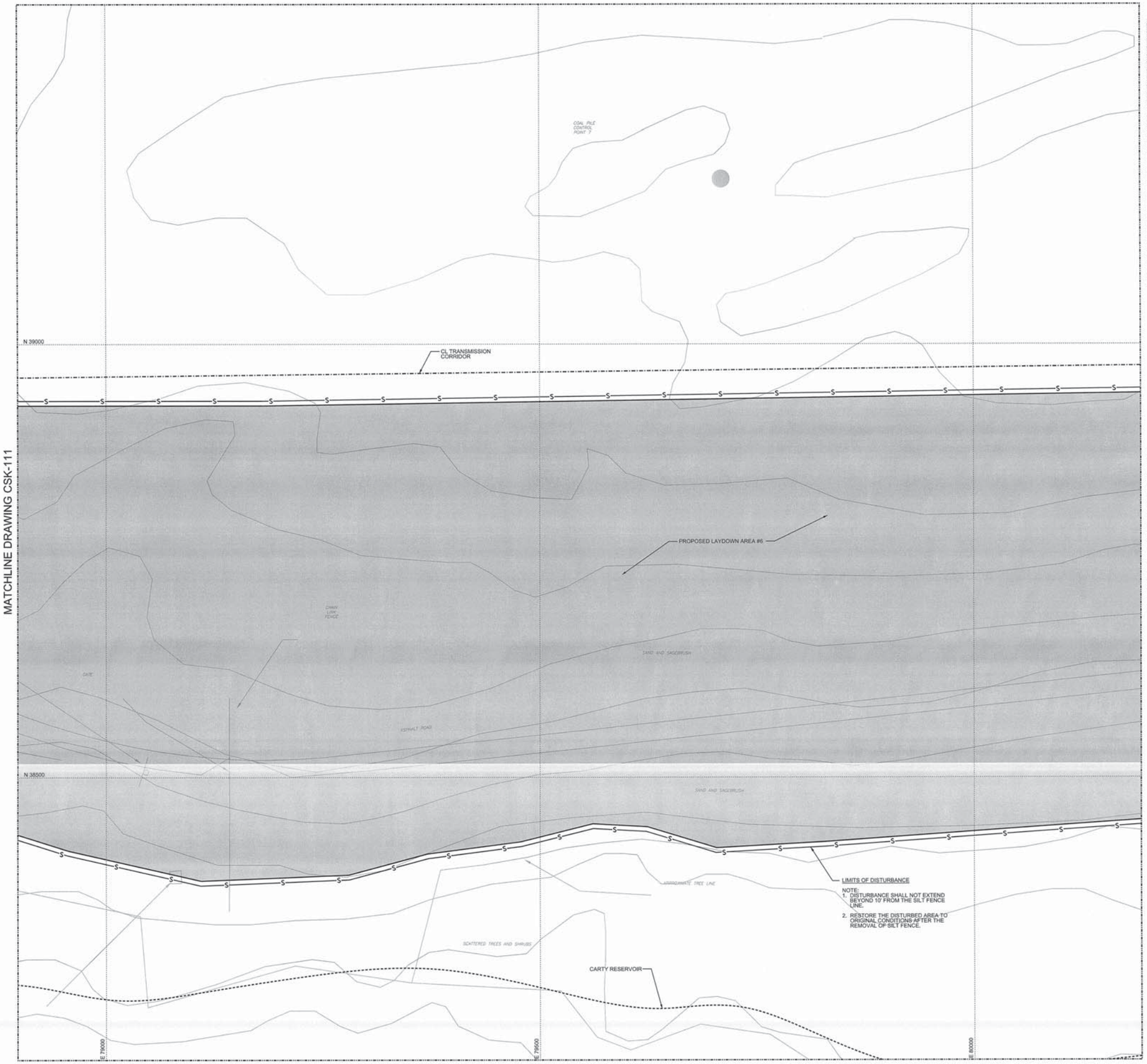
EROSION CONTROL - SITE PLAN
SHEET 9

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-111	1	0

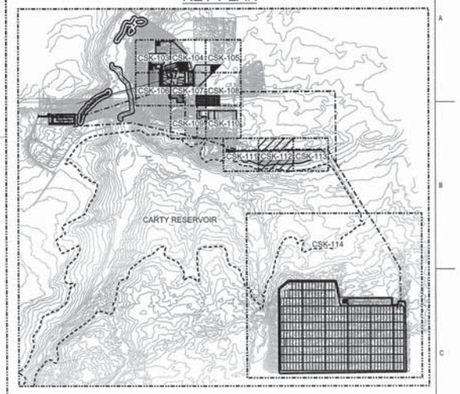
REGISTERED PROFESSIONAL ENGINEER
98402 PE
OREGON
SEPT. 10, 2013
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.



KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- S — S — SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/26	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-112.DGN	
REF. DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

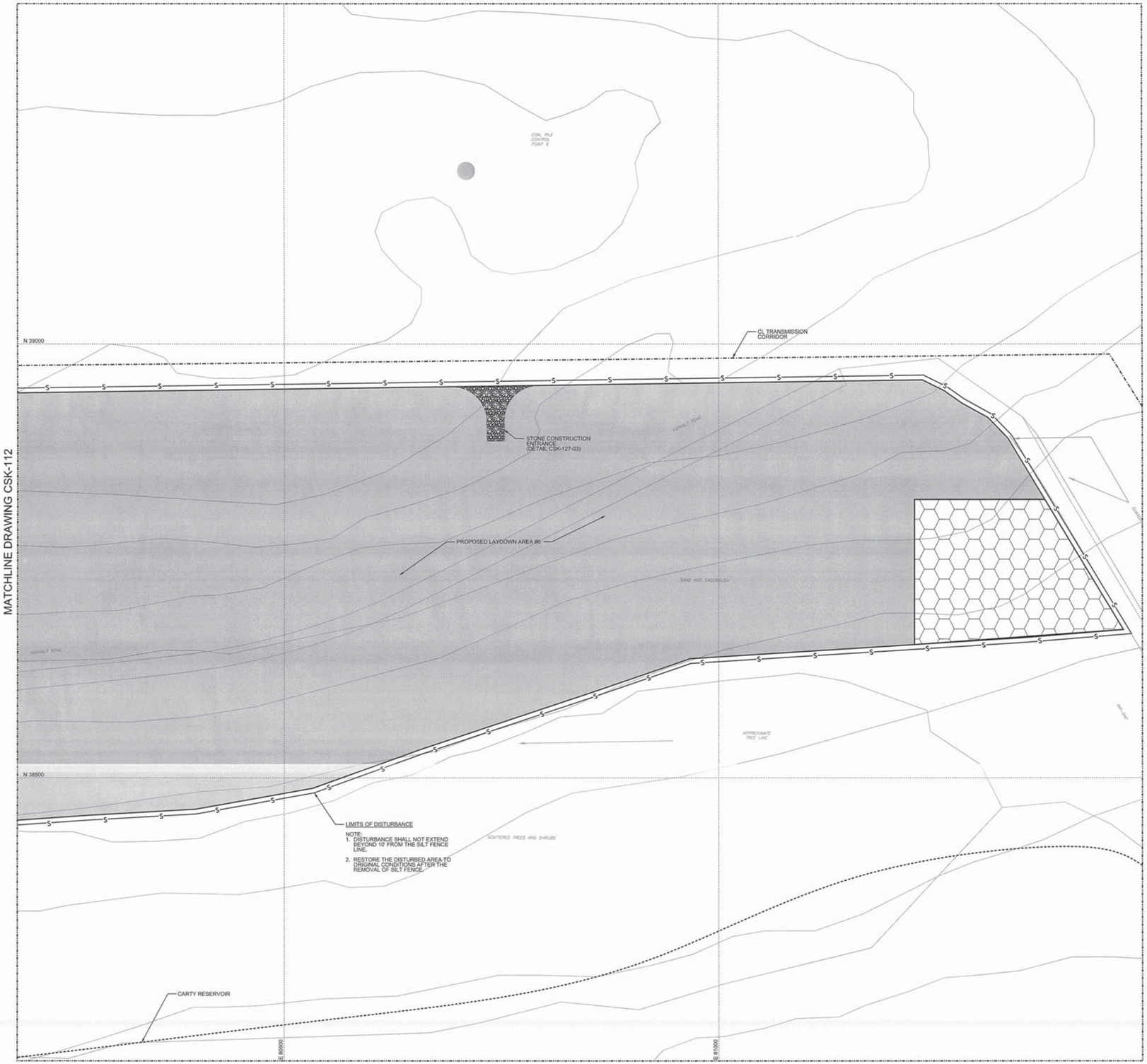
EROSION CONTROL - SITE PLAN
SHEET 10

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-112	1	0

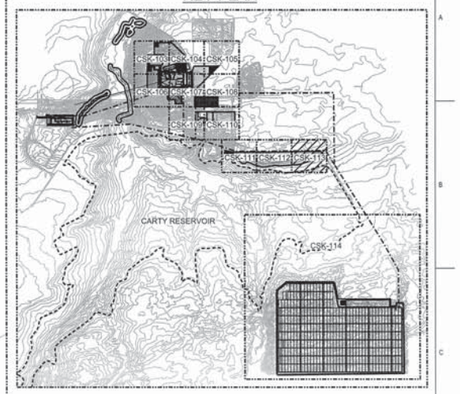
CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
OREGON
88403 PE
SEPT. 10, 2015
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016



KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES

TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 40' 80' 120' 160'

GRAPHIC SCALE
DRAWING SCALE
1"=40'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ASPHALT SURFACING
- AGGREGATE SURFACING
- GRASS SEEDING
- S — S — SILT FENCE
- DITCH CHECKS
- SLOPE IN PLAN
- CULVERT WITH FLARED END SECTION
- SOIL STORAGE/SPOIL AREA

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT: N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 40'	CAD FILE NAME: CSK-113.DGN	
REF. DWG(S).: REF. DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

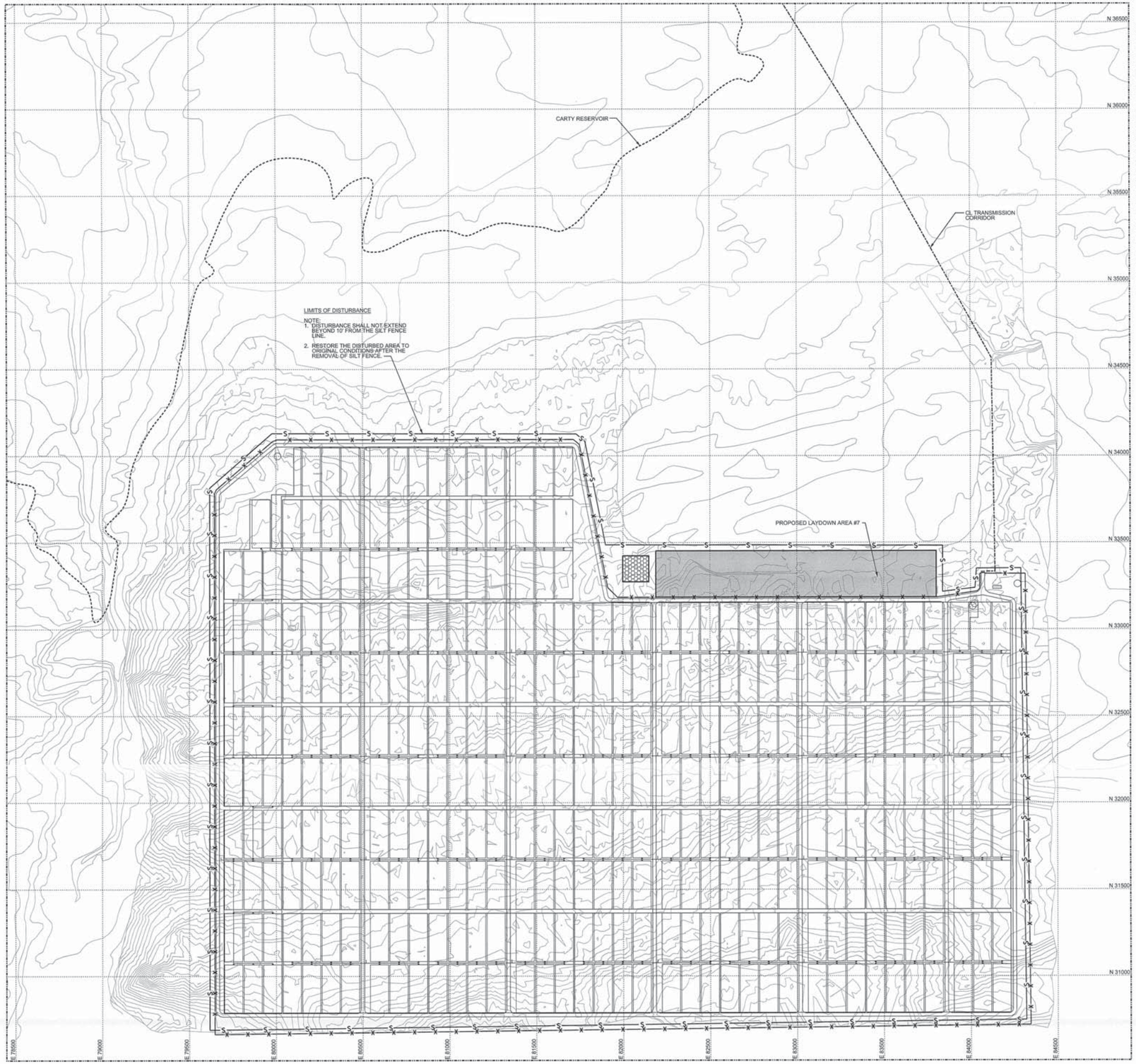
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 11

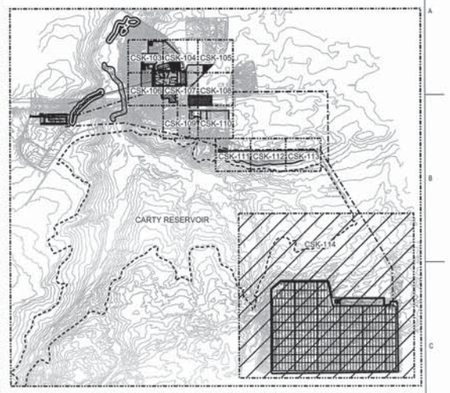
DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-113	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL OR THAT OF ITS SUBCONTRACTOR(S) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
68402 PE
OREGON
SEPT. 10, 2013
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016



KEY PLAN



FOR PERMIT ONLY

EROSION CONTROL MEASURES	
TEMPORARY	PERMANENT
SILT FENCE	PERMANENT SEEDING
DITCH CHECKS	SURFACING
SEEDING	ASPHALT PAVING
	EROSION CONTROL BLANKET

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1"=200'-0"

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- —S——S— SILT FENCE
- SOIL STORAGE/SPOIL AREA
- —X——X——X— FENCE

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sergent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-114.DGN	
REF_DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

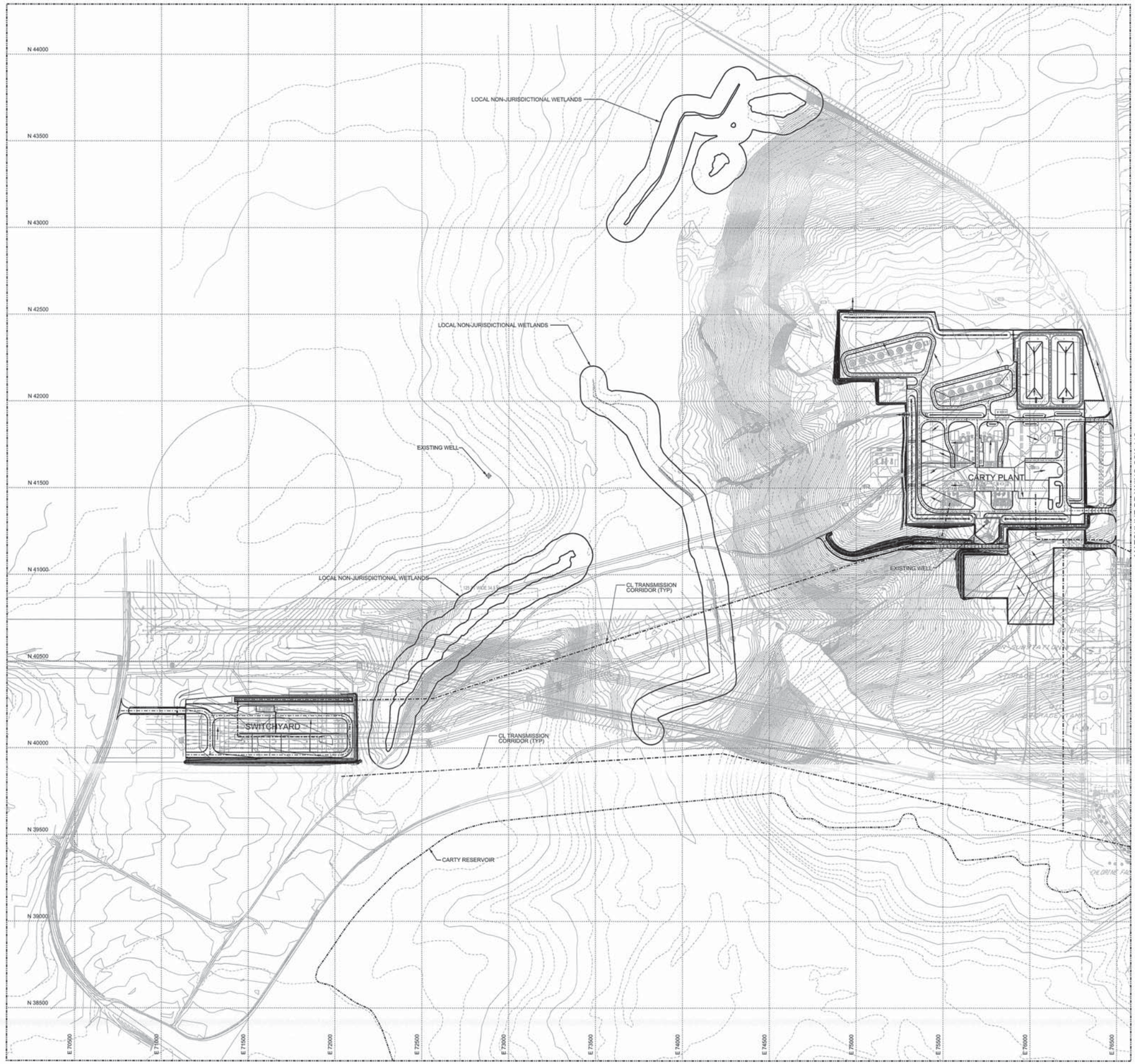
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
SHEET 12

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
SEP. 10, 2015
JOSEPH F. PETRO
RENEWS: DEC. 31, 2016

DRAWING NO.:	SHEET NO.:	REV NO.:
CSK-114	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- GRADE SURFACE FLOW INDICATOR
- WELL
- EXISTING TRANSMISSION TOWER

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT: N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-115.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

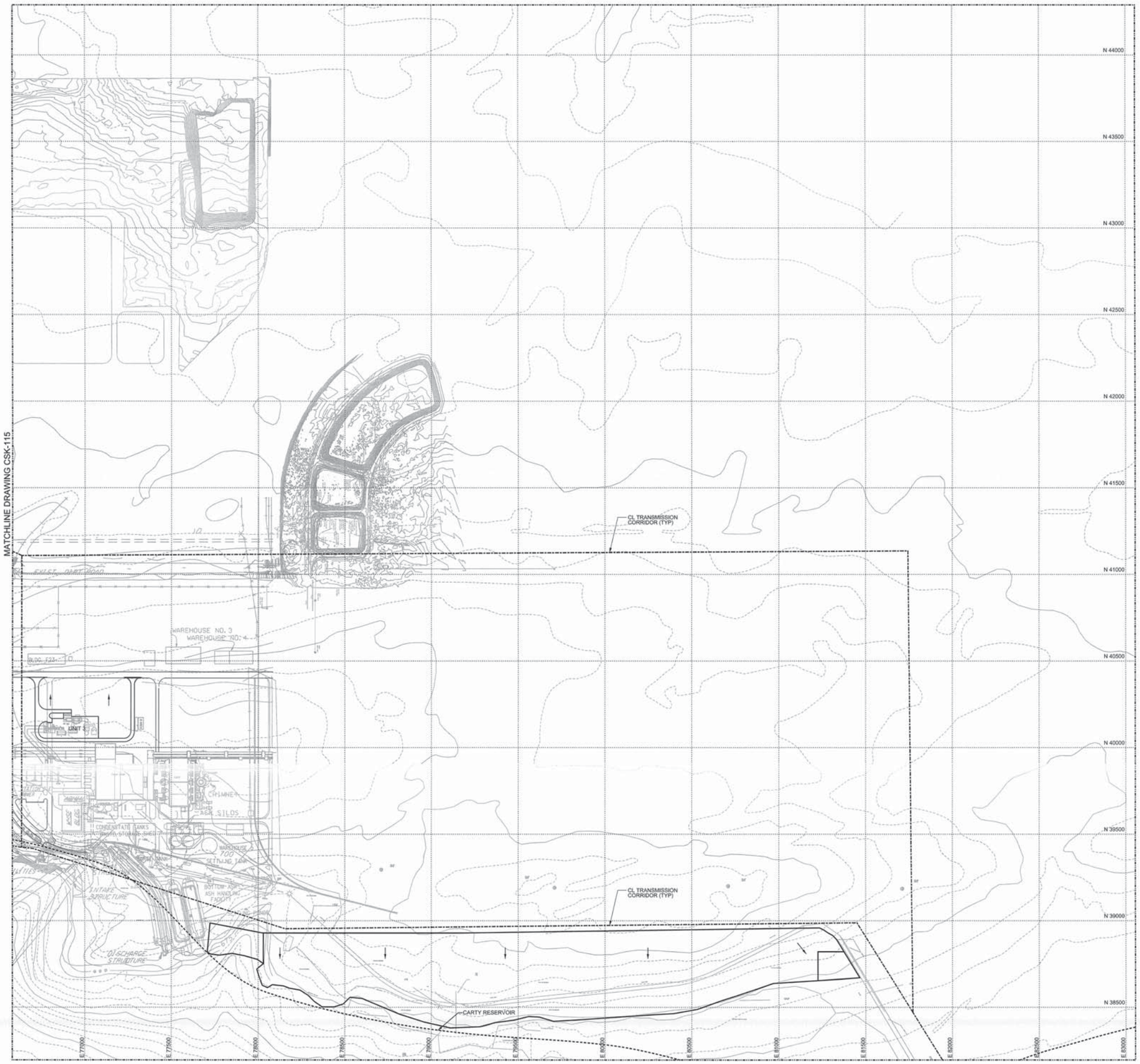
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 1

DRAWING NO.:	SHEET NO.:	REV NO.:
CSK-115	1	0

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
SEPT. 15, 2015
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- GRADE SURFACE FLOW INDICATOR
- WELL
- EXISTING TRANSMISSION TOWER

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9-1-28	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-116.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
85402PE
OREGON
DEC. 10, 2007
JOSEPH T. PETERS
RENEWS: DEC. 31, 2016

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 2

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-116	1	0



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- GRADE SURFACE FLOW INDICATOR
- WELL
- EXISTING TRANSMISSION TOWER
- FENCE

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV.	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/206	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-117.DGN	
REF_DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

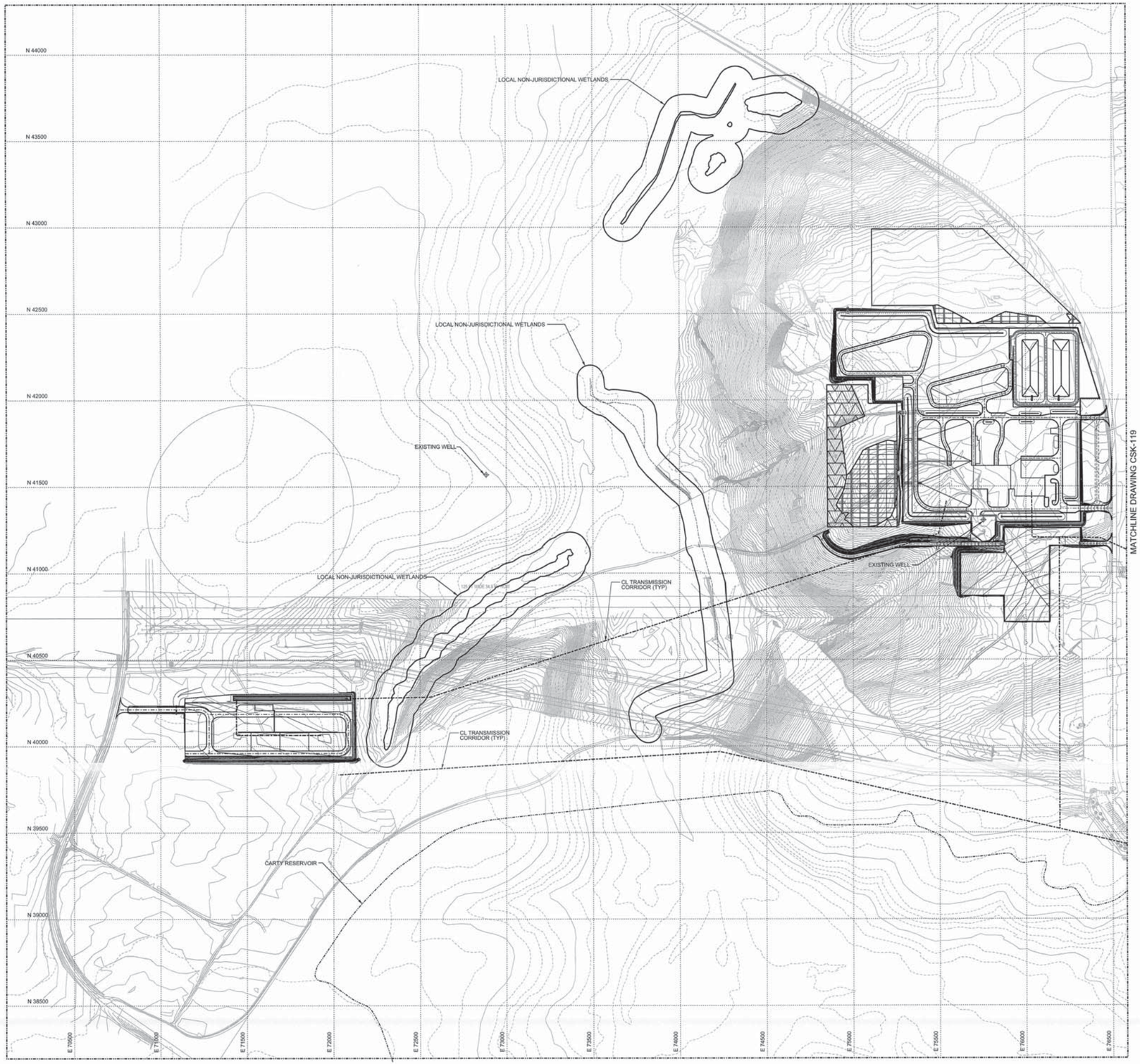
REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
EXPIRES: DEC. 31, 2016
JOSEPH F. PETERS

RENEWS:

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN PRE-CONSTRUCTION DRAINAGE SHEET 3

DRAWING NO.:	SHEET NO.:	REV. NO:
CSK-117	1	0



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- WELL
- EXISTING TRANSMISSION TOWER
- AREAS OF FILL
- AREAS OF CUT

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT: N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV.	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/2016	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-118.DGN	
REF. DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

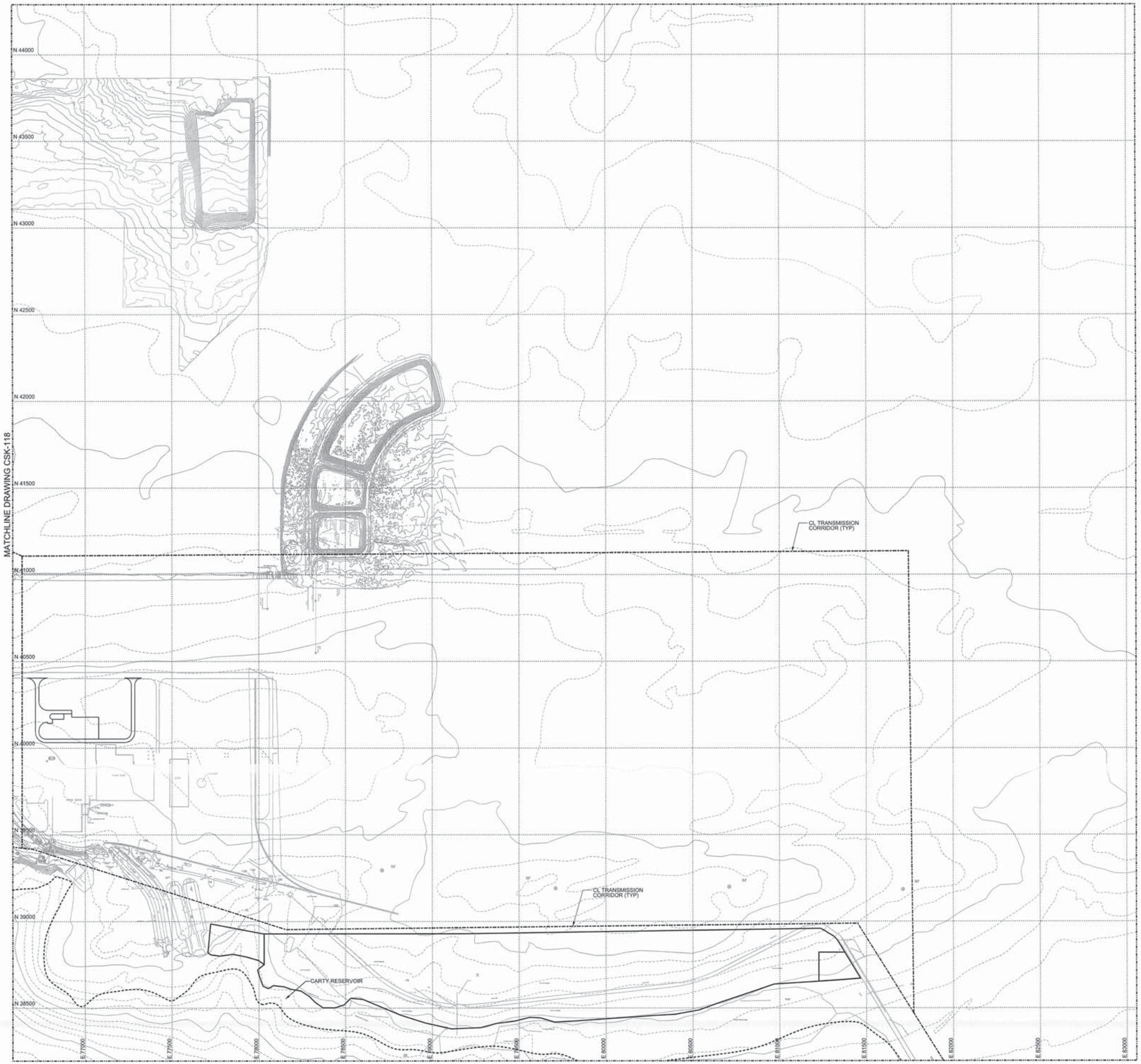
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
CUT/FILL AREAS - PLAN
SHEET 1

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-118	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
Joseph F. Peters
RENEWS: DEC. 31, 2016



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- WELL
- EXISTING TRANSMISSION TOWER
- AREAS OF FILL
- AREAS OF CUT

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	8/1/28	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-119.DGN	
REF_DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
88403PE
OREGON
SEPT. 10, 2013
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN CUT/FILL AREAS - PLAN SHEET 2

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-119	1	0



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- WELL
- EXISTING TRANSMISSION TOWER
- AREAS OF FILL (NOTE 2)
- AREAS OF CUT (NOTE 2)
- FENCE

NOTES

1. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)
2. MINOR SITE GRADING WILL BE PERFORMED TO FILL LOCAL DEPRESSIONS OR CUT LOCAL HIGH POINTS. MASS GRADING OR HIGH LEVELS OF CUT AND FILL WILL BE AVOIDED, TO THE EXTENT POSSIBLE, TO MINIMIZE IMPACT TO THE SITE. EXISTING DRAINAGE PATTERNS ON SITE WILL BE MAINTAINED.

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9-13-16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-120.DGN	
REF. DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

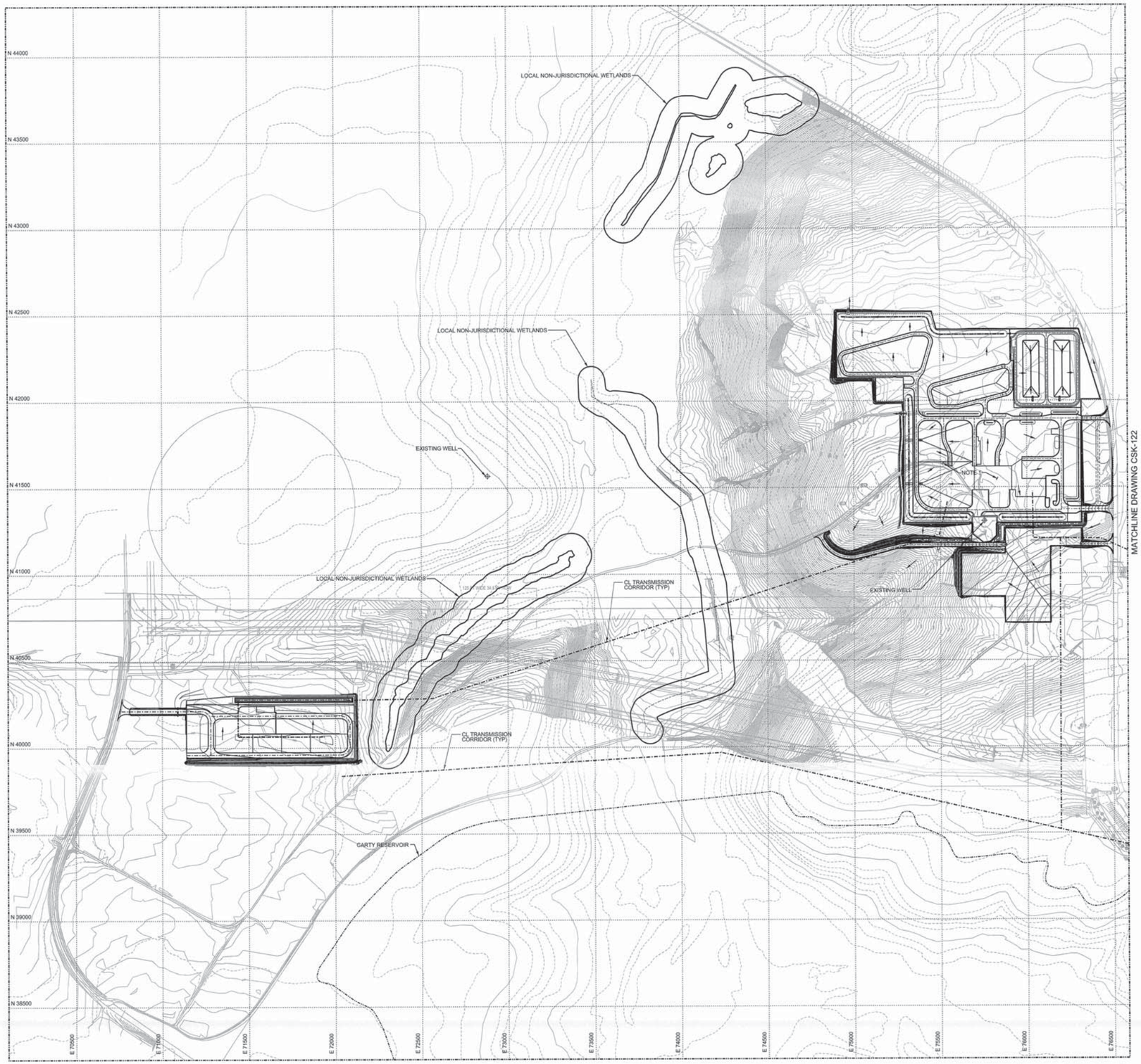
EROSION CONTROL - SITE PLAN CUT/FILL AREAS - PLAN SHEET 3

DRAWING NO.:	SHEET NO.:	REV. NO:
CSK-120	1	0

REGISTERED PROFESSIONAL ENGINEER
88402PE
OREGON
SEP. 10, 2013
JOSEPH F. PETRO

RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL OR THAT OF ITS SUBCONTRACTOR(S) PERFORMING THE WORK.



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

670	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	GRADE SURFACE FLOW INDICATOR
	WELL
	EXISTING TRANSMISSION TOWER

NOTES

1. POST DEVELOPMENT ELEVATION CONTOURS FOR GENERATING FACILITY AND SWITCHYARD WILL BE SUBMITTED TO DEQ. IN AN ACTION PLAN, AT A LATER DATE.
2. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27), STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)

REV.	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/7/16	ISSUED FOR PERMIT	AP	-	MT	-	SF

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-121.DGN	
REF_DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

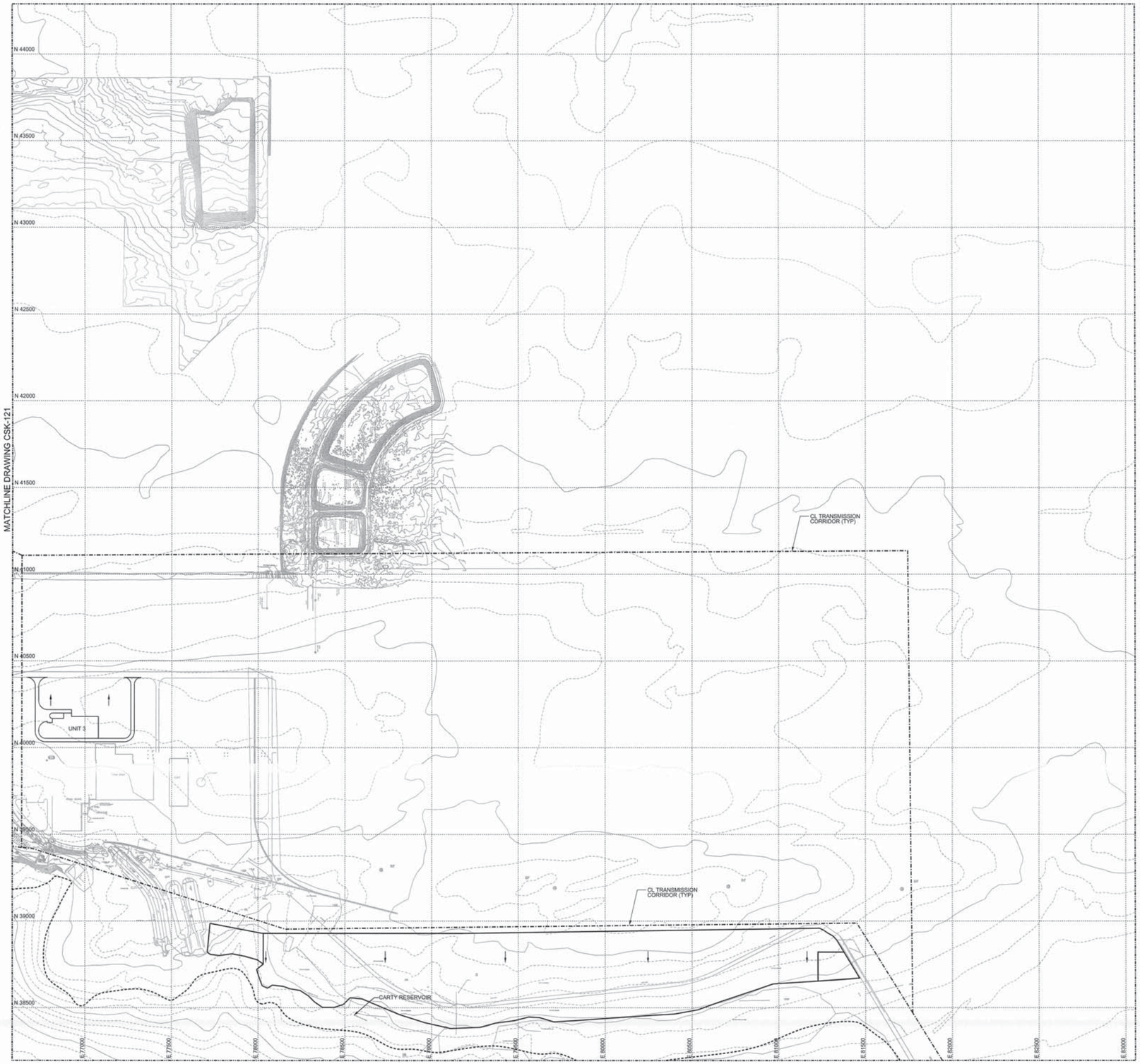
CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
POST-CONSTRUCTION DRAINAGE
SHEET 1

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-121	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
88402 PE
OREGON
SEP. 10, 2013
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- 670 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- GRADE SURFACE FLOW INDICATOR
- WELL
- EXISTING TRANSMISSION TOWER

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1. POST DEVELOPMENT ELEVATION CONTOURS FOR GENERATING FACILITY AND SWITCHYARD WILL BE SUBMITTED TO DEQ, IN AN ACTION PLAN, AT A LATER DATE.
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REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG MGR
0	09-01-16	ISSUED FOR PERMIT	AGP	-	MET	- DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S).: -		
DATE: 06-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-122.DGN	
REF. DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

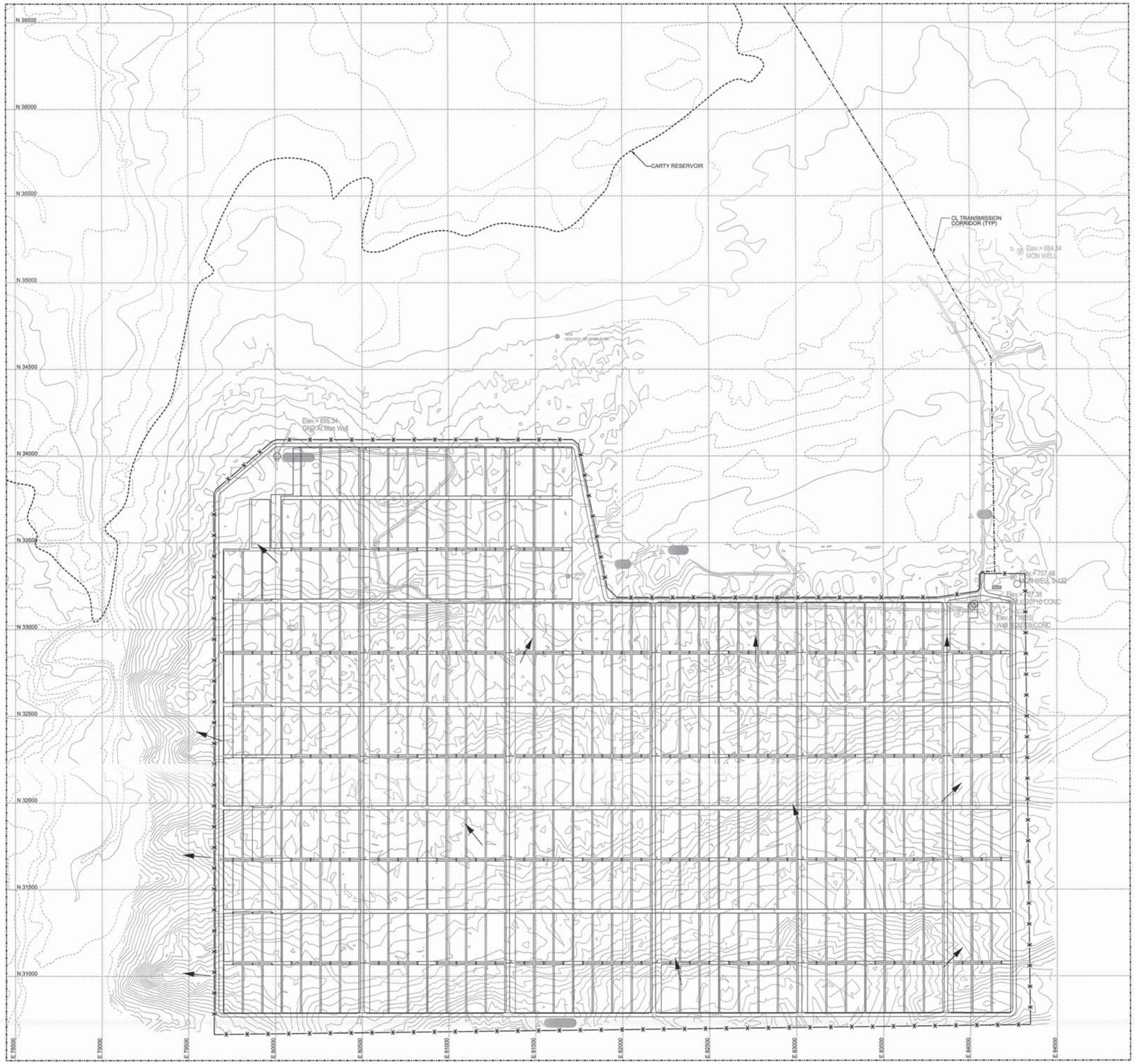
EROSION CONTROL - SITE PLAN POST-CONSTRUCTION DRAINAGE SHEET 2

DRAWING NO.:	SHEET NO.:	REV NO.:
CSK-122	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
OREGON
85402PE
Joseph F. Peters
DEC. 31, 2016
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

670	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	GRADE SURFACE FLOW INDICATOR
	WELL
	FENCE

NOTES

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REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9/1/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-123.DGN	
REF_DWG(S).: REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN POST-CONSTRUCTION DRAINAGE SHEET 3

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-123	1	0

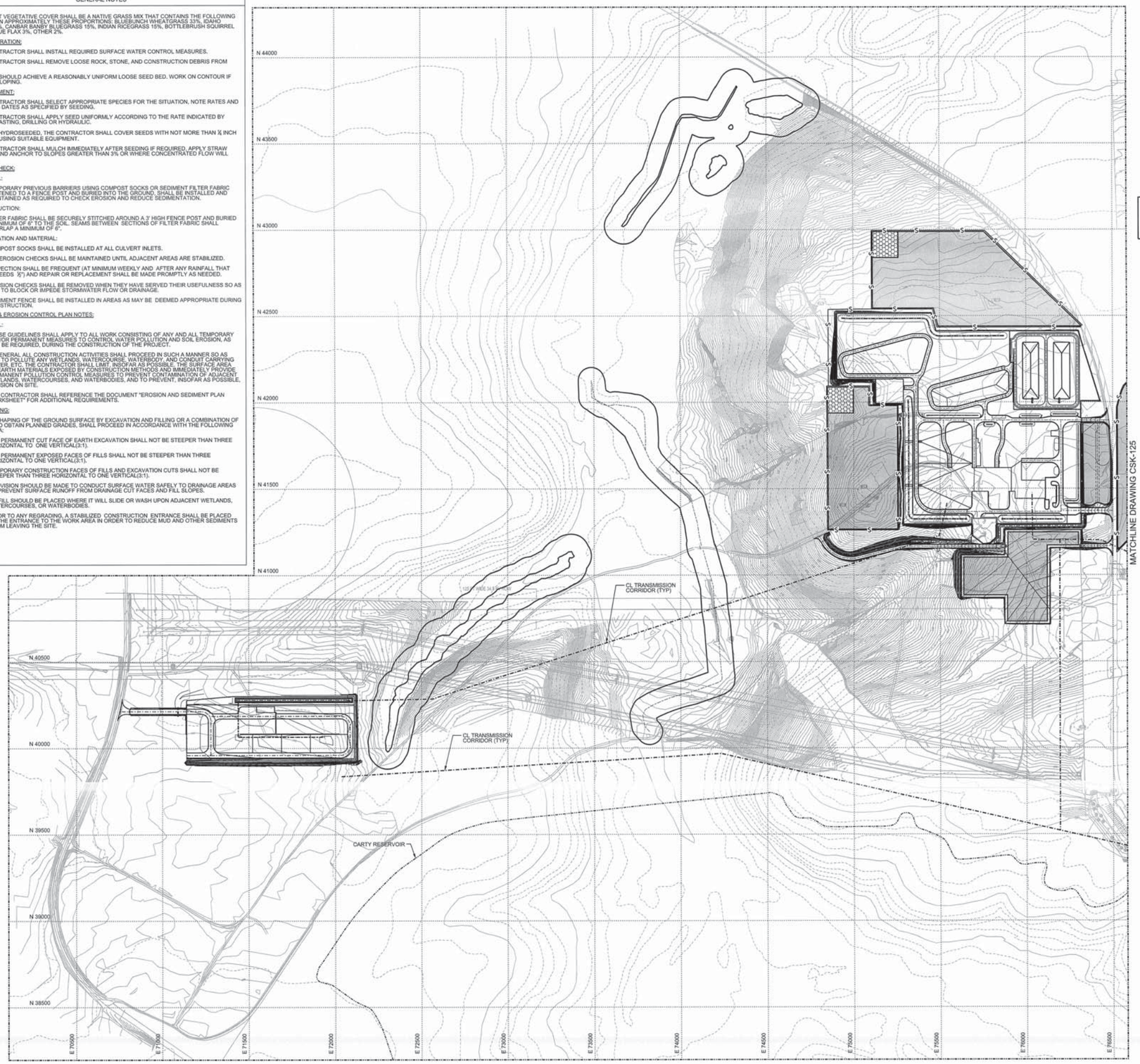
REGISTERED PROFESSIONAL ENGINEER
88402LPE
OREGON
NOV. 10, 2015
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016

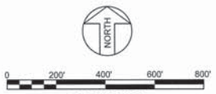
CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

GENERAL NOTES

1. PERMANENT VEGETATIVE COVER SHALL BE A NATIVE GRASS MIX THAT CONTAINS THE FOLLOWING VARIETIES IN APPROXIMATELY THESE PROPORTIONS: BLUEBUNCH WHEATGRASS 33%, IDAHO FESCUE 25%, CANBAR BANBY BLUEGRASS 15%, INDIAN RICEGRASS 15%, BOTTLEBRUSH SQUIRREL TAIL 7%, BLUE FLAX 3%, OTHER 2%.
2. SITE PREPARATION:
   - A) THE CONTRACTOR SHALL INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
   - B) THE CONTRACTOR SHALL REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
   - C) TILLAGE SHOULD ACHIEVE A REASONABLY UNIFORM LOOSE SEED BED. WORK ON CONTOUR IF SITE IS SLOPING.
3. ESTABLISHMENT:
   - A) THE CONTRACTOR SHALL SELECT APPROPRIATE SPECIES FOR THE SITUATION, NOTE RATES AND SEEDING DATES AS SPECIFIED BY SEEDING.
   - B) THE CONTRACTOR SHALL APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED BY BROADCASTING, DRILLING OR HYDRAULIC.
   - C) UNLESS HYDROSEEDED, THE CONTRACTOR SHALL COVER SEEDS WITH NOT MORE THAN ½ INCH OF SOIL USING SUITABLE EQUIPMENT.
   - D) THE CONTRACTOR SHALL MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED, APPLY STRAW MULCH AND ANCHOR TO SLOPES GREATER THAN 3% OR WHERE CONCENTRATED FLOW WILL OCCUR.
4. EROSION CHECK:
   - A) GENERAL:
     - A1) TEMPORARY PREVIOUS BARRIERS USING COMPOST SOCKS OR SEDIMENT FILTER FABRIC FASTENED TO A FENCE POST AND BURIED INTO THE GROUND, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION.
   - B) CONSTRUCTION:
     - B1) FILTER FABRIC SHALL BE SECURELY STITCHED AROUND A 3' HIGH FENCE POST AND BURIED A MINIMUM OF 6" TO THE SOIL. SEAMS BETWEEN SECTIONS OF FILTER FABRIC SHALL OVERLAP A MINIMUM OF 6".
   - C) INSTALLATION AND MATERIAL:
     - C1) COMPOST SOCKS SHALL BE INSTALLED AT ALL CULVERT INLETS.
     - C2) ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.
     - C3) INSPECTION SHALL BE FREQUENT (AT MINIMUM WEEKLY AND AFTER ANY RAINFALL THAT EXCEEDS ½") AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
     - C4) EROSION CHECKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORMWATER FLOW OR DRAINAGE.
     - C5) SEDIMENT FENCE SHALL BE INSTALLED IN AREAS AS MAY BE DEEMED APPROPRIATE DURING CONSTRUCTION.
5. SEDIMENT & EROSION CONTROL PLAN NOTES:
   - A) GENERAL:
     - A1) THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.
     - A2) IN GENERAL ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATERBODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON SITE.
     - A3) THE CONTRACTOR SHALL REFERENCE THE DOCUMENT "EROSION AND SEDIMENT PLAN WORKSHEET" FOR ADDITIONAL REQUIREMENTS.
6. SITE GRADING:
   - A) THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
     - A1) THE PERMANENT CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL(3:1).
     - A2) THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL(3:1).
     - A3) TEMPORARY CONSTRUCTION FACES OF FILLS AND EXCAVATION CUTS SHALL NOT BE STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL(3:1).
     - A4) PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO DRAINAGE AREAS TO PREVENT SURFACE RUNOFF FROM DRAINAGE CUT FACES AND FILL SLOPES.
     - A5) NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON ADJACENT WETLANDS, WATERCOURSES, OR WATERBODIES.
     - A6) PRIOR TO ANY REGRADING, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.



FOR PERMIT ONLY



GRAPHIC SCALE
DRAWING SCALE
1" = 200'

APPROXIMATE ACREAGE (NOTE 6)	
POWER BLOCK AREA	10.0
CONSTRUCTION TRAILERS	3.50
CONSTRUCTION PARKING	7.00
CONSTRUCTION LAYDOWN	85.30
TEMPORARY FUEL STORAGE	0.06
CONCRETE TRUCK WASHOUT	0.06
SOIL STORAGE/SPOIL AREA	4.80

LEGEND

- CONSTRUCTION LAYDOWN
- SOIL STORAGE/SPOIL AREA
- CONSTRUCTION PARKING
- —S— SILT FENCE
- SLOPE IN PLAN

NOTES

1. SEE DRAWING CSK-127 FOR EROSION CONTROL DETAILS.
2. SEDIMENT FENCE LOCATIONS SHOWN ON DRAWINGS MAY BE RELOCATED AT THE DISCRETION OF THE SITE MANAGER TO ACCOUNT FOR INTERFERENCES WITH PAVEMENTS, ROAD CROSSINGS, WOODED AREAS, ETC. RELOCATION OF SEDIMENT FENCE SHALL PROVIDE THE INTENDED SEDIMENT BARRIER AND PROTECTION OF UNDISTURBED LAND AS SHOWN ON THE DRAWINGS.
3. PROVIDE 4" - 6" ROCK WITH NO MINUS FOR ROCK BASE IN WASHDOWN AREA.
4. THE HORIZONTAL CONTROL FOR THIS PROJECT IS THE PLANT GRID SYSTEM. THE PLANT GRID SYSTEM IS TIED TO THE NORTH AMERICAN DATUM OF 1927 (NAD27). STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE PER THE FOLLOWING GRID POINT - N 740,000.0000, E 2,177,000.000 IS EQUAL TO N 40,000.0000, E 77,000.0000. PLANT GRID NORTH IS ROTATED 0.00 DEGREES FROM TRUE NORTH. THE VERTICAL CONTROL SHOWN IS THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
5. APPROXIMATELY 1.0 AC. OF LAND WILL BE DISTURBED AT EACH TRANSMISSION TOWER LOCATION. APPROPRIATE EROSION CONTROL BMP'S WILL BE INSTALLED AS PER THE REQUIREMENTS OF DEQ.
6. ACREAGE PROVIDED INCLUDES ENTIRE SITE DEVELOPMENT INCLUDED IN PERMIT PACKAGE.

REV.	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	08/12/16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-124.DGN	
REF_DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN
OVERALL PLANT SITE-PLAN
SHEET 1

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-124	1	0

REGISTERED PROFESSIONAL ENGINEER
84402PE
OREGON
SEP. 10, 2010
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- CONSTRUCTION LAYDOWN
- SOIL STORAGE/SPOIL AREA
- CONSTRUCTION PARKING
- S — SILT FENCE
- SLOPE IN PLAN

NOTES

1. SEE DRAWING CSK-127 FOR EROSION CONTROL DETAILS.
2. SEDIMENT FENCE LOCATIONS SHOWN ON DRAWINGS MAY BE RELOCATED AT THE DISCRETION OF THE SITE MANAGER TO ACCOUNT FOR INTERFERENCES WITH PAVEMENTS, ROAD CROSSINGS, WOODED AREAS, ETC. RELOCATION OF SEDIMENT FENCE SHALL PROVIDE THE INTENDED SEDIMENT BARRIER AND PROTECTION OF UNDISTURBED LAND AS SHOWN ON THE DRAWINGS.
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6. FOR APPROXIMATE ACREAGE OF SITE DEVELOPMENT SEE DRAWING CSK-124.

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9-1-16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-125.DGN	
REF. DWG(S).: REF. DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

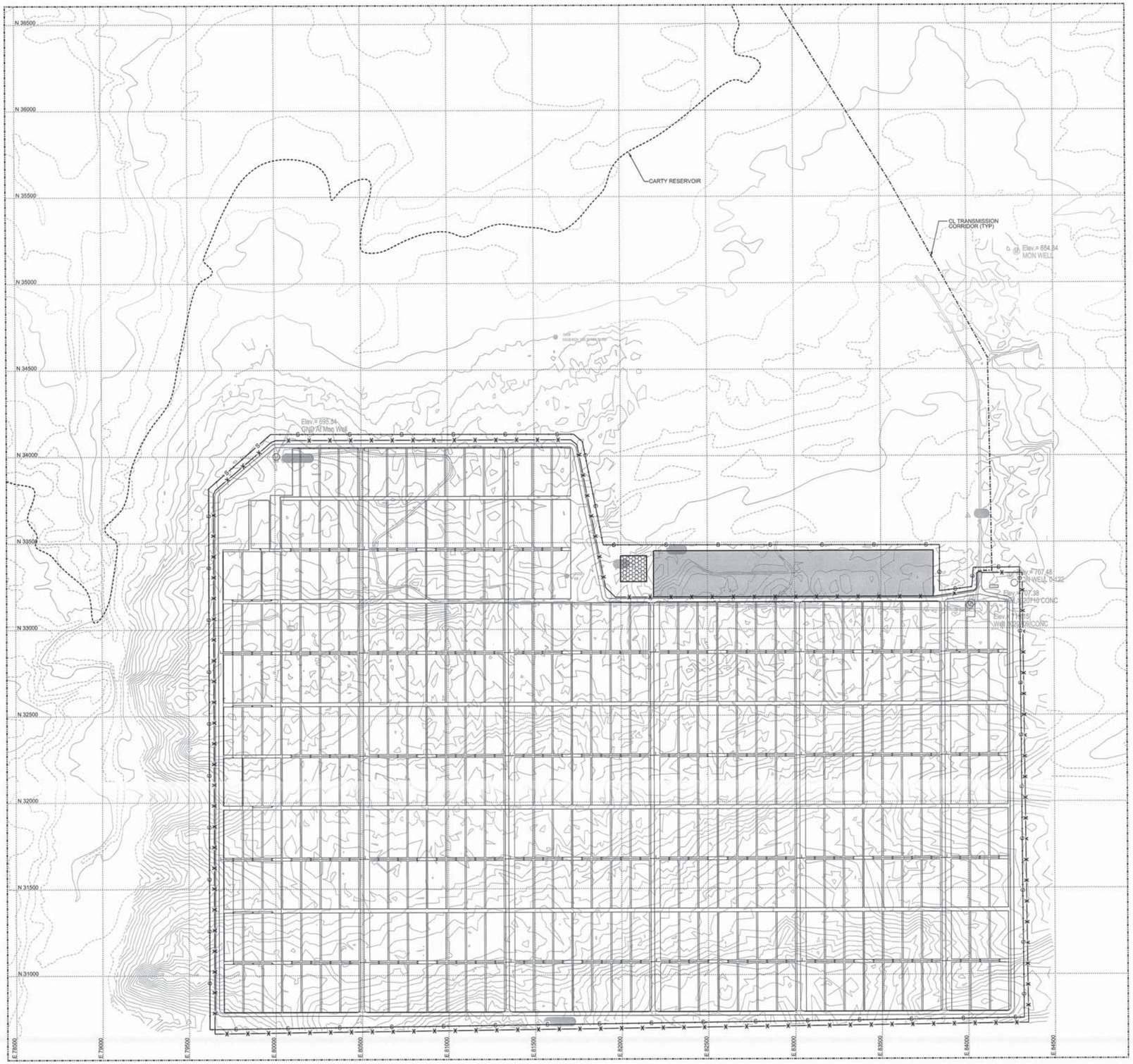
EROSION CONTROL - SITE PLAN OVERALL PLANT SITE-PLAN SHEET 2

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-125	1	0

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
85402 PE
OREGON
SEP. 15, 2015
JOSEPH F. PETERS

RENEWS: DEC. 31, 2016



FOR PERMIT ONLY

NORTH

0 200' 400' 600' 800'

GRAPHIC SCALE
DRAWING SCALE
1" = 200'

LEGEND

- CONSTRUCTION LAYDOWN
- SOIL STORAGE/SPOIL AREA
- CONSTRUCTION PARKING
- —S— SILT FENCE
- SLOPE IN PLAN
- —X—X—X— FENCE

NOTES

1. SEE DRAWING CSK-113 FOR EROSION CONTROL DETAILS.
2. SEDIMENT FENCE LOCATIONS SHOWN ON DRAWINGS MAY BE RELOCATED AT THE DISCRETION OF THE SITE MANAGER TO ACCOUNT FOR INTERFERENCES WITH PAVEMENTS, ROAD CROSSINGS, WOODED AREAS, ETC. RELOCATION OF SEDIMENT FENCE SHALL PROVIDE THE INTENDED SEDIMENT BARRIER AND PROTECTION OF UNDISTURBED LAND AS SHOWN ON THE DRAWINGS.
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6. FOR APPROXIMATE ACREAGE OF SITE DEVELOPMENT SEE DRAWING CSK-124.

REV.	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	9-7-16	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

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DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: 1"= 200'	CAD FILE NAME: CSK-126.DGN	
REF_DWG(S): REF_DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

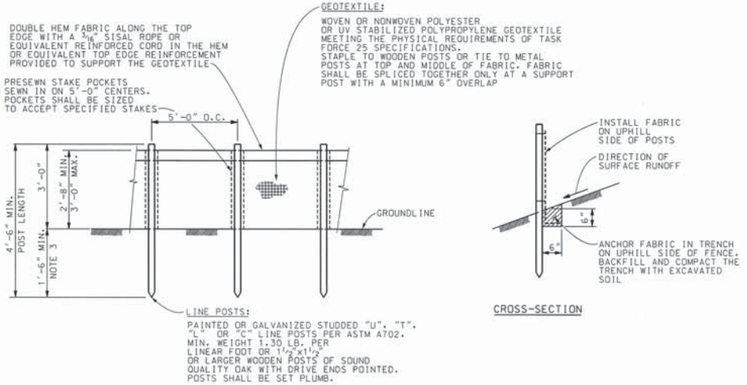
EROSION CONTROL - SITE PLAN
OVERALL PLANT SITE-PLAN
SHEET 3

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTOR'S/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER 38402 PE JOSEPH F. PETTER OREGON SEP. 10, 2003

RENEWS: DEC. 31, 2018

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-126	1	0



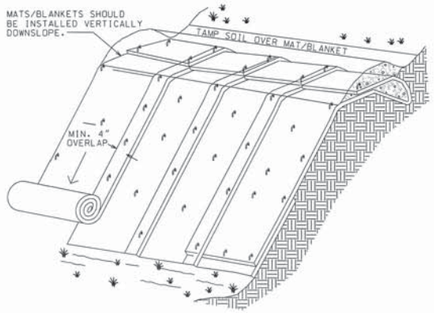
FRONT ELEVATION

CROSS-SECTION

NOTES:

1. AFTER INSTALLATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFACTORILY MAINTAINING THE FENCE. THE CONTRACTOR SHALL INSPECT FENCES AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. CONTRACTOR IS RESPONSIBLE FOR REMOVING AND REPLACING SILT FENCING NOT FUNCTIONING DUE TO CLOGGING, DAMAGE OR DETERIORATION.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF FENCING WHEN, AS DETERMINED BY THE PURCHASER, THE FENCING IS NO LONGER NEEDED.
3. WHERE 18" DEPTH IS IMPOSSIBLE TO ACHIEVE THE POSTS SHALL BE SECURED TO PREVENT OVERTURNING OF THE FENCE DUE TO SEDIMENT LOAD.

TYPICAL DETAIL
SELF-SUPPORTING SILT FENCE
DETAIL CSK-127-01
(SEE DRAWINGS CSK-103 THRU CSK-114)
N.T.S.





TERMINAL SLOPE AND CHANNEL

EROSION CONTROL BLANKET INSTALLATION
DETAIL CSK-127-02
(SEE DRAWINGS CSK-103 THRU CSK-114)
N.T.S.

EROSION CONTROL BLANKET TYPES

CATEGORY	SERVICE APPLICATION	USE	ACCEPTABLE TYPES
1	TEMPORARY	FLAT AREAS. SHOULDER DRAIN OUTLETS ROADWAY SHOULDERS. LAWNS. MOWED AREAS	STRAW. WOOD FIBER. RAPIDLY DEGRADABLE NETTING ON ONE SIDE
2	ONE SEASON	SLOPES 1:3 AND STEEPER LESS THAN 50 FT LONG. DITCHES WITH GRADIENTS 2% OR LESS. FLOW VELOCITIES LESS THAN 5.0 FPS.	STRAW. WOOD FIBER. NETTING ON ONE SIDE
3	ONE SEASON	SLOPES 1 VERTICAL:3 HORIZONTAL AND STEEPER. MORE THAN 50 FT. LONG. DITCHES WITH GRADIENTS 3% OR LESS. FLOW VELOCITIES LESS THAN 6.5 FPS.	STRAW. WOOD FIBER. NETTING ON TWO SIDES
4	SEMIPERMANENT	DITCHES WITH GRADIENTS 4% OR LESS. FLOW VELOCITIES LESS THAN 8.0 FPS. FLOW DEPTH 6 INCHES OR LESS.	STRAW/COCONUT. WOOD FIBER. NETTING ON TWO SIDES
5	SEMIPERMANENT	DITCHES WITH GRADIENTS 8% OR LESS. FLOW VELOCITIES LESS THAN 15.0 FPS AND FLOW DEPTH LESS THAN 8 INCHES. WATERCOURSE BANKS WITHIN THE NORMAL FLOW ELEVATION	COCONUT FIBER. NETTING ON TWO SIDES

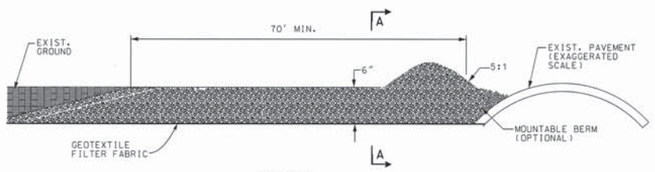
SOURCE: MPCA 2000

EROSION CONTROL BLANKET INSTALLATION NOTES

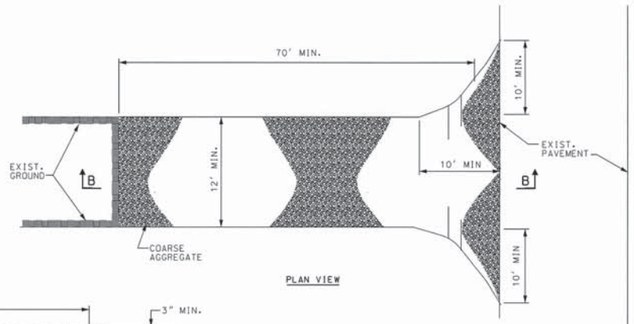
1. THE CONTRACTOR SHALL PREPARE SOIL (GRADE AND SMOOTH SLOPES) BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP'S), INCLUDING ANY APPLICATION OF LIME, FERTILIZER AND SEED.
2. THE CONTRACTOR SHALL BEGIN AT TOP OF THE SLOPE BY ANCHORING THE REP'S IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP'S EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP'S WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP'S BACK OVER SEED AND COMPACTED SOIL. THE CONTRACTOR SHALL SECURE RECP'S OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WITH OF THE RECP'S.
3. THE CONTRACTOR SHALL ROLL THE RECP'S DOWN ACROSS THE SLOPE. RECP'S WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP'S MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP'S MUST BE STAPLED WITH APPROXIMATELY 4"-6" OVERLAP.
5. CONSECUTIVE RECP'S SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH APPROPRIATE 3" OVERLAP. THE CONTRACTOR SHALL STAPLE THROUGH OVERLAPPED AREA. APPROXIMATELY 12" APART ACROSS ENTIRE RECP'S WITH.
6. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

MAINTENANCE

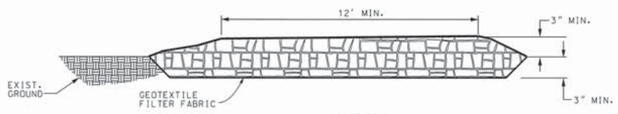
1. THE CONTRACTOR SHALL INSPECT ALL MULCHES AND EROSION CONTROL FABRICS PERIODICALLY, AND AFTER RAINSTORMS TO CHECK FOR RILL EROSION, DISLOCATION OR FAILURE. WHERE EROSION IS OBSERVED, APPLY ADDITIONAL MULCH OR REPAIR FABRIC.
2. THE CONTRACTOR SHALL CONTINUE INSPECTIONS UNTIL VEGETATION IS ESTABLISHED.
3. IF WASHOUT OCCURS, THE CONTRACTOR SHALL REPAIR THE SLOPE GRADE, RESEED AND REINSTALL MULCH. CONTINUE INSPECTIONS UNTIL VEGETATION IS FIRMLY ESTABLISHED.



SECTION B

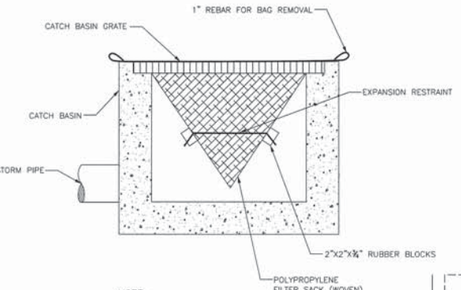


PLAN VIEW



SECTION A

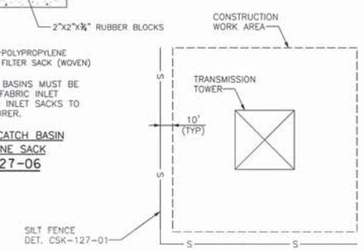
TYPICAL DETAIL
STONE CONSTRUCTION ENTRANCE
DETAIL CSK-127-03
N.T.S.



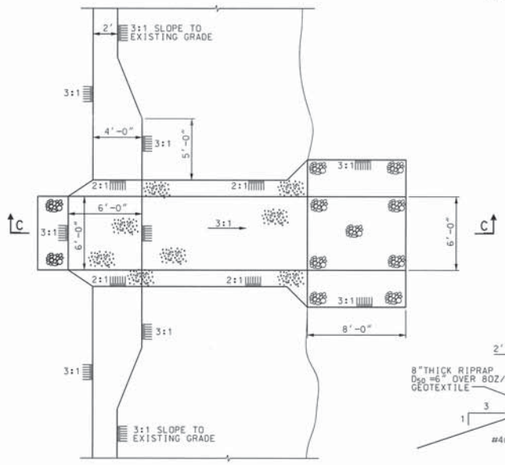
NOTE:

1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

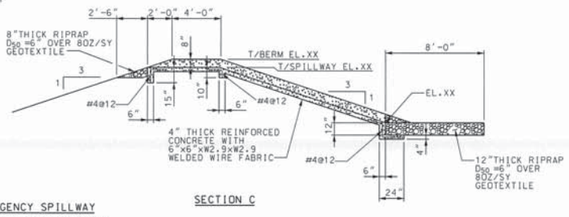
SEDIMENT CONTROL AT CATCH BASIN
WOVEN POLYPROPYLENE SACK
DETAIL CSK-127-06
N.T.S.



TRANSMISSION TOWER
EROSION CONTROL SEDIMENT PLAN
DETAIL CSK-127-07
N.T.S.

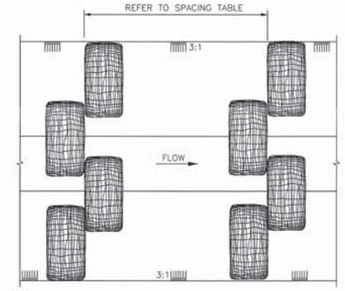


PLAN

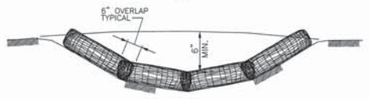


SECTION C

EMERGENCY SPILLWAY
DETAIL CSK-127-04
N.T.S.



PLAN VIEW
NTS



PROFILE
NTS

NOTES:

1. STAKING OF BAGS REQUIRED USING (2) 1"x2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. SURFACE MUST BE SMOOTH BEFORE APPLICATION.
3. CHECK DAMS CAN BE CONSTRUCTED USING STRAW WATTLES OR OTHER MATERIALS AS APPROVED BY DEQ.

DITCH EROSION CHECK FOR TRAPEZOIDAL DITCH
DETAIL CSK-127-05
N.T.S.

SPACING FOR CHECK DAMS TABLE

DITCH SLOPE	6 INCH	12 INCH	18 INCH
6%	NOT ALLOWED	16 FT O.C.	26 FT O.C.
5%	NOT ALLOWED	20 FT	30 FT
4%	NOT ALLOWED	26 FT	40 FT
3%	15 FT	33 FT	50 FT
2%	25 FT	50 FT	80 FT

FOR PERMIT ONLY

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE, INCLUDING CONTRACTORS/INSTALLER'S PERSONNEL (OR THAT OF ITS SUBCONTRACTOR(S)) PERFORMING THE WORK.

REGISTERED PROFESSIONAL ENGINEER
88402PE
OREGON
DEC. 10, 2013
JOSEPH F. PETERS
RENEWS: DEC. 31, 2016

REV	DATE	DESCRIPTION	BY	CHK	ENG	ENG	MGR
0	08-17-2016	ISSUED FOR PERMIT	AGP	-	MET	-	DJP

REVISIONS

WARNING

Sargent & Lundy

VENDOR & REF. DWG(S): -		
DATE: 08-17-2016	DESIGNER: AGP	CHECKED BY:
DRAWN BY: AGP	DESIGN ENGR.: MET	ENGR. MGR.: DJP
SCALE: NONE	CAD FILE NAME: CSK-127.DGN	
REF. DWG(S): REF. DWG		

PORTLAND GENERAL ELECTRIC CO.
121 SW SALMON ST. PORTLAND, OR 97204

CARTY GENERATING STATION

EROSION CONTROL - SITE PLAN SECTIONS AND DETAILS SHEET 1

DRAWING NO.:	SHEET NO.:	REV. NO.:
CSK-127	1	0

EXHIBIT J – Request for Amendment No. 1

JURISDICTIONAL WETLANDS
OAR 345-021-0010(1)(j)

TABLE OF CONTENTS

J.1 INTRODUCTION J-1

J.2 POTENTIAL WATERS OF THE STATE OR WATERS OF THE UNITED STATES J-1

J.3 ANALYSIS OF POTENTIAL IMPACTS TO WATERS OF THE STATE OR WATERS OF THE UNITED STATES J-2

J.4 DESCRIPTION OF SIGNIFICANT POTENTIAL IMPACTS TO EACH WATER FEATURE J-3

J.5 EXPLANATION OF WHY A REMOVAL-FILL AUTHORIZATION WOULD NOT BE REQUIRED, IF APPLICABLE J-3

J.6 EVIDENCE THAT REMOVAL-FILL PERMITS CAN BE ISSUED J-3

J.7 MITIGATION FOR IMPACTS TO WATER FEATURES J-3

J.8 REFERENCES J-4

FIGURES

Figure J-1 Wetlands and Waterbodies Delineated within the Amended Site Boundary

APPENDICES

Appendix J-1 Carty Generating Station 2016 Waters Delineation Report

Revised January 2018

Appendix J-2 Oregon Department of State Lands 2013 Concurrence

J.1 INTRODUCTION

OAR 345-021-0010(1)(j) *Information based on literature and field study, as appropriate, about waters of this state, as defined under ORS 196.800.*

Response: This exhibit provides the information required by Oregon Administrative Rules 345-021-0010(1)(j) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). The analysis area for waters of the State includes all areas within the amended Site Boundary. This exhibit addresses the potentially jurisdictional wetlands and waterbodies in proximity to the Carty Solar Farm (as defined in Exhibit B). The Application for Site Certificate (ASC) describes potentially jurisdictional wetlands and waterbodies within the original Site Boundary.

On December 24, 2013, the Oregon Department of State Lands (DSL) issued their concurrence with the Wetland Delineation Report submitted in support of the ASC. DSL based this concurrence on information provided in Portland General Electric Company's (PGE's) original 2009 Wetland Delineation Report (ASC Exhibit J, Appendix J-1) and the Addendum to the Wetland Delineation Report, submitted to DSL in December 2013 (see Appendix J-2 of the RFA for Addendum delineation figures). That concurrence is valid for five years from the date of the concurrence letter, unless new information necessitates a revision.

The 2016 Waters Delineation Report (Appendix J-1 of this RFA) describes the results of wetlands and waterbody surveys in the Carty Solar Farm. In addition, the 2016 report updates delineations in an area not associated with the Carty Solar Farm—specifically, the corridor for the previously planned Unit 2 to Grassland Switchyard transmission line. Although PGE no longer plans to construct this transmission line, as is reflected in this RFA, PGE has opted to submit updates of the delineated features (three wetland and two streams) in this area to DSL for concurrence review.

J.2 POTENTIAL WATERS OF THE STATE OR WATERS OF THE UNITED STATES

OAR 345-021-0010(1)(j)(A) *A description of all areas within the site boundary that might be waters of this state and a map showing the location of these features.*

Response: PGE's environmental consultant, Ecology and Environment, Inc. (E & E), conducted field surveys in 2016 to identify and delineate wetlands and waterbodies within the Carty Solar Farm (as defined in Exhibit B). Surveys in areas within the original Site Boundary were initially conducted in 2009, and again in 2012 and 2013.

Based on the results of these surveys, E & E determined that there are eight wetlands, two streams, and one artificial pond (sewage lagoon) within the amended Site Boundary (Figure J-1). The eight wetlands and two streams are located within the original Site Boundary, and were first delineated during the 2009, 2012, and 2013 field seasons. The sewage lagoon, recorded during the 2016 survey, is the only water identified in the analysis area that is within the Carty Solar Farm.

The sewage lagoon is located 2,100 feet east of Unit 1, within the Boardman Plant railroad loop. The southern portion of the sewage lagoon is adjacent to one of the potential routes for the Carty Solar Farm interconnection transmission line proposed under this RFA (see Figure J-1). E & E detected no other wetlands or streams within the Carty Solar Farm.

The eight wetlands and two streams are located in the areas north of the northern dam embankment for the Carty Reservoir, and also west and northwest of Unit 1. Refer to Appendix J-2 (DSL's 2013 Concurrence of Delineations) for detailed depictions of these waters. E & E re-surveyed five of these features in 2016. As described in Section J.1, in 2016, biologists also surveyed an area associated with the previously proposed Unit 2 to Grassland Switchyard transmission line, which PGE no longer plans to build. This resulted in updated delineations of three wetlands (palustrine emergent) and two streams (one ephemeral and one with intermittent and ephemeral reaches). All five of these features are located north (and outside) of one of the potential routes for the Carty Solar Farm interconnection transmission line.

Refer to the Appendix J-1 of the ASC – 2009 Wetland Delineation Report (E & E 2009) and the 2013 Addendum to the 2009 Wetland Delineation Report (E & E 2013) for details of survey results in the original Site Boundary. Refer to Appendix J-2 of this RFA – Oregon Department of State Lands 2013 Concurrence for the DSL's December 24, 2013 concurrence letter mentioned above. Refer to Appendix J-1 of this RFA – 2016 Waters Delineation Report for details of survey results within the 2016 survey Study Area, which included potential disturbance areas associated with the Carty Solar Farm.

J.3 ANALYSIS OF POTENTIAL IMPACTS TO WATERS OF THE STATE OR WATERS OF THE UNITED STATES

OAR 345-021-0010(1)(j)(B) *An analysis of whether construction or operation of the proposed facility would adversely affect any waters of this state.*

Response: Construction and operation of the Carty Solar Farm would not adversely affect any waters of the State or waters of the United States. PGE is proposing to construct the project without any permanent or temporary impacts on the wetlands or waterbodies located within the amended Site Boundary. The Carty Solar Farm does not intersect the documented wetlands or streams, and PGE anticipates no direct or indirect impacts on these waters. The sewage lagoon is

the only water identified in the analysis area that is within the Carty Solar Farm. However, the sewage lagoon is adjacent to one of the potential routes for the Carty Solar Farm interconnection transmission line proposed under this RFA. This feature does not qualify as a water of the State or water of the United States.

J.4 DESCRIPTION OF SIGNIFICANT POTENTIAL IMPACTS TO EACH WATER FEATURE

OAR-345-021-0010(1)(j)(C) *A description of the significance of potential adverse impacts to each feature identified including the nature and amount of material the applicant would remove from or place in the waters.*

Response: PGE would not remove materials from nor place materials in the waters described in this exhibit. Construction and operation of the Carty Solar Farm would not adversely affect these features.

J.5 EXPLANATION OF WHY A REMOVAL-FILL AUTHORIZATION WOULD NOT BE REQUIRED, IF APPLICABLE

OAR 345-021-0010(1)(j)(D) *If the proposed facility would not need a removal-fill authorization, an explanation of why no such authorization is required for the construction and operation of the proposed facility.*

Response: PGE does not anticipate the need for a removal-fill authorization because construction and operation of the Carty Solar Farm would not require removal of materials from or placement of materials in any wetland or waterbody features.

J.6 EVIDENCE THAT REMOVAL-FILL PERMITS CAN BE ISSUED

OAR 345-021-0010(1)(j)(E) *If the proposed facility would need a removal-fill authorization, information to support a determination by the Council that the Oregon Department of State Lands should issue a removal-fill permit, including information in the form required by the Department of State Lands under OAR Chapter 141 Division 85.*

Response: PGE does not anticipate the need for a removal-fill authorization.

J.7 MITIGATION FOR IMPACTS TO WATER FEATURES

OAR 345-021-0010(1)(j)(F) *A description of proposed actions to mitigate adverse impacts to the features identified and the applicant's proposed monitoring program, if any, for such impacts.*

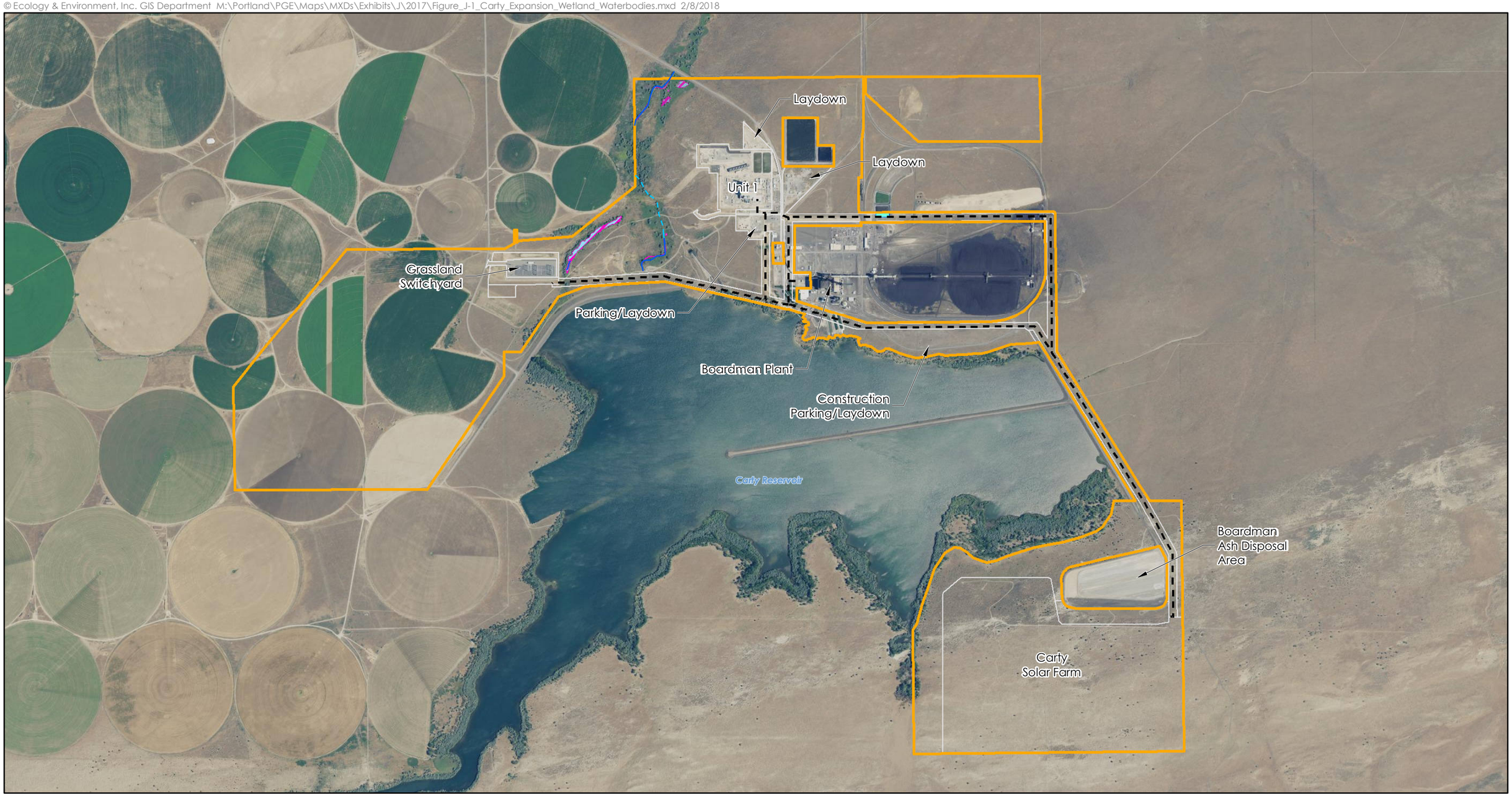
Response: PGE does not expect the construction and operation of the Carty Solar Farm to affect any wetland or waterbody features. Therefore, the project would not require any authorizations from government agencies that regulate activities affecting jurisdictional waters, and mitigation for impacts on jurisdictional waters is not necessary.

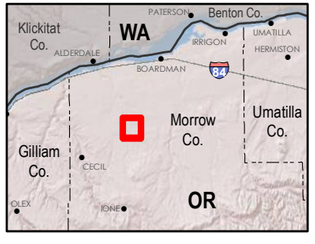
J.8 REFERENCES

E & E (Ecology and Environment, Inc.). 2013. 2013 Addendum to the Wetland Delineation Report for the Carty Generating Station. Submitted to Oregon Department of State Lands in September 2013 in support of the PGE Carty Generating Station Application for Site Certificate. Portland, Oregon

E & E (Ecology and Environment, Inc.). 2009. Wetland Delineation Report. PGE Carty Generating Station Application for Site Certificate. Portland, Oregon

© Ecology & Environment, Inc. GIS Department M:\Portland\PGE\Maps\MXDs\Exhibits\J\2017\Figure_J-1_Carty_Expansion_Wetland_Waterbodies.mxd 2/8/2018





- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas

Stream
- Ephemeral
- Intermittent

- Wetland
- Artificial Pond

N

1:22,000

Miles
0 0.25 0.5

Credits: Copyright:© 2014 Esri
Esri, USDA Farm Service Agency

Figure J-1
Wetlands and Waterbodies Delineated within Amended Site Boundary

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

Appendix J-1
Carty Generating Station 2016 Waters Delineation Report

Revised January 2018

Carty Generating Station

2016 Waters Delineation Report

Revised January 2018

Prepared for:

Portland General Electric

121 SW Salmon St.

Portland, OR 97204

Prepared by:

Ecology and Environment, Inc.

333 SW Fifth Avenue, Suite 600

Portland, Oregon 97204

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TABLE OF CONTENTS

A) LANDSCAPE SETTING AND LAND USE 1

A-1) Purpose and Scope 1

A-2) Ecoregion, Hydrologic Unit Codes, and Climate 1

A-3) Land Cover 2

A-4) Predominant Natural Plant Communities 2

B) SITE ALTERATIONS 3

C) PRECIPITATION DATA AND ANALYSIS 5

D) METHODS 7

E) DESCRIPTION OF WETLANDS AND NON-WETLAND WATERS 8

E-1) Wetlands 9

E-2) Non-Wetland Waters 10

F) DEVIATION FROM LWI OR NWI 12

G) MAPPING METHOD 13

H) ADDITIONAL INFORMATION 13

Soils 13

I) RESULTS AND CONCLUSIONS 13

J) DISCLAIMER 13

K) REFERENCES 14

List of Attachments

A Wetland Determinations Data Forms

B Streamflow Duration Field Assessment Forms

C Figures

D Photographic Log

List of Tables

Table **Page**

Table C-1 Precipitation Data from the Boardman, Oregon Meteorological Station for Survey Dates and Preceding Two Weeks 5

Table C-2 2016 Observed and Normal Precipitation from the Boardman, Oregon Meteorological Station for the Three Months up to and Including the Survey Dates. 6

Table C-3 Cumulative Precipitation for Water Year 6

A) LANDSCAPE SETTING AND LAND USE

A-1) Purpose and Scope

Portland General Electric Company (PGE) is seeking approval to amend the Site Certificate for the Carty Generating Station. The proposed amendment includes adding an approximately 50-megawatt solar unit and associated related or supporting facilities, including potential routes for the solar farm interconnection transmission line, buildout of the Grassland Switchyard if one of the three interconnection options is selected (Option 1), and temporary construction laydown areas (collectively referred to as the Carty Solar Farm herein). The Carty Solar Farm site is located approximately 12 miles southwest of Boardman, Oregon, and adjacent to the existing Boardman Plant and Carty Reservoir in Morrow County, Oregon (Figure 1).

PGE plans to design the amended facilities in a manner that avoids or minimizes impacts on wetlands, streams, or other jurisdictional waters. To facilitate project design, Ecology and Environment, Inc. (E & E) determined the geographic extent and location of waters within the Study Area, which includes the solar array site, alternative transmission line corridors, and construction laydown/parking areas (Figure 2). The Study Area also included an area that is not associated with the Carty Solar Farm, and therefore not proposed for disturbance under this request for amendment—the corridor between the previously approved, but never constructed, Unit 2 and the Grassland Switchyard—for the purpose of updating previous delineations.

This report describes the methods used for, and the results of, the wetlands and waters delineation conducted by E & E from April 5 to 7, 2016. The report addresses potentially jurisdictional waters in proximity to the Carty Solar Farm within the amended Site Boundary. In addition, it includes updated delineations of five wetland and waterbody features not within the Carty Solar Farm that were previously delineated in 2012 and received concurrence from the Oregon Department of State Lands (DSL) in 2013. E & E's 2013 Addendum to the 2009 Wetland Delineation Report (E & E 2013) and DSL's 2013 Concurrence for the delineated features (Appendix J-2) provide information on the geographic distribution of waters within the Site Boundary for the Carty Generating Station as originally proposed.

A-2) Ecoregion, Hydrologic Unit Codes, and Climate

The Carty Generating Station—including the proposed Carty Solar Farm generation facility site—is located in the Umatilla Plateau ecoregion (level IV), which is within the Columbia Plateau ecoregion (level III) (EPA 2010). The Umatilla Plateau consists of nearly level to rolling terrain adjacent to the Columbia River. This ecoregion is underlain

by basalt up to 2 miles thick and partially covered by thick loess deposits (Thorson et al. 2003). Elevation generally ranges from 300 to 3,000 feet above mean sea level. The Study Area is approximately 700 feet above mean sea level.

The Study Area is located in the Sixmile Canyon watershed, Hydrologic Unit Code 1707010108, which is within the Middle Columbia basin. The Columbia River is the nearest major waterbody to the Study Area, situated approximately 9.7 miles to the north.

The climate in this level IV ecoregion is considered "cold semi-arid" or "steppe" according to the Koppen climate classification, because precipitation is generally less than potential evapotranspiration and cold temperatures persist through much of the year (McKnight and Hess 2000). Mean annual precipitation increases with elevation, but typically ranges from 9 to 15 inches (Thorson et al. 2003). The growing season typically extends from March 19 to November 2, as approximated by the median dates (i.e., 50 percent probability) of 28 degrees Fahrenheit (−2.2 degrees Celsius) air temperatures in spring and fall, based on long-term records gathered at the Pendleton Weather Service Office Airport (Taylor et al. 2016).

A-3) Land Cover

The project site is situated in a rural part of Morrow County, which is over 2,000 square miles and supports approximately 11,000 residents. Infrastructure in the county is limited to Interstate Highway 84; state and county roads; and the industrial, commercial, and residential development within the five main communities: Boardman, Irrigon, Ione, Lexington, and Heppner.

The Study Area lies primarily within native and non-native shrublands and grasslands but is relatively close to irrigated cropland—typically grains such as wheat and barley—as well as other crops such as potatoes and alfalfa. Center pivots irrigate the croplands, thereby creating "crop circle" patterns. Dryland winter wheat fields also are present.

Developed areas in the vicinity of the Study Area include the existing Boardman Plant, newly constructed Unit 1 of the Carty Generating Station, existing transmission lines, the Grassland Switchyard, and some dirt roads. There are also outbuildings, laydown areas, material storage areas, parking lots, and cooling ponds attendant to these facilities. Irrigated crop circles are situated over 500 feet north of the western portion of the Study Area.

A-4) Predominant Natural Plant Communities

The predominant vegetation communities in the Umatilla Plateau ecoregion are sagebrush steppe and grassland. Typical dominant vegetation of sagebrush steppe include

big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), Idaho fescue (*Festuca idahoensis*), and Sandberg bluegrass (*Poa secunda*). Grasslands of bluebunch wheatgrass and Idaho fescue with little or no sagebrush also are present (Thorson et al. 2003). In areas with sandy soils, sagebrush steppe and western juniper (*Juniperus occidentalis*) woodland with sagebrush understory are common (Risser 2000). A variety of wetland and riparian plant communities, including forest, woodland, shrubland, wet meadow, and marsh, also are present in central Oregon.

The community types noted above are present in the Study Area, albeit in modified form due to historical and recent disturbances. Cattle grazing, non-native species introduction, fire, and other activities led to the partial degradation and/or transformation of plant communities that likely occupied the Study Area prior to European settlement. Russian thistle (*Salsola kali*), a non-native tumbleweed, and cheatgrass (*Bromus tectorum*), a pernicious non-native grass, are widespread throughout the Study Area. They are commonly found in both sagebrush steppe and western juniper woodlands that have been overgrazed and/or burned (Whitson et al. 1996; Rice and Randall 1999; Tirmenstein 1999). Also present is broom snakeweed (*Gutierrezia sarothrae*), a native shrub that tends to expand following overgrazing, fire, or drought and potentially suppresses sagebrush re-establishment (Ralphs 2011).

Non-native Russian olive (*Elaeagnus angustifolia*) dominates much of the on-site riparian areas. This fast-growing tree may eventually replace stands of native willows (*Salix* spp.) and cottonwoods (*Populus* spp.) (DiTomaso 2013). Other non-native species are also present within the Study Area's riparian and wetland areas, as discussed below.

B) SITE ALTERATIONS

Construction of the Carty Reservoir in the mid-1970s may have affected the presence, location, and boundaries of at least one of the potential waters of the State found in the Study Area. Historical channelization and road building associated with agricultural development also appear to have affected the geographic distribution of waters in the Study Area.

Carty Reservoir is an approximately 1,500-acre man-made impoundment constructed to provide cooling water, water for firefighting, and make-up water for the boiler to the Boardman Plant and other potential future energy-generating facilities constructed in the vicinity. The reservoir also receives processed wastewater (primarily cooling water) from the Boardman Plant; therefore, it is regulated by the Oregon Department of Environmental Quality as an industrial wastewater pond.

The western part of the Carty Reservoir extends across what had been a portion of Sixmile Canyon. All the wetlands and streams delineated in the Study Area in 2016 are located in a remaining portion of Sixmile Canyon north of the reservoir, at distances of 675 feet or more north of the reservoir embankment (Figure 3a).

Construction of the Carty Reservoir interrupted the hydrologic and ecological connectivity of the riparian area occupying the western part of Sixmile canyon in the Study Area. Waters within the eastern part of Sixmile Canyon in the Study Area may receive less surface water than they did prior to reservoir construction. The reduced water input may have led to a reduction in the geographic extent of wetlands within this portion of the canyon. In contrast, groundwater input to the western arm of the canyon may have increased due to the much greater hydrologic storage created by the reservoir. However, due to artificially created topographic constrictions (i.e., channelization and construction of road embankments), the geographic extent of the waters within the Study Area does not appear to have expanded.

In the western part of Sixmile Canyon in the Study Area, a dirt road runs parallel to a stream and its associated wetland. The embankment created for this road may prevent the stream and associated wetland from expanding or meandering eastward. Flow in this stream leads north through a channel that meanders in and out of the amended Site Boundary and leads northward toward the Columbia River.

Another stream is present in the eastern part of Sixmile Canyon within the Study Area. This stream supports ephemeral to intermittent flow within a channel containing sections that were artificially straightened. Stream flow leads south and west into the toe-ditch lining the north side of the reservoir embankment, or dam. Water from the stream infiltrates the ground below the toe-ditch.

No fill placement or removal has occurred within wetlands or other waters during the ongoing construction of the Carty Generating Station. The construction of the Boardman Plant in 1975 appears to have avoided fill placement or removal in waters, given its location on elevated ground and the lack of any naturally occurring riparian areas nearby. The potentially jurisdictional wetlands delineated in the Study Area are more than 0.3 mile (1,600 feet) west of the Carty Generating Station as originally proposed, and more than 0.5 mile (2,650 feet) west of the existing Boardman Plant. Additionally, vehicular traffic and other activities associated with operation of the Boardman Plant or construction of the Carty Generating Station as originally proposed have avoided impacts on waters.

C) PRECIPITATION DATA AND ANALYSIS

E & E analyzed precipitation data from the National Weather Service meteorological (met) station located in Boardman, Oregon, which is the met station closest to the Study Area. According to these data, precipitation in Boardman averages 8.51 inches per annum, with more than 50 percent occurring from November through February (NRCS n.d.).

Table C-1 summarizes precipitation data for the survey dates, as well as the preceding two weeks. Precipitation fell on one of the preceding 14 days, totaling 0.08 inch. No precipitation fell during the three days of the survey.

Table C-1 Precipitation Data from the Boardman, Oregon Meteorological Station for Survey Dates and Preceding Two Weeks

Date	Observed Precipitation (inches)
March 22, 2016	0.08
March 23, 2016	0
March 24, 2016	0
March 25, 2016	T*
March 26, 2016	0
March 27, 2016	0
March 28, 2016	0
March 29, 2016	T*
March 30, 2016	0
March 31, 2016	0
April 1, 2016	0
April 2, 2016	0
April 3, 2016	0
April 4, 2016	T*
April 5, 2016	**0.0**
April 6, 2016	**0.0**
April 7, 2016	**0.0**

* T = trace amount (<0.01 inch)

The Natural Resources Conservation Service (NRCS) National Water and Climate Center assesses precipitation data gathered at the Boardman meteorological (met) station to define thresholds for normal monthly precipitation. The NRCS provides monthly thresholds discerning normal precipitation from abnormal precipitation in the "WETS

Tables." Although data from this met station continue to be collected, the WETS Table for this station is based on data collected from 1971 through 2000.

In accordance with the method outlined in Section 650.1903 of the NRCS Engineering Field Handbook (NRCS 1997), E & E compared precipitation data for the months prior to and including the survey dates with WETS Table precipitation thresholds to determine whether these months exhibited Low, Normal, or High levels of precipitation. Refer to Table C-2 for comparisons of normal precipitation levels to the observed for January through March of 2016.

Table C-2 2016 Observed and Normal Precipitation from the Boardman, Oregon Meteorological Station for the Three Months up to and Including the Survey Dates.

Month	Observed for Month (inches)	30-year Average (1971–2000) for Month (inches)	30% Chance Less Than	30% Chance Less Than	Precipitation Level
January	1.55	1.19	0.69	1.44	High
February	0.46	0.91	0.48	1.11	Low
March	0.78	0.73	0.45	0.88	Normal

Note: Observed precipitation from April 1–7, 2016 = <0.01 inches

Table C-3 compares observed and normal (mean annual) precipitation for the water year, which begins October 1, for the three months preceding the survey. Cumulative precipitation by the end of March 2016, five days prior to the first day of the survey, was approximately 108 percent of the normal value for that time.

Table C-3 Cumulative Precipitation for Water Year

Month	Observed Cumulative Precipitation for Water Year (inches)	Percent of Normal Water Year Accumulation
January	4.28	119.9%
February	5.19	107.7%
March	5.91	107.8%

The combination of persistent extreme warmth and dryness throughout most of 2015 caused drought conditions across most of the western U.S., including Morrow County. However, the Palmer Hydrological Drought Index for March 2016 showed that water levels were at the mid-range point, indicating that central and eastern Oregon were no longer experiencing drought conditions (Fuchs 2016).

D) METHODS

Prior to the field delineation, E & E analyzed numerous available data sets to determine the locations of potential areas of jurisdiction. Digital basemaps were prepared with georeferenced aerial imagery dated 2010 and 2015, as well as ArcGIS layers, including Study Area boundaries, Soil Survey Geographic database (SSURGO 2017), National Hydrography Dataset (NHD 2013), and National Wetland Inventory (NWI 2013). In addition, E & E reviewed the Wetland Delineation Report and Addendum to the report submitted to DSL in support of the PGE Carty Generating Station Application for Site Certificate (E & E 2010, 2013).

Two E & E biologists conducted the on-site investigation on April 5–7, 2016. During the field investigation, E & E used a tablet computer that had the abovementioned basemaps uploaded and a wireless connection to a global positioning system (GPS) unit with sub-meter accuracy to navigate through the Study Area and digitally mark waters, data points, and other features. They noted and applied aerial photo signatures (e.g., characteristics including color and texture) of wetland and upland communities during the on-site GPS marking.

E & E used the routine on-site determination methods outlined in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (ELab 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region V2.0 (USACE 2008) to determine the presence and absence of wetlands. E & E derived additional guidance from review of the DSL delineation report requirements on their Technical Resources website (DSL 2016).

The E & E biologists established plots in areas mapped as wetland by NWI, in areas that exhibited indicators of potential wetland presence, and in wetlands observed found on site. Wetland plots were paired with plots established in adjacent uplands. Upland plots were placed in proximity to their paired wetland plots sufficient to substantiate wetland/upland boundaries.

The E & E biologists identified vascular plants to species in each plot with nomenclature used by the Biota of North America Program (BONAP) database (Kartesz 2015). They determined the wetland indicator status of each plant species using The National Wetland Plant List (Lichvar et al. 2014).

E & E documented and delineated non-wetland waters along their ordinary high water mark (OHWM) in accordance with the USACE (2005) Regulatory Guidance Letter 05-05. They determined the flow regime of each stream (ephemeral, intermittent, or perennial) with guidance from the January 15, 2002, Federal Register Notice regarding

the Issuance of Nationwide Permits (USACE 2002) and the Streamflow Duration Assessment Method for Oregon (SDAM) (Nadeau 2011).

The E & E biologists marked the boundaries of wetlands and other waters in the field via sub-meter GPS (Geneq iSXBlue II), with real-time correction. The GPS was linked via Bluetooth to iPad tablets, which enabled access to satellite imagery and a full range of basemap features to improve field navigation and photo interpretation during the field survey. E & E used the information gathered during the field investigation, including the correlation between aerial photo signature and landscape features, to guide the delineation.

E) DESCRIPTION OF WETLANDS AND NON-WETLAND WATERS

The E & E biologists identified three wetlands, two streams, and one artificially created pond (sewage lagoon) in the Study Area (Figures 3a and 3b). The wetlands and streams were north of the Carty Reservoir northern dam embankment, between the Grassland Switchyard and the Boardman plant. Both streams were located within the recorded wetlands. The artificially created pond is used for sewage treatment and is located within the coal loop approximately 0.25 mile northeast of the Boardman plant. Of these features, only the sewage lagoon is located within the Carty Solar Farm; however, it does not lie within an area of proposed ground disturbance (Figures 3a and 4). The wetlands and streams are all located adjacent to, but not within, potential disturbance areas for the Carty Solar Farm.

Datasheets documenting the presence and character of the wetlands and uplands within the Study Area are presented in Attachment A. Datasheets documenting the evidence of intermittent and ephemeral sections of one stream (associated with Wetland H1-2016) are presented in Attachment B. Figures depicting project features, the location and geographic extent of waters, and other supporting information are provided in Attachment C. Attachment D contains a photo log that includes photos of each sample plot, including site vegetation and the soil profile, as well as photos of each reference point, which do not include soil profile photos or data. Figure 4 shows the locations and view directions of each site photo.

E-1) Wetlands

Wetland H1-2016

Wetland H1-2016 is a narrow wetland situated within an artificially modified channel located approximately 60 feet southwest of Wetland H2-2016. This feature was identified as Wetland H1 in the previous wetland delineation report (E & E 2010, 2013). The 2016 survey slightly modified the previously delineated boundary.

This wetland is approximately 12 to 15 feet wide and extends both north and south of the Study Area. It is situated within an artificially steepened channel that is 18 to 20 feet wide at the top of the bank. The side-slopes are at a 1:1 angle or steeper and rise approximately 4 feet above the bottom of the swale. The channel and the wetland within it are pitched to the south at approximately 0.5 percent, and extend off site in the same direction. A small stream (discussed in more detail in Section E-2) leads through the center of the wetland.

Wetland H1-2016 is a Palustrine emergent community with persistent vegetation and apparently seasonal saturation (PEM1B). Vegetation is dominated by common cattail (*Typha latifolia*), but a few other species with relatively low cover also are present. Most of the soil profile is fine sandy loam with a chroma of 3 and without redoximorphic (redox) features. Soil saturation was found at and below 3.5 inches below ground surface (bgs) and free-standing water was evident in the soil pit at 9.5 inches bgs. Due to the strong indicators of hydrophytic vegetation and wetland hydrologic regime (seasonal ponding), E & E considers the soil to be hydric per the procedure for difficult situations described in the Regional Supplement. The data plot used to sample this wetland was recorded as WP-GM-11 (Figure 3b).

Wetland H2-2016

Wetland H2 is a small wetland located in the eastern part of Sixmile Canyon, described in Section B. This feature was identified as Wetland H-2 in the previous wetland delineation report (E & E 2010, 2013). The 2016 survey delineated a slightly modified boundary.

The wetland is within a nearly circular, approximately 2-foot-deep depression with no outlet situated in an otherwise flat riparian area. According to the Cowardin classification system (Cowardin et al. 1979), it is a Palustrine emergent community with persistent vegetation and apparently seasonal inundation (PEM1C). Hardstem club-rush (*Schoenoplectus acutus*) dominates Wetland H2-2016 entirely. Silt loam soil emanated a hydrogen sulfide odor upon excavation. Surface water to an approximately 3-inch depth was present during the investigation.

Areas adjacent to Wetlands H1-2016 and H2-2016 are distinguished as uplands by the lack of any wetland indicators. This upland community is upon the relatively flat terrace surrounding the wetlands and associated stream. Vegetation in this community is a patchy mix of Russian olive (*Eleaegnus angustifolia*) and areas dominated by Mexican fireweed (also known as kochia) (*Bassia scoparia*) and lamb's quarters (*Chenopodium album*). The soil, which was relatively dry during the investigation, exhibited a small amount of redox features, but not in sufficient quantity to meet the threshold for hydric soils. The data plot used to sample this wetland was recorded as WP-GM-9 (Figure 3b)

Wetland B-2016

Wetland B-2016 is a wetland swale that surrounds an intermittently flowing stream. The wetland and the stream extend off site to the north. This feature was identified as Wetland B in the previous wetland delineation report (E & E 2010, 2013). The 2016 survey delineated a slightly modified boundary.

The width of Wetland B-2016 varies from 30 to 50 feet. The wetland swale is pitched to the northeast at approximately 0.5 percent, and it extends off site in the same direction. A small intermittent stream (discussed in more detail in Section E-2) leads through the center of the wetland.

Wetland B-2016 is a Palustrine scrub-shrub community with seasonal inundation (PSSC). Vegetation is dominated by Russian olive, an unidentified species of willow, climbing nightshade (*Solanum dulcmara*), and common cattail. The soil profile is sandy loam with a muck surface layer 2.5 inches thick. E & E observed up to 2 inches of surface water in the stream and free-standing water in the soil pit at 6 inches bgs. The data plot used to sample this wetland was recorded as WP-GM-13 (Figure 3b).

Areas adjacent to Wetland B-2016 are distinguished as uplands by the lack of any wetland indicators. The upland community immediately east of the wetland entails a dirt road and moderately graded (20 to 30 percent slopes) road shoulder. Vegetation in the road shoulder community is dominated by cheatgrass, with a few other herbaceous and mostly weedy species. The soil exhibited high chroma and no redox features. No indicators of wetland hydrology were observed in the upland areas; the soil sampled was relatively dry during the investigation.

E-2) Non-Wetland Waters

Stream within Wetland H1-2016

A small stream runs southward through the artificially straightened channel that contains Wetland H1-2016. The stream extends north and south of the Study Area (Figure 3b).

There are two sections of the stream that are very distinct from one another. Vegetation in the upper section of the channel, situated up-gradient and north of Wetland H1-2016, is somewhat sparse (total cover below 50 percent) and primarily comprised of kochia and tall fescue (*Schedonorus arundinaceus*). In contrast, vegetation in the lower section of the stream, situated within Wetland H1-2016, is moderately thick and dominated by common cattail. No common cattail or other obligate wetland species are situated in the upper section of the channel and very little kochia or other facultative species are situated in the lower section of the channel.

The stream's OHWM is fairly well defined in the stream's upper section, where it is approximately 8 feet wide within the Study Area, and not well defined within Wetland H1-2016. Criteria used to delineate the stream's upper section as separate from the adjacent upland included the relatively coarse substrate, topographic breaks and limited plant cover. In contrast, criteria used to delineate the stream's lower section included the extent of hydrophytic vegetation and topographic breaks. The OWHM of the lower portion of the stream is entirely within the boundaries of Wetland H1-2016.

Application of the SDAM decision tree (Nadeau 2011) leads to the conclusion that the upper section of this stream supports an ephemeral flow regime, meaning that flow occurs for only a few days per year during and shortly after large storms. This portion of the stream contained relatively dry substrate and exhibited no flow and little evidence of recent flow during the investigation. Although the channel gradient is very gentle (much less than 10.5 percent), neither hydrophytic vegetation nor aquatic macroinvertebrates were present in the upper part of the stream.

Application of the SDAM decision tree (Nadeau 2011) leads to the conclusion that the lower section of this stream supports an intermittent flow regime. Although there was no surface or subsurface flow during the survey, this portion of the stream contained saturated soil and free standing water at 9.5 inches bgs. Hydrophytic vegetation is predominant, and the gradient of the channel is very gentle (much less than 10.5 percent). There was no evidence of fish present.

The stream flows south of the Study area into the toe-ditch lining the north side of the reservoir embankment, or dam. Water from the stream infiltrates the ground below the toe-ditch.

Stream within Wetland B-2016

As mentioned above, a small stream runs through the center of Wetland B-2016. The stream is a tributary to the stream leading north through Sixmile Canyon (Figure 3b).

Clear water appeared to emanate from near the southern edge of the wetland. During the survey, E & E estimated the flow at less than 0.2 cubic feet per second. The stream's substrate is muck and mineral soil. Criteria used to delineate this stream as separate from the encompassing wetland include the presence of flowing water, evidence of fluvial erosion/deposition, and relatively limited presence of plants.

This stream supports an intermittent flow regime, meaning that flow occurs for several days to weeks after large storms but does not flow throughout the year. As indicated above, flow was occurring during the survey despite the lack of any recent rainfall. No aquatic macroinvertebrates were observed. A prevalence of hydrophytic vegetation was present, and the gradient of the channel is very gentle (much less than 10.5 percent). Pacific tree frogs (*Pseudacris regilla*) were observed to inhabit the waterbody. There was no evidence of fish present.

Artificially Created Pond (Sewage Lagoon)

The Study Area traverses the southernmost of three artificially created ponds (sewage lagoons) located in the coal loop northeast of the coal plant. As with the other two ponds, the southernmost pond is lined with thick black plastic sheeting, situated within steeply sloping, artificially created depressions, and hydrologically isolated (no outlets or inlets present). Although the E & E biologists could not observe the pond closely due to a chain-link fence approximately 100 feet from the water's edge, they observed 12 bufflehead (*Bucephala albeola*) in the pond during the survey.

F) DEVIATION FROM LWI OR NWI

The NWI indicates a Palustrine emergent, seasonally flooded wetland with persistent vegetation (PEM1C) extending into both the western and eastern parts of Sixmile Canyon, north of the northern Carty Reservoir dam embankment in the western part of the Study Area (Figure 5). The NWI-mapped wetland appears as a narrow slough originating in the location of Wetland B-2016 and meandering east for about 0.5 mile until expanding into an oblong-shaped feature approximately 250 feet wide and 1,200 feet long in the vicinity of Wetlands H1-2016 and H2-2016.

Neither the NWI nor the NHD dataset showed any mapped streams in the Study Area, including in the location of the narrow slough mapped by NWI.

As demonstrated by this report, the on-site wetlands comprise two Palustrine emergent wetlands and one Palustrine scrub-shrub wetland. These wetlands are not interconnected by a narrow PEM1C wetland as mapped by NWI. Furthermore, there are two streams in the Study Area as described above.

G) MAPPING METHOD

As mentioned in Section D, E & E marked wetland boundaries in the field using a sub-meter GPS (Geneq iSXBlue II), which provided real-time correction. The GPS was linked via Bluetooth to iPad tablets, which enabled access to satellite imagery and a full range of basemap features to improve field navigation and photo interpretation during the field survey. E & E used the information gathered during the field investigation, including the correlation between aerial photo signature and landscape features, to guide the mapping process.

H) ADDITIONAL INFORMATION

Soils

Nine soil map units are present in the Study Area (Figure 6), as indicated by the Web Soil Survey. None of these soil types possesses any components that are listed as hydric soils by the National Technical Committee for Hydric Soils. Each of the nine soil map units is entirely non-hydric.

I) RESULTS AND CONCLUSIONS

E & E delineated three wetlands, two streams, and one artificially created pond (sewage lagoon) in the Study Area.

J) DISCLAIMER

This report documents the investigation, best professional judgment, and conclusions of the investigator. It is correct and complete to the best of my knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with Oregon Administrative Rules 141-090-0005 through 141-090-0055.

K) REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBL-79/31. U.S. Fish and Wildlife Service. Washington, D.C.

Crowe, E.A., B.L. Kovalchik, and M. Kerr. 2004. Riparian and Wetland Vegetation of Central and Eastern Oregon. Oregon State University, Portland, Oregon. http://www.oregon.gov/OWEB/docs/pubs/crowe2004.pdf

DSL (Oregon Department of State Lands). No Date. Wetland Determination/Delineation Reports Requirements Checklist. http://www.oregon.gov/dsl/WW/Documents/wetland_delin_rpt_chklist.pdf. . Accessed January 19, 2016

DiTomaso, J. 2013. Weed Control in Natural Areas in the Western United States. UC Davis Weed Research and Information Center. Davis, California.

EPA (U.S. Environmental Protection Agency). 2010. Interactive EPA Ecoregions Map for Oregon. 2010 plantmaps.com. http://www.plantmaps.com/interactive-oregon-ecoregions-l4-map.php Accessed January 12, 2016

ELab (Environmental Laboratory). 1987. U.S. Army Corps of Engineers Wetland Delineation Manual. (Technical Report Y-87-1). U.S. Army Waterways Experimental Station. Vicksburg, Mississippi.

E & E (Ecology and Environment, Inc.). 2013. 2013 Addendum to the Wetland Delineation Report for the Carty Generating Station. Submitted to Oregon Department of State Lands in September 2013 in support of the PGE Carty Generating Station Application for Site Certificate. Portland, Oregon

_____. 2010. Wetland Delineation Report. PGE Carty Generating Station Application for Site Certificate. Portland, Oregon

Fuchs, B. 2018. U.S. Drought Monitor. National Drought Mitigation Center. U.S. Department of Agriculture. http://droughtmonitor.unl.edu/ Accessed May 5, 2016.

Kartesz, J.T. 2015. The Biota of North America Program (BONAP). North American Vascular Flora. Taxonomic Data Center. Chapel Hill, North Carolina. http://www.bonap.org Accessed January 18, 2016

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. Phytoneuron 2014-41: 1–42.

McKnight, Tom L; Hess, Darrel (2000). Climate Zones and Types. In: Physical Geography: A Landscape Appreciation. Upper Saddle River, NJ: Prentice Hall. ISBN 0-13-020263-0.

NHD (National Hydrography Dataset). 2013. U.S. Geological Survey (USGS). National Hydrography Geodatabase: The National Map viewer available on the World Wide Web http://datagateway.nrcs.usda.gov Accessed March 2016

NRCS (Natural Resources Conservation Service). Not Dated. Agricultural Climate Information System. Field Office Technical Guide. U.S. Department of Agriculture. https://efotg.sc.egov.usda.gov/treemenuFS.aspx. Accessed January 24, 2017.

NWI (National Wetlands Inventory). 2013. U. S. Fish and Wildlife Service. Publication date October 18, 2013. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/ Accessed January 2018.

Nadeau, T.L. 2011. Streamflow Duration Assessment Method for Oregon, U.S. Environmental Protection Agency, Region 10, Document No. EPA 910-R-11-002.

Ralphs, M.H. 2011. Broom Snakeweed Increase and Dominance in Big Sagebrush Communities. Natural Resources and Environmental Issues, Vol. 17 [2011], Art. 8

Rice, B.M. and J. Randall, compilers. 1999. Weed Report: *Bromus tectorum*-cheatgrass. In: Wildland Weeds Management and Research: 1998–1999 Weed Survey. Davis, CA: The Nature Conservancy, Wildland Invasive Species Program. 8 p. On file with: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, Missoula, Montana.

Risser, P. 2000. Oregon State of the Environment Report 2000. Statewide Summary. Oregon Progress Board. http://oregonstate.edu/dept/eoarc/sites/default/files/publication/490.pdf. Accessed January 24, 2018.

SSURGO (Soil Survey Geographic Database). 2017. Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. Accessed February 1, 2018

Taylor, G., C. Hale, and S. Jobs. 2016. Climate of Umatilla County. http://www.ocs.oregonstate.edu/county_climate/Umatilla_files/Umatilla.html Accessed May 5, 2016

Thorson, T.D., S.A. Bryce, D.A. Lammers, A.J. Woods, J.M. Omernik, J. Kagan, D.E. Pater, and J.A. Comstock. 2003. Ecoregions of Oregon (color poster with map,

descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Tirmenstein, D, 1999. *Chrysothamnus viscidiflorus*. In: Fire Effects Information System, [Online]. USDA-Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).

USACE (United States Army Corps of Engineers). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____.2005. Regulatory Guidance Letter 05-05. Ordinary High Water Mark Identification. http://www.usace.army.mil/Portals/2/docs/civilworks/RGLS/rgl05-05.pdf. Access January 25, 2018.

_____.2002. Issuance of Nationwide Permits; Notice. Federal Register. Part II Department of Defense. Department of the Army, Corps of Engineers. https://www.gpo.gov/fdsys/pkg/FR-2002-01-15/pdf/02-539.pdf. Accessed January 25, 2018.

Whitson, T.D., L.C. Burrill, S.A. Dewey, D.W. Cudney, B.E. Nelson, R.D. Lee, and R. Parker. 1996. Weeds of the West. Pioneer of Jackson Hole, Jackson, Wyoming. 630p.

ATTACHMENT A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/6/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-4
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 2, T2N, R24E
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 1
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.680026 Long: -119.787539 Datum: WGS84
Soil Map Unit Name: Sagehill fine sandy loam, 2 to 5 percent slopes NWI classification Other
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? No
Are "Normal Circumstances" present? Yes ☑ No ☐
(If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Upland riparian forest community

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:30.0)	Absolute Cover %	Dominant Species?	Indicator Status
Populus balsamifera	20.0	Yes	FAC
	20.0	= Total Cover	
Sapling/Shrub Stratum (Plot size:30.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Elaeagnus angustifolia	2.0	Yes	FAC
Artemisia tridentata	1.0	No	NL*
Juniperus communis	5.0	Yes	FACU
	8.0	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Holosteum umbellatum	25.0	Yes	NL
Achillea millefolium	1.0	No	FACU
Bromus tectorum	25.0	Yes	NL
	51.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
		= Total Cover	

% Bare Ground in Herb Stratum 25 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	0.0%	x1	0.00%
FACW Species	0.0%	x2	0.00%
FAC Species	22.0%	x3	66.00%
FACU Species	1.0%	x4	4.00%
UPL Species	50.0%	x5	250.00%
Column Totals	79.0% (A)		320.00 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: *NL = Not listed species; considered UPL.

Balsam poplar woodland with moderate cover in understory.

SOIL

Sampling Point: CGE-WP-GM-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	2.5YR 3/2	100					Loamy Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: As determined by examining soil profile, fairly dry within 0 to 11 inches bgs, and fairly moist within 11 to 18 inches bgs. No saturation or any other indicators of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/7/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-5
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 2, T2N, R24E
Landform (hillslope, terrace, etc.): Channel/Canal (active) Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.688253 Long: -119.788325 Datum: WGS84
Soil Map Unit Name: Sagehill fine sandy loam, 2 to 5 percent slopes NWI classification UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? No Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Upland, artificially-created ditch with no evidence of recent flow

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:60.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Elaeagnus angustifolia	4.0		FAC
	4.0	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Schedonorus arundinaceus	65.0	Yes	FAC
Lepidium perfoliatum	1.0		FACU
Salsola tragus	1.0		FACU
Bassia hyssopifolia	30.0	Yes	FAC
Bromus tectorum	10.0		NL
	107.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
	0	= Total Cover	

% Bare Ground in Herb Stratum 5 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:	
OBL Species	0.0%	x1	0.00%	
FACW Species	0.0%	x2	0.00%	
FAC Species	99.0%	x3	297.00%	
FACU Species	2.0%	x4	8.00%	
UPL Species	10.0%	x5	50.00%	
Column Totals	111.0%	(A)	355.00	(B)

Prevalence Index = B/A = 3.20

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?	Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: CGE-WP-GM-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 9	2.5Y 3/2	100					Sandy Loam (Regular)	
9 - 13	2.5Y 3/2	95	10YR 5/6	5	C	M	Sandy Loam (Regular)	Some gravels & cobbles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock (cobble)

Depth (inches): 13.0

Hydric Soil Present? Yes ☐ No ☑

Remarks: No indicators of hydric soil present. Shovel refusal at 13 inches bgs due to underlying layer of predominantly cobbles including a few quarry spalls.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soil fairly moist, but not saturated. No evidence of recent flow or inundation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/7/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-6
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 35, T3N, R24E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.693271 Long: -119.789659 Datum: WGS84
Soil Map Unit Name: Sagehill fine sandy loam, 2 to 5 percent slopes NWI classification
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? No Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Plot situated within a shallowly depressed area that has received a minor amount of coal ash deposition. No wetland indicators present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	= Total Cover		
Sapling/Shrub Stratum (Plot size:30.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Elaeagnus angustifolia	15.0	Yes	FAC
Gutierrezia sarothrae	5.0	No	NL
	15.0	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Poa secunda	1.0	No	FACU
Salsola tragus	25.0	Yes	FACU
Sisymbrium altissimum	10.0	Yes	FACU
	36.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
	= Total Cover		

% Bare Ground in Herb Stratum 40 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	0.0%	x1	0.00%
FACW Species	0.0%	x2	0.00%
FAC Species	15.0%	x3	45.00%
FACU Species	36.0%	x4	144.00%
UPL Species	5.0%	x5	25.00%
Column Totals	56.0% (A)		214.00% (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: Somewhat sparsely vegetated. Plant community is not hydrophytic.

SOIL

Sampling Point: CGE-WP-GM-6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 1	2.5Y 2.5/1	100					Sandy Loam (Regular)	Upper-most layer black from coal ash
1 - 5	10YR 2/2	100					Loamy Sand	
5 - 18	10YR 3/3	100					Sandy Loam (Regular)	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks: Coal ash within upper-most layer. No indicators of hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☑ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Drift deposits across approximately 10 percent of the plant community. Site appears to support occasional inundation, but does not appear to support inundation or saturation sufficient to exhibit any other indicators of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/7/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-7
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 2
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.692936 Long: -119.811454 Datum: WGS84
Soil Map Unit Name: Sagehill fine sandy loam, 2 to 5 percent slopes NWI classification L1UBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? No Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Upland riparian forest. Stand of eastern cottonwood in proximity to Carty Reservoir.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:30.0)	Absolute Cover %	Dominant Species?	Indicator Status
Populus deltoides	25.0	Yes	FAC
	25.0	= Total Cover	
Sapling/Shrub Stratum (Plot size:30.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Artemisia cana	7.5	Yes	FACU
	7.5	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Bromus tectorum	50.0	Yes	NL
	50.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
		= Total Cover	

% Bare Ground in Herb Stratum 15 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	0.0%	x1	0.00%
FACW Species	0.0%	x2	0.00%
FAC Species	25.0%	x3	75.00%
FACU Species	7.5%	x4	30.00%
UPL Species	50.0%	x5	250.00%
Column Totals	82.5% (A)		305.00 (B)

Prevalence Index = B/A = 4.30

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: Plant community is not hydrophytic. Some trace amount of Gutierrezia sarothrae and a few dead-standing poplars also present.

SOIL

Sampling Point: CGE-WP-GM-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	**Color (moist)**	**%**	**Color (moist)**	**%**	**Type[1]**	**Loc[2]**	**Texture**	**Remarks**
0 - 18	2.5Y 3/3	100					Sandy Loam (Regular)	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks: No indicators of hydric soil present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators of wetland hydrology. Soil profile is fairly moist, but not saturated.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/7/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-8
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.693488 Long: -119.815388 Datum: WGS84
Soil Map Unit Name: Sagehill fine sandy loam, 2 to 5 percent slopes NWI classification L1UBHh
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? No
Are "Normal Circumstances" present? Yes ☑ No ☐
(If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Plot situated in an area that receives occasional overflow from Carty Reservoir. Area appears to have been graded flat several years ago. No wetland indicators present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:30.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Artemisia annua	2.0	Yes	UPL
Elaeagnus angustifolia	2.0	Yes	FAC
	4.0	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Bromus tectorum	80.0	Yes	NL
Cerastium arvense	5.0	No	FACU
Deschampsia caespitosa	20.0	Yes	FACW
	105.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
	0	= Total Cover	

% Bare Ground in Herb Stratum 1 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	0.0%	x1	0.00%
FACW Species	20.0%	x2	40.00%
FAC Species	2.0%	x3	6.00%
FACU Species	5.0%	x4	40.00%
UPL Species	82.0%	x5	410.00%
Column Totals	109.0% (A)		496.00 (B)

Prevalence Index = B/A = 4.55

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: Plant community is not hydrophytic.

SOIL

Sampling Point: CGE-WP-GM-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 9.5	2.5Y 4/3	100					Loam	
9.5 - 11	2.5Y 3/3	85	10YR 4/6	15	C	M	Sandy Loam (Fine)	Cemented peds

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Cemented layer

Depth (inches): 11.0

Hydric Soil Present? Yes ☐ No ☑

Remarks: No evidence of hydric soil. Shovel refusal at 11 inches bgs due to cemented peds.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators of wetland hydrology. Soil fairly moist, but not saturated.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-9
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.696401 Long: -119.819215 Datum: WGS84
Soil Map Unit Name: Royal silt loam, 0-3% slopes NWI classification PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐
Hydric Soil Present? Yes ☑ No ☐
Wetland Hydrology Present? Yes ☑ No ☐

Is the Sampled Area within a Wetland? Yes ☑ No ☐

Remarks: Small depressional area with standing water, hydrophytic vegetation and steep side-slopes

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Herb Stratum (Plot size:10.0)	Absolute Cover %	Dominant Species?	Indicator Status
Schoenoplectus acutus	100.0	Yes	OBL
	100.0	= Total Cover	
Woody Vine Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:	
OBL Species	100.0%	x1	100.00%	
FACW Species	0.0%	x2	0.00%	
FAC Species	0.0%	x3	0.00%	
FACU Species	0.0%	x4	0.00%	
UPL Species	0.0%	x5	0.00%	
Column Totals	100.0%	(A)	100.00	(B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%
☑ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: Vegetation entirely dominated by hardstem bulrush. All stems are dead-standing, but presumably rhizomes and roots are alive.

SOIL

Sampling Point: CGE-WP-GM-9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	2.5Y 3/2						Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks: Soil is fine silt loam somewhat loosely consolidated. Hydrogen sulfide odor evident.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3.0

Water Table Present? Yes ☑ No ☐ Depth (inches): 0.0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0.0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No outlet. Standing water likely persists through spring of most years.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-10
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.696362 Long: -119.819306 Datum: WGS84
Soil Map Unit Name: Royal silt loam, 0-3% slopes NWI classification PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Plot located in terrace west of the pocket wetland sampled by WP-GM-9

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
Artemisia cana	5	Yes	FACU
	5	= Total Cover	
Herb Stratum (Plot size:10.0)	Absolute Cover %	Dominant Species?	Indicator Status
Schedonorus arundinacea	15.0	No	FACU
Bassia hyssopifolia	45.0	Yes	FAC
Sphaerophysa salsula	10.0	No	FACU
Chenopodium album	20.0	Yes	FACU
	90.0	= Total Cover	
Woody Vine Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	

% Bare Ground in Herb Stratum 5 % Cover Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:	
OBL Species	0.0%	x1	0.00%	
FACW Species	0.0%	x2	0.00%	
FAC Species	45.0%	x3	135.00%	
FACU Species	50.0%	x4	200.00%	
UPL Species	0.0%	x5	0.00%	
Column Totals	95.0%	(A)	335.00	(B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: Many dead-standing Artemisia tridentata. Vegetation is not hydrophytic

SOIL

Sampling Point: CGE-WP-GM-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12.5	10YR 3/2	98	7.5YR 4/6	2	C	M	Loam	Fairly moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: Rock
Depth (inches): 12.5

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present. Soil is moist, not saturated.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-11
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Channel/Canal (active) Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.696170 Long: -119.819385 Datum: WGS84
Soil Map Unit Name: Royal silt loam, 0-3% slopes NWI classification PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐
Hydric Soil Present? Yes ☑ No ☐
Wetland Hydrology Present? Yes ☑ No ☐

Is the Sampled Area within a Wetland? Yes ☑ No ☐

Remarks: Ditch/swale wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Herb Stratum (Plot size:10.0)	Absolute Cover %	Dominant Species?	Indicator Status
Typha latifolia	90.0	Yes	OBL
Bassia hyssopifolia	5.0		FAC
	95.0	= Total Cover	
Woody Vine Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	90.0%	x1	90.00%
FACW Species	0.0%	x2	0.00%
FAC Species	5.0%	x3	15.00%
FACU Species	0.0%	x4	0.00%
UPL Species	0.0%	x5	0.00%
Column Totals	95.0% (A)		105.00 (B)

Prevalence Index = B/A = 1.11

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%
☑ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: Vegetation is strongly dominated by common cattail.

SOIL

Sampling Point: CGE-WP-GM-11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 1	10YR 2/1	100					Silt Loam	
1 - 14	10YR 3/3	93	5YR 4/6	3	C	M	Fine Sandy Loam	redox
			10YR 4/1	4	C	M		depletions

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rocky layer

Depth (inches): 14

Hydric Soil Present? Yes ☑ No ☐

Remarks: Problematic hydric soil. Recently developed wetland as a result of ditch excavation. Recently developed wetlands often lack hydric soil indicators because they have not been in place long enough to develop such indicators. Some redox and depletions in patchy distribution within the lower horizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☑ No ☐ Depth (inches): 9.5

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches):

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of recent flow, but near-surface saturation present and likely persists for several weeks during the early part of the growing season in a year with normal hydrological conditions.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-12
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.696147705 Long: -119.819433379 Datum: WGS84
Soil Map Unit Name: Royal silt loam, 0-3% slopes NWI classification PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Elaeagnus angustifolia	7.0	Yes	FAC
	7.0	= Total Cover	
Herb Stratum (Plot size:10.0)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
Schedonorus arundinacea	10.0	No	FACU
Bassia hyssopifolia	70.0	Yes	FAC
Chenopodium album	5.0	No	FACU
	85.0	= Total Cover	
Woody Vine Stratum (Plot size:)	**Absolute Cover %**	**Dominant Species?**	**Indicator Status**
	0	= Total Cover	

% Bare Ground in Herb Stratum 5.0 % Cover Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:	
OBL Species	0.0%	x1	0.00%	
FACW Species	0.0%	x2	0.00%	
FAC Species	77.0%	x3	231.00%	
FACU Species	15.0%	x4	60.00%	
UPL Species	0.0%	x5	0.00%	
Column Totals	92.0%	(A)	291.00	(B)

Prevalence Index = B/A = 3.16

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: Riparian vegetation

SOIL

Sampling Point: CGE-WP-GM-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	**Color (moist)**	**%**	**Color (moist)**	**%**	**Type[1]**	**Loc[2]**	**Texture**	**Remarks**
0 – 16.0	10YR 3/2	100					Loam	Somewhat moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-13
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.694536 Long: -119.826774 Datum: WGS84
Soil Map Unit Name: Taunton fine sandy loam, 5-12% slopes NWI classification PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☑ No ☐
Hydric Soil Present? Yes ☑ No ☐
Wetland Hydrology Present? Yes ☑ No ☐

Is the Sampled Area within a Wetland? Yes ☑ No ☐

Remarks: Riparian wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:30.0)	Absolute Cover %	Dominant Species?	Indicator Status
Elaeagnus angustifolia	20.0	Yes	FAC
Salix lasiandra	35.0	Yes	FACW
	55.0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
Salix lasiandra	5.0	Yes	FACW
	5.0	= Total Cover	
Herb Stratum (Plot size:10.0)	Absolute Cover %	Dominant Species?	Indicator Status
Callitriche heterophylla	1.0	No	OBL
Solanum dulcamara	5.0	Yes	FAC
Typha latifolia	2.0	No	OBL
Chamaenerion latifolium	3.0	No	FACW
Agrostis stolonifera	5.0	Yes	FAC
Bassia scoparia	5.0	Yes	FAC
	21.0	= Total Cover	
Woody Vine Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0.0	= Total Cover	

% Bare Ground in Herb Stratum 40 % Cover Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:
OBL Species	3.0%	x1	3.00%
FACW Species	43.0%	x2	86.00%
FAC Species	35.0%	x3	105.00%
FACU Species	0.0%	x4	0.00%
UPL Species	0.0%	x5	0.00%
Column Totals	81.0% (A)		194.00 (B)

Prevalence Index = B/A = 2.40

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%
☑ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: Much bare ground under the shade of the Russian olive and Pacific willow, which are both rooted in the wetland swale.

SOIL

Sampling Point: CGE-WP-GM-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2.5	10YR 3/2	100					Mucky Mineral	
2.5 - 12	2.5Y 4/1	100					Sandy Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☑ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☑ No ☐

Remarks: Hemic material at surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2.0

Water Table Present? Yes ☑ No ☐ Depth (inches): 6.0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 2.0

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Shallow inundation and flow in portions of the plot, but most of the plot and the associated community has near-surface saturation.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Carty Gen Expansion City/County: Morrow Sampling Date: 4/8/2016
Applicant/Owner: PGE State: OR Sampling Point: CGE-WP-GM-14
Investigator(s): Greg Mazer, Rachel Locke Section, Township, Range: Section 33, T3N, R24E
Landform (hillslope, terrace, etc.): Bench Local relief (concave, convex, none): Flat Slope (%): 1
Subregion (LRR): B – Columbia/Snake River Plateau Lat: 45.694481 Long: -119.826682 Datum: WGS84
Soil Map Unit Name: Taunton fine sandy loam, 5-12% slopes NWI classification UPL
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☑
Hydric Soil Present? Yes ☐ No ☑
Wetland Hydrology Present? Yes ☐ No ☑

Is the Sampled Area within a Wetland? Yes ☐ No ☑

Remarks: Compacted two-track trail/dirt road adjacent to riparian wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	
Herb Stratum (Plot size:50.0)	Absolute Cover %	Dominant Species?	Indicator Status
Bromus tectorum	50.0	Yes	FACU
Hieracium umbellatum	10.0	No	FACU
Trifolium variegatum	5.0	No	FAC
Penstemon sp.	1.0	No	NL
Taraxacum officinale	1.0	No	FACU
	67.0	= Total Cover	
Woody Vine Stratum (Plot size:)	Absolute Cover %	Dominant Species?	Indicator Status
	0	= Total Cover	

% Bare Ground in Herb Stratum 33.0 % Cover Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply By:	
OBL Species	0.0%	x1	0.00%	
FACW Species	0.0%	x2	0.00%	
FAC Species	5.0%	x3	15.00%	
FACU Species	60.0%	x4	240.00%	
UPL Species	0.0%	x5	0.00%	
Column Totals	65.0%	(A)	255.00	(B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%
☐ Prevalence Index is ≤3.0[1]
☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: Vegetation is dominated by weedy herbs.

SOIL

Sampling Point: CGE-WP-GM-14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
Inches	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/3	100					Sandy Loam (Regular)	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type: Rock
Depth (inches): 12

Hydric Soil Present? Yes ☐ No ☑

Remarks: Compacted soil with rocky subhorizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B12) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):

Water Table Present? Yes ☐ No ☑ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No indicators of wetland hydrology.

ATTACHMENT B

Streamflow Duration Field Assessment Forms

Streamflow Duration Field Assessment Form

Project # / Name	Carty ASC Amendment #1	Assessor	Greg Mazer & Rachel Locke
Address	Morrow County, Oregon - Carty Generating Station	Date	4/7/16
Waterway Name	Stream in Wetland B	Coordinates at downstream end (ddd.mm.ss)	Lat. N
Reach Boundaries	(lower section)		Long. W
Precipitation w/in 48 hours (cm)	0	Channel Width (m)	3
		☐ Disturbed Site / Difficult Situation (Describe in "Notes")	

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants (and indicator status):

Typha latifolia (OBL)

~~Bassia scoparia (FAC)~~

Bassia scoparia is not present, but not a FACW, OBL or SAV species

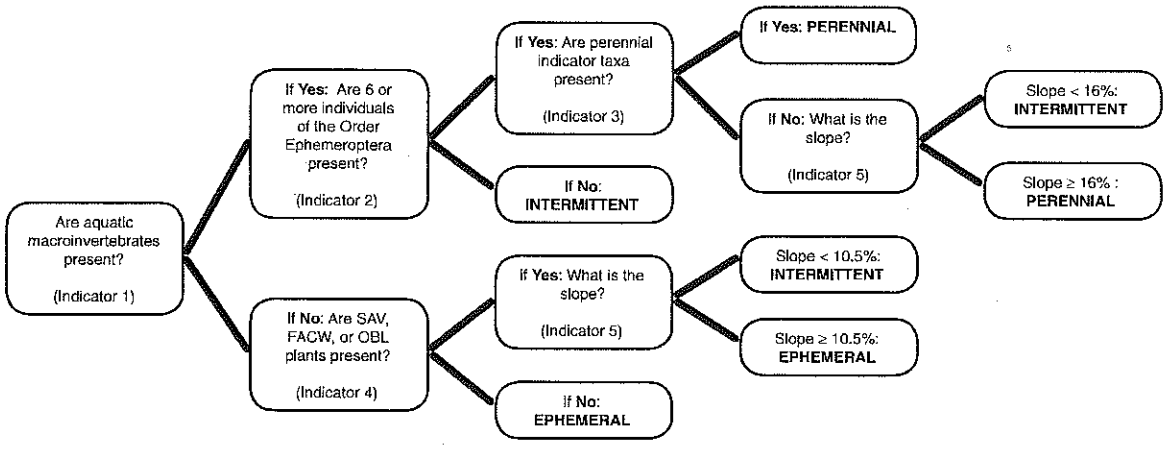
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemer-optera?	# of Individuals
none			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☒ Yes	☐ No
5. What is the slope? (In percent, measured for the valley, not the stream)	0.5 %	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☐ Ephemeral

☒ Intermittent

☐ Perennial

Streamflow Duration Field Assessment Form

Notes: single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

- ☐ Prolonged Abnormal Rainfall / Snowpack
  - ☐ Below Average
  - ☐ Above Average
- ☐ Natural or Anthropogenic Disturbance
- ☐ Other: _____

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

Well vegetated section of stream. Vegetation is dominated cattail, total vegetation cover is >100%. Soil saturation at 3.5 inches bgs, and free-standing water at 9.5 inches bgs.

Ancillary Information:

- ☐ Riparian Corridor
- ☐ Erosion and Deposition
- ☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

Streamflow Duration Field Assessment Form

Project # / Name Carty ASC Amendment #1	Assessor Greg Mazer & Rachel Locke
Address Morrow County, Oregon - Carty Generating Station	Date 4/7/16
Waterway Name Upper part of stream	Coordinates at downstream end (ddd.mm.ss) Lat. N
Reach Boundaries Upper section / North of Wetland B	Long. W
Precipitation w/in 48 hours (cm) 0	Channel Width (m) 2
	☐ Disturbed Site / Difficult Situation (Describe in "Notes")

Observed Hydrology

% of reach w/observed surface flow 0

% of reach w/any flow (surface or hyporheic) 0

# of pools observed 0

Observations

Observed Wetland Plants (and indicator status):

none

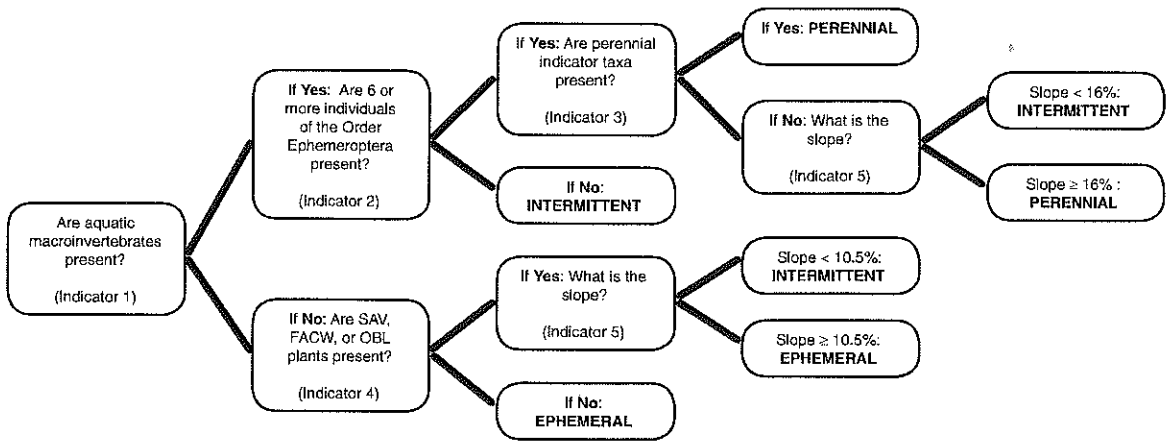
Observed Macroinvertebrates:

Taxon	Indicator Status	Ephemeroptera?	# of Individuals
none			

Indicators

1. Are aquatic macroinvertebrates present?	☐ Yes	☒ No
2. Are 6 or more individuals of the Order Ephemeroptera present?	☐ Yes	☒ No
3. Are perennial indicator taxa present? (refer to Table 1)	☐ Yes	☒ No
4. Are FACW, OBL, or SAV plants present? (Within ½ channel width)	☐ Yes	☒ No
5. What is the slope? (In percent, measured for the valley, not the stream)	0.5 %	

Conclusions



Single Indicators:

☐ Fish

☐ Amphibians

Finding:

☒ Ephemeral

☐ Intermittent

☐ Perennial

Streamflow Duration Field Assessment Form

Notes: single indicator conclusions, description of disturbances or modifications that may interfere with indicators, etc.)

Difficult Situation:

Describe situation. For disturbed streams, note extent, type, and history of disturbance.

- ☐ Prolonged Abnormal Rainfall / Snowpack
  - ☐ Below Average
  - ☐ Above Average
- ☐ Natural or Anthropogenic Disturbance
- ☐ Other: _____

Approximately normal precipitation preceding the investigation. 0.08 inches of rainfall in the 2 weeks

Additional Notes: (sketch of site, description of photos, comments on hydrological observations, etc.) Attach additional sheets as necessary.

Sparsely vegetated section of the channel. Dominated by cheatgrass (Bromus tectorum); total vegetation cover is < 70% and all species present are herbaceous.

Ancillary Information:

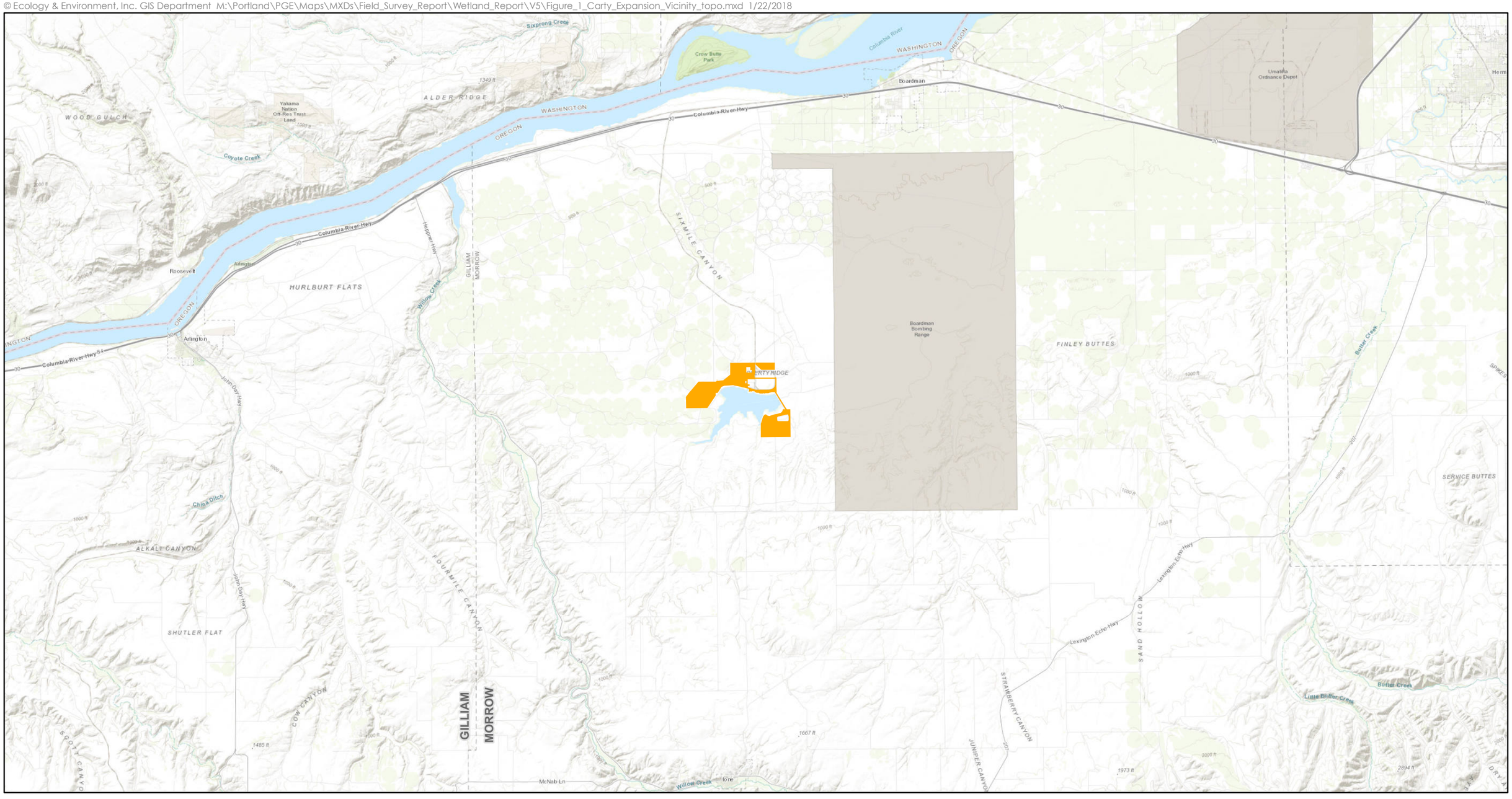
- ☐ Riparian Corridor
- ☐ Erosion and Deposition
- ☐ Floodplain Connectivity

Observed Amphibians, Snake, and Fish:

Taxa	Life History Stage	Location Observed	Number of Individuals Observed

ATTACHMENT C
Figures

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Amended Site Boundary

N

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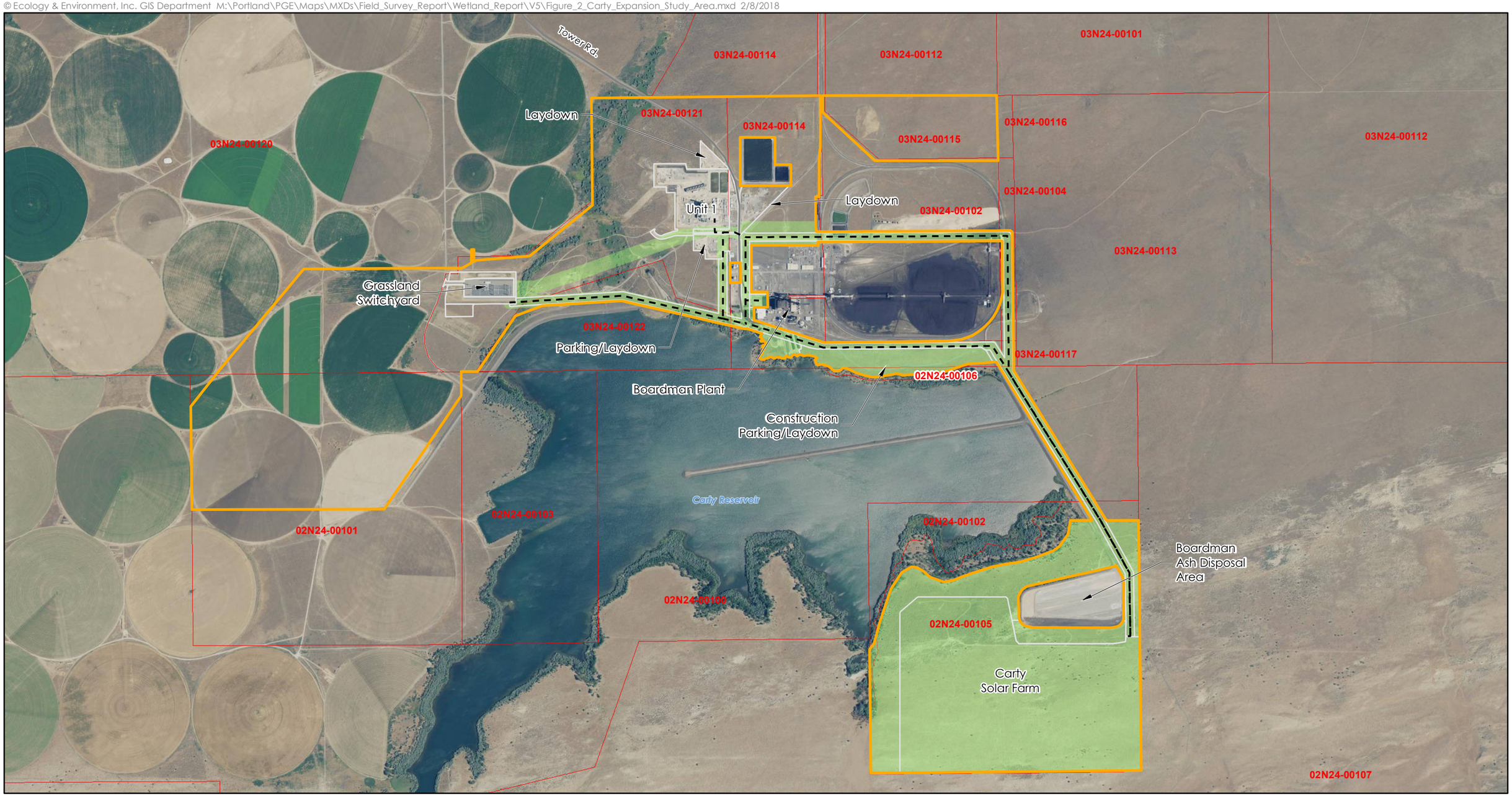
0 2.5 5 Miles

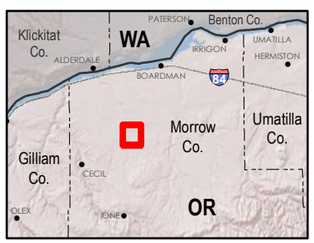
Credits: Sources: Esri, HERE, DeLorme, Intermap, increment

Figure 1
Vicinity Map

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- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas
- Study Area
- Morrow Coounty Taxlot

N

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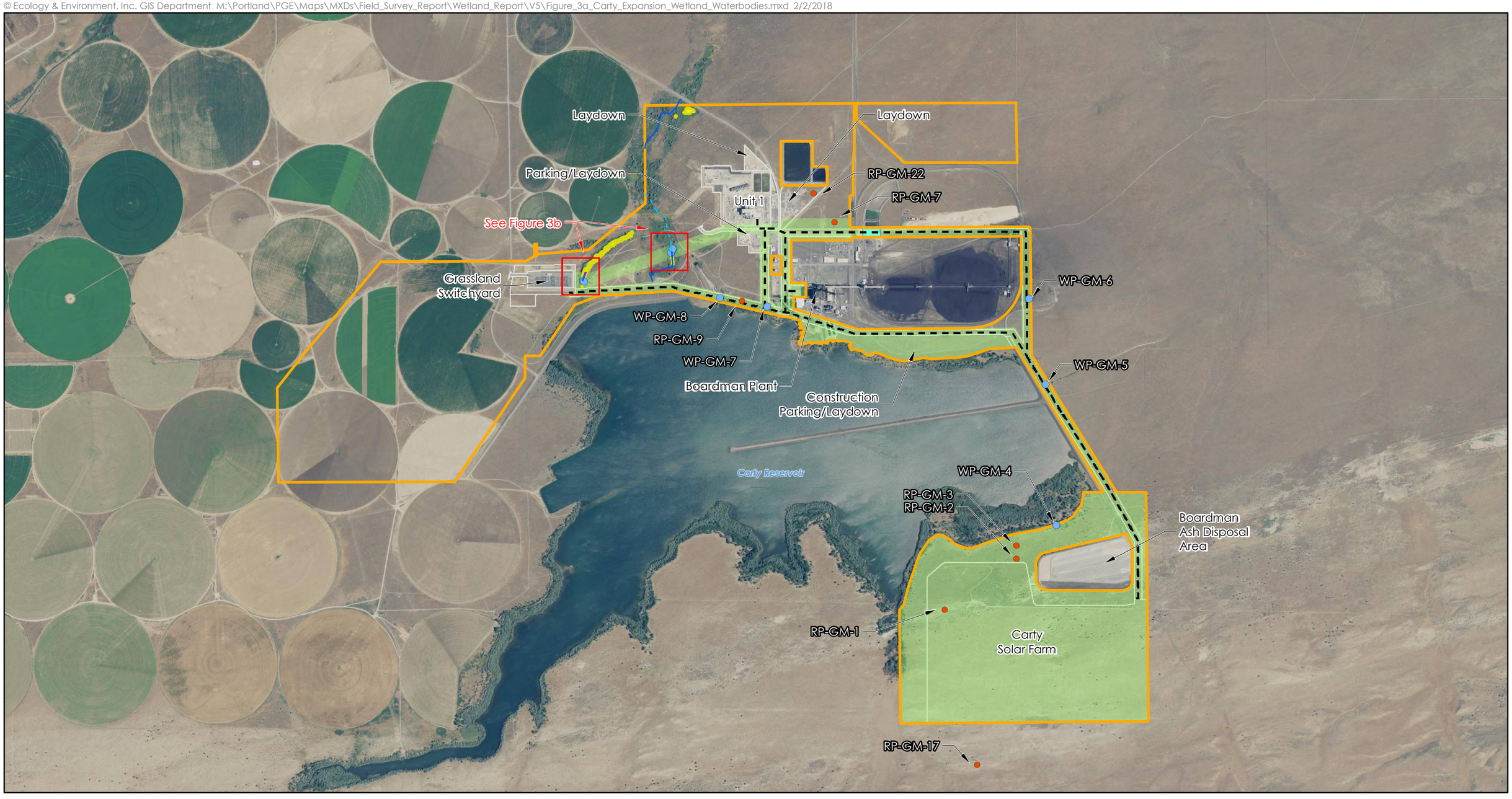
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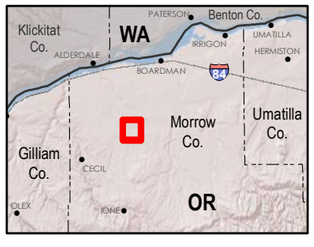
Credits: Copyright:© 2014 Esri
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Figure 2
Study Area and
Tax Lot Boundaries

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- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas
- Study Area
- Data Plot
- Reference Point
- Artificial Pond
- Wetland (2016 delineation)
- Wetland (2013 DSL Concurrence)

Stream
- Ephemeral
- Intermittent

N

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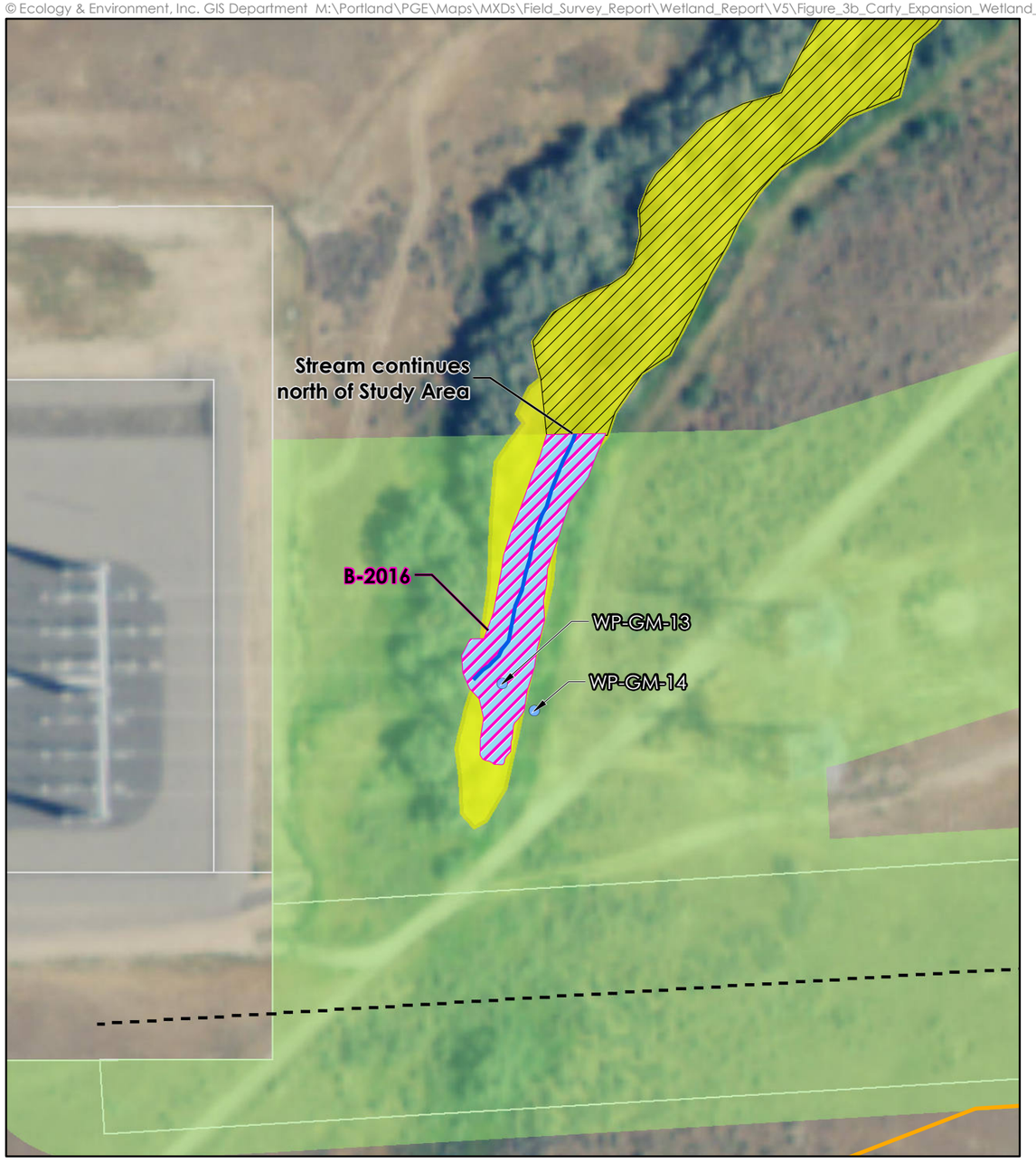
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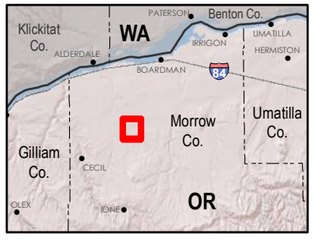
Figure 3a
Wetlands and Waterbodies with Map Tile Overview

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February 2018

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- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas
- Study Area
- Data Plot
- Reference Point
- Artificial Pond
- Wetland (2016 delineation)
- Wetland (2013 DSL Concurrence)

Stream
- Ephemeral
- Intermittent

N

1:1,200

0 75 150 Feet

Credits: Copyright:© 2014 Esri
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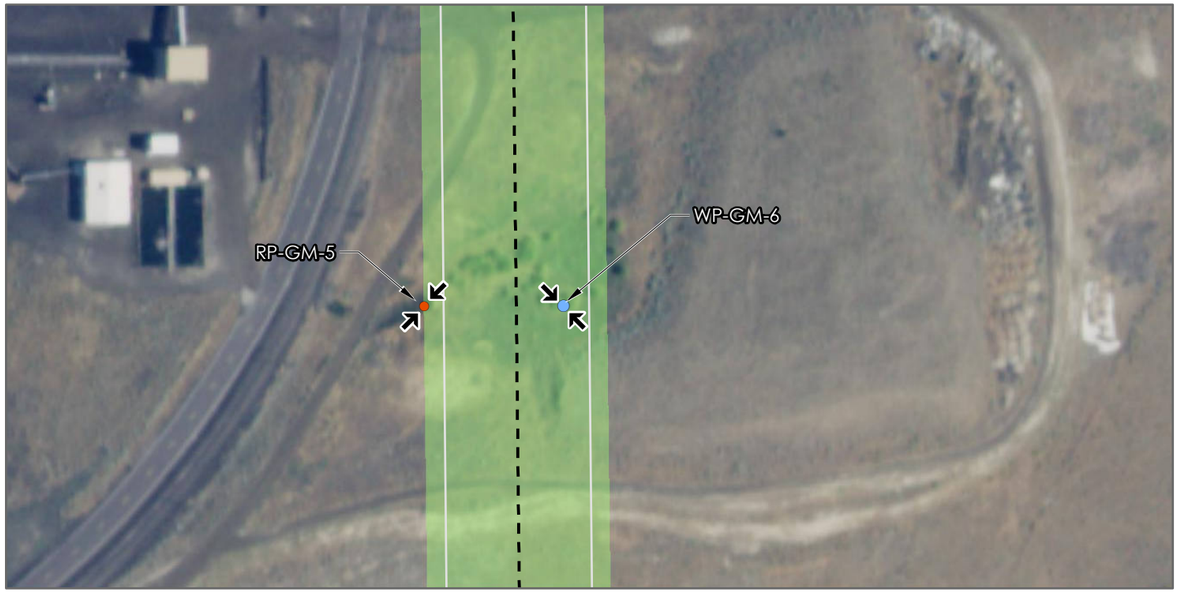
Figure 3b
Wetlands and
Waterbodies Detail

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

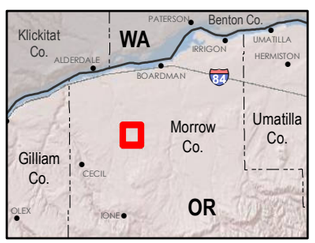
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- Transmission Line Options
- Existing or Proposed Project Disturbance Areas
- Study Area
- Data Plot
- Reference Point
- Photo Direction
- Wetland

N

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0 100 200 300 Feet

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Esri, USDA Farm Service Agency

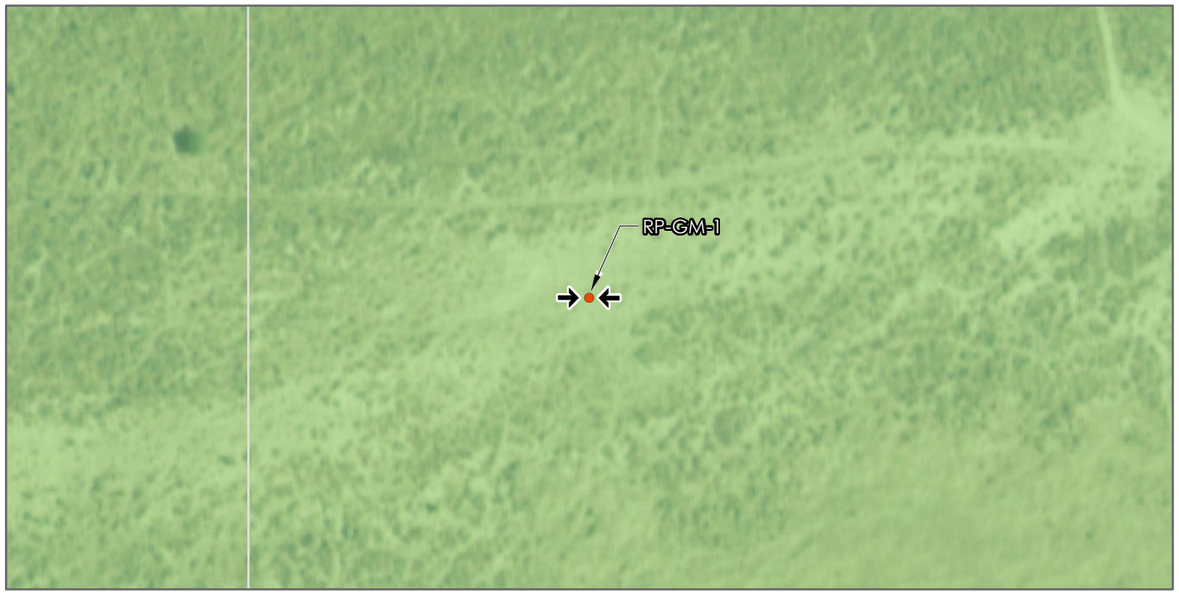
Figure 4
Sheet 1 of 3
Data Plot and Reference Photo Location and View Direction

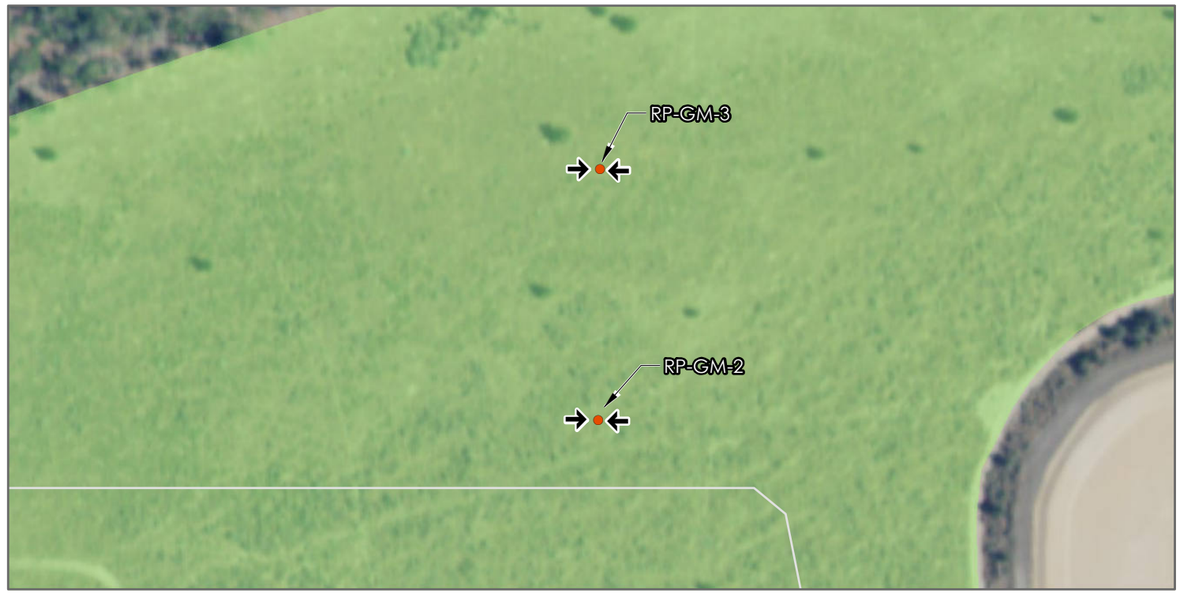
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Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

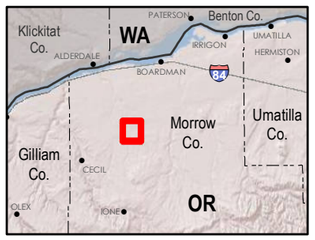
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- Transmission Line Options
- Existing or Proposed Project Disturbance Areas
- Study Area
- Data Plot
- Reference Point
- Photo Direction

Streams
- Ephemeral
- Intermittent

- Wetland

N

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0 100 200 300 Feet

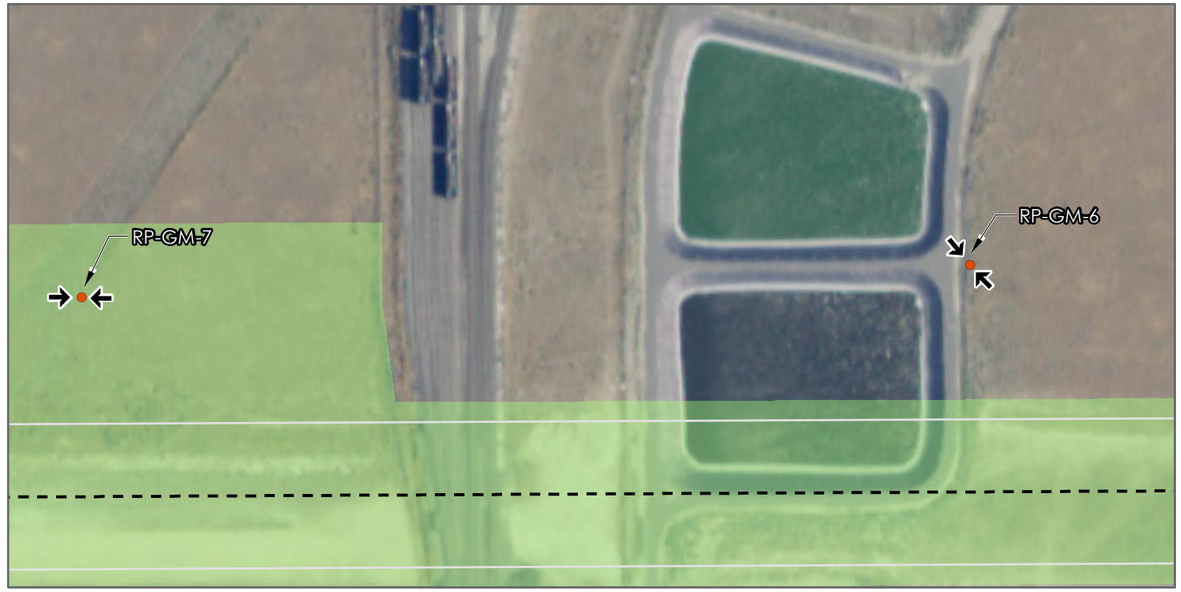
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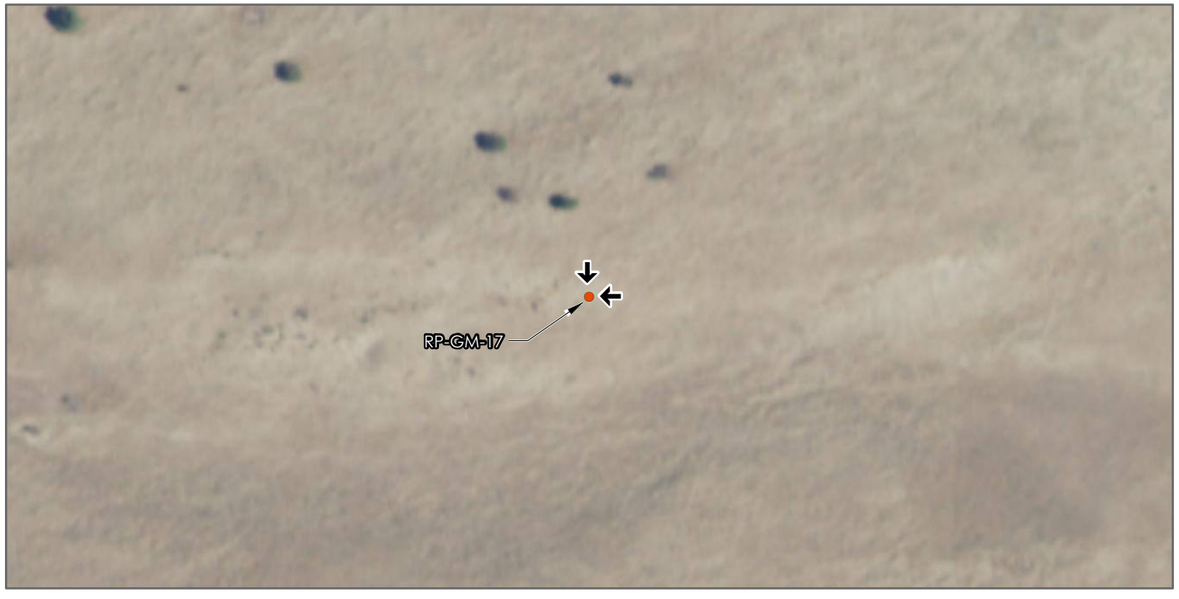
Figure 4
Sheet 2 of 3
Data Plot and Reference Photo Location and View Direction

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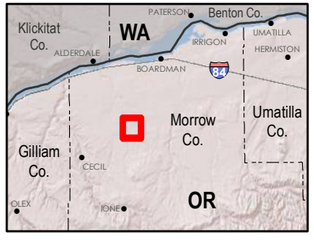
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- Transmission Line Options
- Existing or Proposed Project Disturbance Areas
- Study Area
- Data Plot
- Reference Point
- Photo Direction
- Wetland

N

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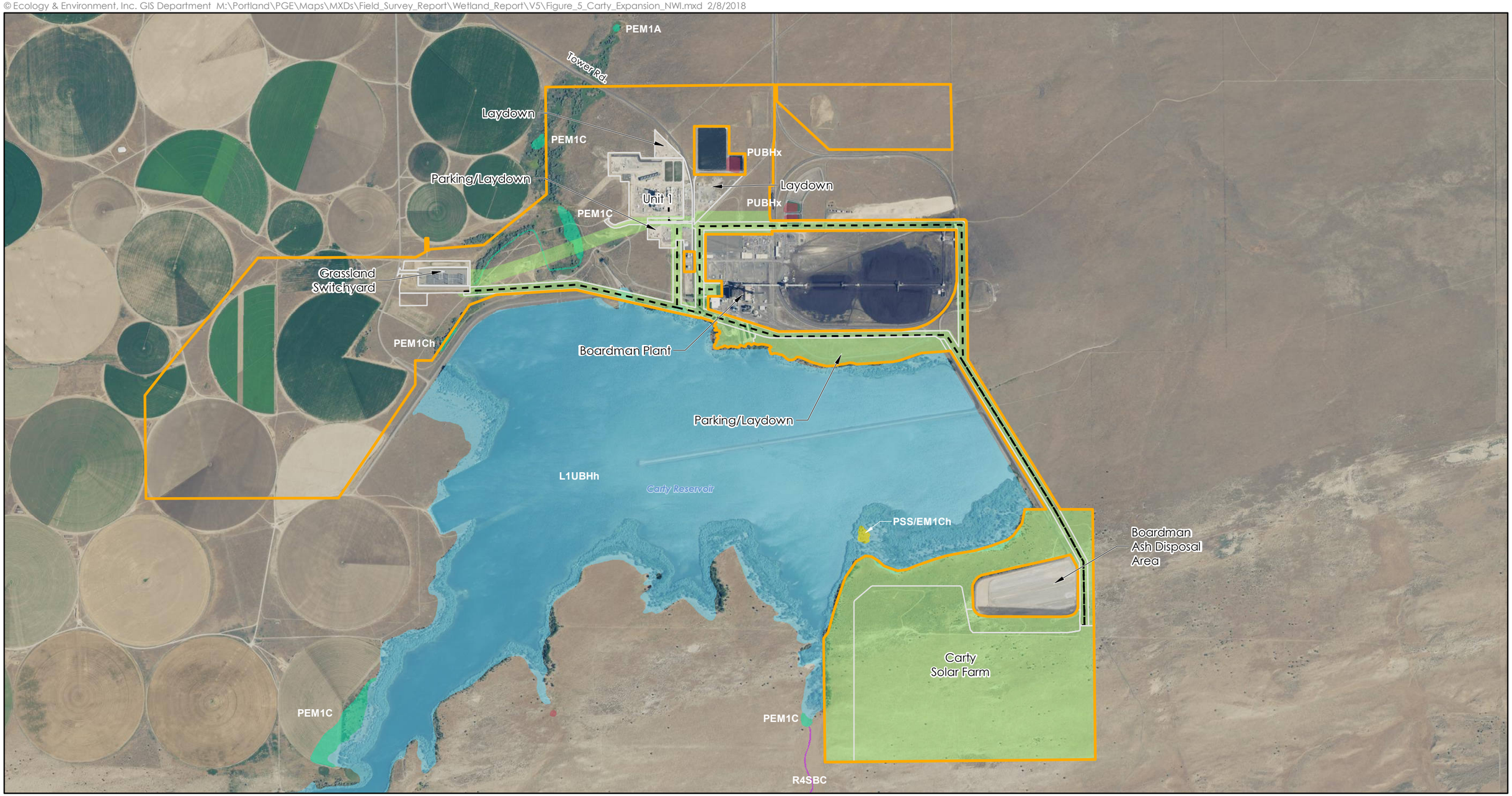
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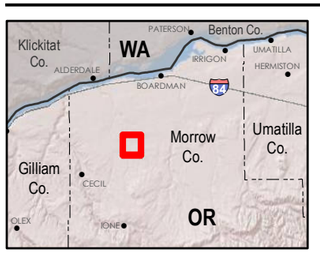
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Figure 4
Sheet 3 of 3
Data Plot and Reference Photo Location and View Direction

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- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas
- Study Area

Cowardin Class

- Lacustrine limnetic unconsolidated bottom, permanently inundated, diked/impounded (L1UBHh)
- Palustrine emergent wetland, persistent vegetation, seasonally inundated, (PEM1C)
- Palustrine scrub-shrub/emergent wetland, persistent vegetation, seasonally inundated, diked/impounded (PSS/EM1Ch)
- Palustrine unconsolidated bottom, permanently inundated, excavated (PUBHx)
- Riverine intermittent streambed, seasonally inundated (R4SBC)

NOTE: There are no National Hydrography Dataset features present in the Amended Site Boundary.

N

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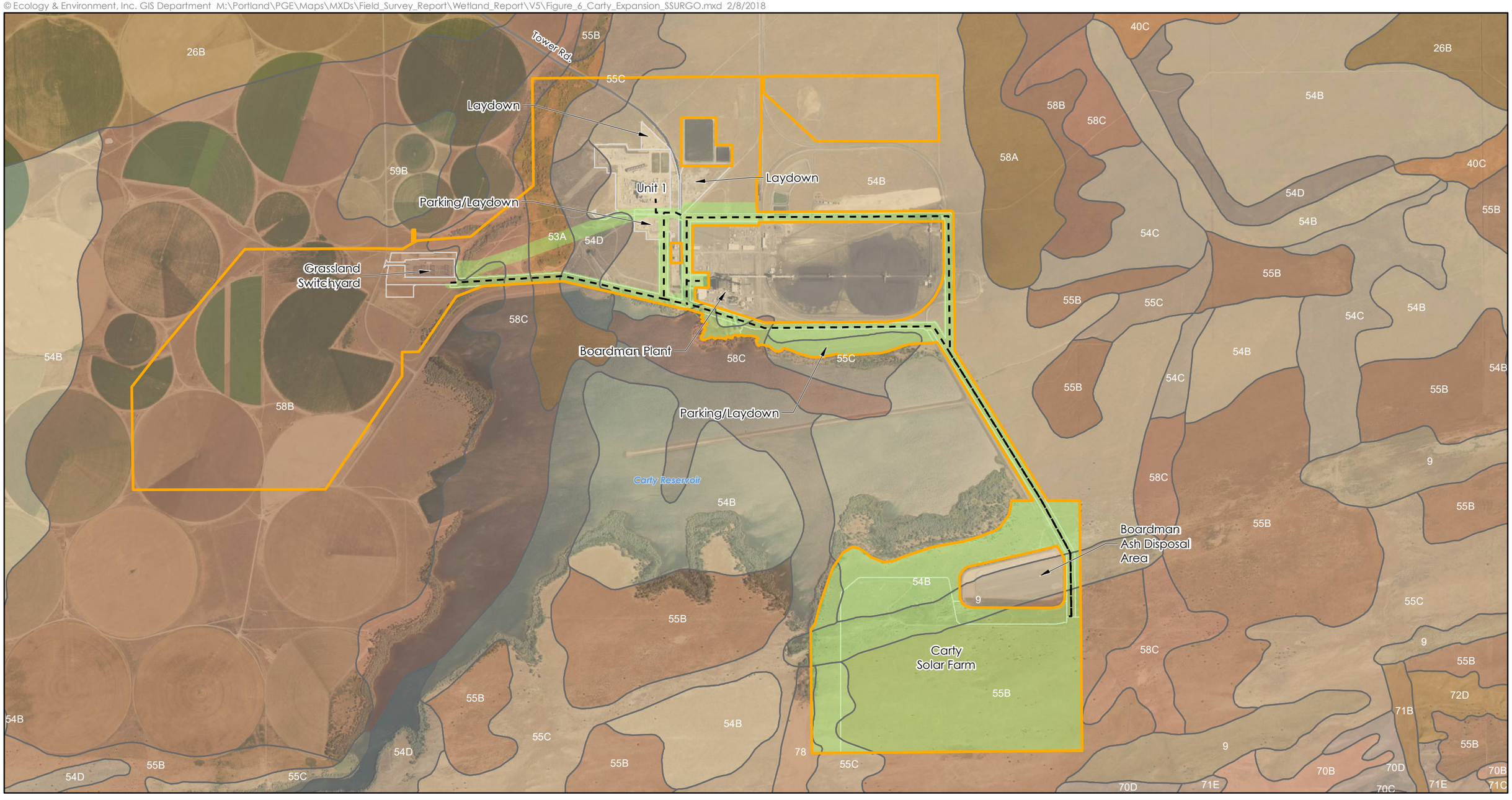
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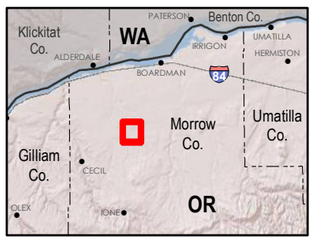
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Figure 5
National Wetland Inventory

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- Transmission Line Options
- Amended Site Boundary
- Existing or Proposed Project Disturbance Areas
- Study Area

Soil Map Units

- 9 - Dune land
- 53A - Royal silt loam, 0 to 3 percent slopes
- 54B - Sagehill fine sandy loam, 2 to 5 percent slopes
- 54D - Sagehill fine sandy loam, 12 to 20 percent slopes
- 55B - Sagehill fine sandy loam, hummocky, 2 to 5 percent slopes
- 55C - Sagehill fine sandy loam, hummocky, 5 to 12 percent slopes
- 58B - Taunton fine sandy loam, 2 to 5 percent slopes
- 58C - Taunton fine sandy loam, 5 to 12 percent slopes
- 78 - Xeric Torriorthents, nearly level

N

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0 0.25 0.5 Miles

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Figure 6
Soil Survey

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February 2018

ATTACHMENT D
Photographic Log

Attachment D – Photographic Log

ID: WP-GM-4	**Date:** April 6, 2016	**Direction:** NW
Description: Upland. Sagebrush Steppe with Riparian Forest in background. View from center of plot.		



ID: WP-GM-4	**Date:** April 6, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-5	**Date:** April 6, 2017	**Direction:** WSW
Description: Upland. Terminus of ephemerally flowing ditch leading west through Broom Snakeweed Shrubland. View from center of plot.		



ID: WP-GM-5	**Date:** April 6, 2017	**Direction:** ENE
Description: Upland. Up-gradient view of ephemerally flowing ditch leading west through Broom Snakeweed Shrubland. View from center of plot.		



ID: WP-GM-5	**Date:** April 6, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-6	**Date:** April 6, 2017	**Direction:** NW
Description: Upland. Grassland (degraded). View from center of plot.		



ID: WP-GM-6	**Date:** April 6, 2017	**Direction:** SE
Description: Upland. Grassland (degraded) with Sagebrush Steppe in background. View from center of plot.		



ID: WP-GM-6	**Date:** April 6, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-7	**Date:** April 6, 2017	**Direction:** E

Description: Upland. Riparian Forest with the Boardman Plant in the background. View from center of plot.



ID: WP-GM-7	**Date:** April 6, 2017	**Direction:** W

Description: Upland. Riparian Forest with Grassland (degraded) and Sagebrush Steppe in background. View from center of plot.



ID: WP-GM-7	**Date:** April 6, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-8	**Date:** April 6, 2016	**Direction:** E
Description: Upland. Grassland (degraded). View from center of plot.		



ID: WP-GM-8	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Grassland (degraded). View from center of plot.		



ID: WP-GM-8	**Date:** April 6, 2017	**Direction:** down
Description: Soil profile.		



ID: WP-GM-9	**Date:** April 7, 2016	**Direction:** NE
Description: Wetland H2-2016. View from center of plot.		



ID: WP-GM-9	**Date:** April 7, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-11	**Date:** April 7, 2016	**Direction:** N
Description: Wetland H1-2016. View from center of plot.		



ID: WP-GM-11	**Date:** April 7, 2016	**Direction:** down
Description: Soil profile.		



ID: WP-GM-13	**Date:** April 7, 2016	**Direction:** NW
Description: Wetland B-2016. View from center of plot.		



ID: WP-GM-14	**Date:** April 7, 2016	**Direction:** N
Description: Upland adjacent to Wetland B-2016. View from center of plot.		



ID: WP-GM-14	**Date:** April 7, 2016	**Direction:** down
Description: Soil profile.		



ID: RP-GM-1	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Sagebrush Steppe, Sand dune.		



ID: RP-GM-1	**Date:** April 6, 2016	**Direction:** E
Description: Upland. Sagebrush Steppe, Sand dune.		



ID: RP-GM-2	**Date:** April 6, 2016	**Direction:** E
Description: Upland. Sagebrush Steppe, Loess with Russian thistle.		



ID: RP-GM-2	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Sagebrush Steppe, Loess with Russian thistle.		



ID: RP-GM-3	**Date:** April 6, 2016	**Direction:** E
Description: Upland. Broom Snakeweed Shrubland, with Russian thistle.		



ID: RP-GM-3	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Broom Snakeweed Shrubland, with Russian thistle.		



ID: RP-GM-4	**Date:** April 6, 2016	**Direction:** S
Description: Ditch near road leading through Broom Snakeweed Shrubland. View down-gradient. Ditch apparently excavated entirely in upland.		



ID: RP-GM-4	**Date:** April 6, 2016	**Direction:** S
Description: Ditch near road leading through Broom Snakeweed Shrubland. View up-gradient. Ditch apparently excavated entirely in upland.		



ID: RP-GM-5	**Date:** April 6, 2016	**Direction:** SW
Description: Upland. Grassland (degraded) with railroad in background.		



ID: RP-GM-5	**Date:** April 6, 2016	**Direction:** NE
Description: Upland. Grassland (degraded).		



ID: RP-GM-6	**Date:** April 6, 2016	**Direction:** NW
Description: Artificial Pond (Sewage Lagoon).		



ID: RP-GM-6	**Date:** April 6, 2016	**Direction:** SW
Description: Artificial Pond (Sewage Lagoon).		



ID: RP-GM-7	**Date:** April 6, 2016	**Direction:** E
Description: Upland. Sagebrush Steppe.		



ID: RP-GM-7	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Sagebrush Steppe with Boardman Plant in background.		



ID: RP-GM-9	**Date:** April 6, 2016	**Direction:** S
Description: Upland. Grassland (degraded) with Riparian Forest and Carty Reservoir in background.		



ID: RP-GM-17	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Grassland, Post-Burn.		



ID: RP-GM-17	**Date:** April 6, 2016	**Direction:** S
Description: Upland. Grassland, Post-Burn.		



ID: RP-GM-22	**Date:** April 6, 2016	**Direction:** W
Description: Upland. Sagebrush Steppe.		



ID: RP-GM-22	**Date:** April 6, 2016	**Direction:** S
Description: Upland. Sagebrush Steppe.		



Appendix J-2
Oregon Department of State Lands
2013 Concurrence

Oregon
John A. Kitzhaber, MD, Governor

Department of State Lands
775 Summer Street NE, Suite 100
Salem, OR 97301-1279
(503) 986-5200
FAX (503) 378-4844
www.oregonstatelands.us

State Land Board

John A. Kitzhaber, MD
Governor

Kate Brown
Secretary of State

Ted Wheeler
State Treasurer

December 24, 2013

Portland General Electric Company
Attn: Mike Livingston & Lenna Cope
121 SW Salmon Street, 3WTC-BR05
Portland, Oregon 97204

Re: Wetland Delineation Report for Morrow and Gilliam Counties; T02N R22E, R23E, & R24E; T03N R21E, 22E, 23E & 24E; portions of multiple Tax Lots – see attached Table F, revised; WD #2010-0023

Dear Mr. Livingston & Ms. Cope:

The Department of State Lands has reviewed the wetland delineation report prepared by Ecology and Environment, Inc. for the study area referenced above. Please see the attached maps and revised Table F for the study area locations. Based upon the information presented in the report, and additional information submitted upon request, we concur with the wetland and waterway boundaries as mapped in revised Figures 5.1 – 5.5 & corresponding detail maps (11 total in set), attached. Please replace all copies of the preliminary wetland maps with these final Department-approved maps. Within the study area, 15 wetlands (totaling approximately 7.279 acres) and four waterways were identified. The wetlands, Willow Creek, stream SS-002-001 and a portion of Sixmile Canyon Drainage are subject to the permit requirements of the state Removal-Fill Law. Under current regulations, a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in the wetland or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined).

However, within the study area Eightmile Canyon Drainage and a portion of Sixmile Drainage were determined to have ephemeral flow and therefore, are not state jurisdictional. Please see the revised Table F and maps for details.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. The Army Corps of Engineers will review the report and make a determination of jurisdiction for purposes of the Clean Water Act at the time that a permit application is submitted. We recommend that you attach a copy of this concurrence letter to both copies of any subsequent joint permit application to speed application review.

Please be advised that state law establishes a preference for avoidance of wetland impacts. Because measures to avoid and minimize wetland impacts may include reconfiguring parcel layout and size or development design, we recommend that you

work with Department staff on appropriate site design before completing the city or county land use approval process.

This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter, unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity, or complete permit application. The applicant, landowner, or agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

Thank you for having the site evaluated. Please phone me at 503-986-5297 if you have any questions.

Sincerely,

Jevra Brown
Wetland Specialist

Approved by

Kathy Verble, CPSS
Acting Wetlands Program Manager

Enclosures

ec: Clare Kenny, Ecology and Environment, Inc.
Morrow County Planning Department
Gilliam County Planning Department
Shelly Lynch, Corps of Engineers LaGrande office
Heidi Hartman, DSL Bend office
Sue Oliver & Duane Kilsdonk, OR Department of Energy, EFSC

DUANE KILSDONK ODOE COMPLIANCE OFFICER Duane.Kilsdonk@state.or.us
SUE OLIVER " " " Sue.Oliver@state.or.us

WETLAND DELINEATION / DETERMINATION REPORT COVER FORM

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach the form to the front of an unbound report and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279**
Mail a copy of the completed form with payment of the required report review fee to: **Oregon Department of State Lands, P.O. Box 4395, Unit 18, Portland, OR 97208-4395.**
For new credit card payment option, see DSL web site.

☒ Applicant ☐ Owner Name, Firm and Address: **Portland General Electric Company** **121 SW Salmon Street, 3WTC-BR05** **Portland, OR 97204**	Business phone # **503/464-8519** Mobile phone # (optional) FAX # **503-464-8527** E-mail: **ray.hendricks@pgn.com**
☒ Authorized Legal Agent, Name and Address: **Mike Livingston** **121 SW Salmon St** **Portland, OR 97204** Lenda.Cope@pgn.com Environmental Engineer	Business phone # **503-464-8127** FAX # **503-464-2863** Mobile phone # **503-849-3299** E-mail: **mike.livingston@pgn.com**

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.
Typed/Printed Name: **Mike Livingston** Signature: _____
Date: **2/15/2010** Special instructions regarding site access:

Project and Site Information (for latitude & longitude, use centroid of site or start & end points of linear project)

Project Name: **Carty Generating Station**	Latitude: **45 41'59.937"N** Longitude: **119 48' 49.39" W**
Proposed Use: **Combined-cycle natural gas power generating facility and associated 18-mile transmission line**	Tax Map # **Attached table lists all tax map numbers for the project.** Table F revised
Project Street Address (or other descriptive location): **Near the existing Boardman Plant - accessed from I-84 and Tower Road**	Township Range Section QQ Tax Lot (s) **Attached table lists tax lots.**
City: **near Boardman** County: **Morrow/Gilliam**	Waterway: River Mile: NWI Quad(s): **Arlington, Horn Butte, Dalreed Butte, Ella**

Wetland Delineation Information

Wetland Consultant Name, Firm and Address: **Lucas C. Meek** CLARE KENNY x4624 **Ecology and Environment, Inc.** **333 SW Fifth Ave, Suite 600, Portland, OR 97204**	Phone # **503/248-5600** x 4608 reception 7130-4 Mobile phone # FAX # **503/248-5577** E-mail: **lmeek@ene.com** Cell ph # 360-907-0549

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.
Consultant Signature: _____ Date: 2/15/10

Primary Contact for report review and site access is ☒ Consultant ☐ Applicant/Owner ☐ Authorized Agent 7.279

Wetland/Waters Present? ☒ Yes ☐ No | Study Area size: **2,400 acres** | Total Wetland Acreage: ~~4~~ acres (see Table F revised

Check Box Below if Applicable: **Fees:**

☐ R-F permit application submitted	☒ Fee payment submitted $ **363.00**
☐ Mitigation bank site	☐ Fee ($100) for resubmittal of rejected report
☐ Wetland restoration/enhancement project (not mitigation)	Name of Payor: **Eric White, E&E**
☐ Industrial Land Certification Program Site	

Other Information:	Y	N	
Has previous delineation/application been made on parcel?	☐	☒	If known, previous DSL # **Unknown**
Does LWI, if any, show wetland or waters on parcel?	☐	☐	No LWI available

For Office Use Only

DSL Reviewer: JB	Fee Paid Date: ___/___/___	DSL WD # 200-0023
Date Delineation Received: 2/16/10	DSL Project # _____	DSL Site # _____
Scanned: ☒ Final Scan: ☐	DSL WN # _____	DSL App. # _____

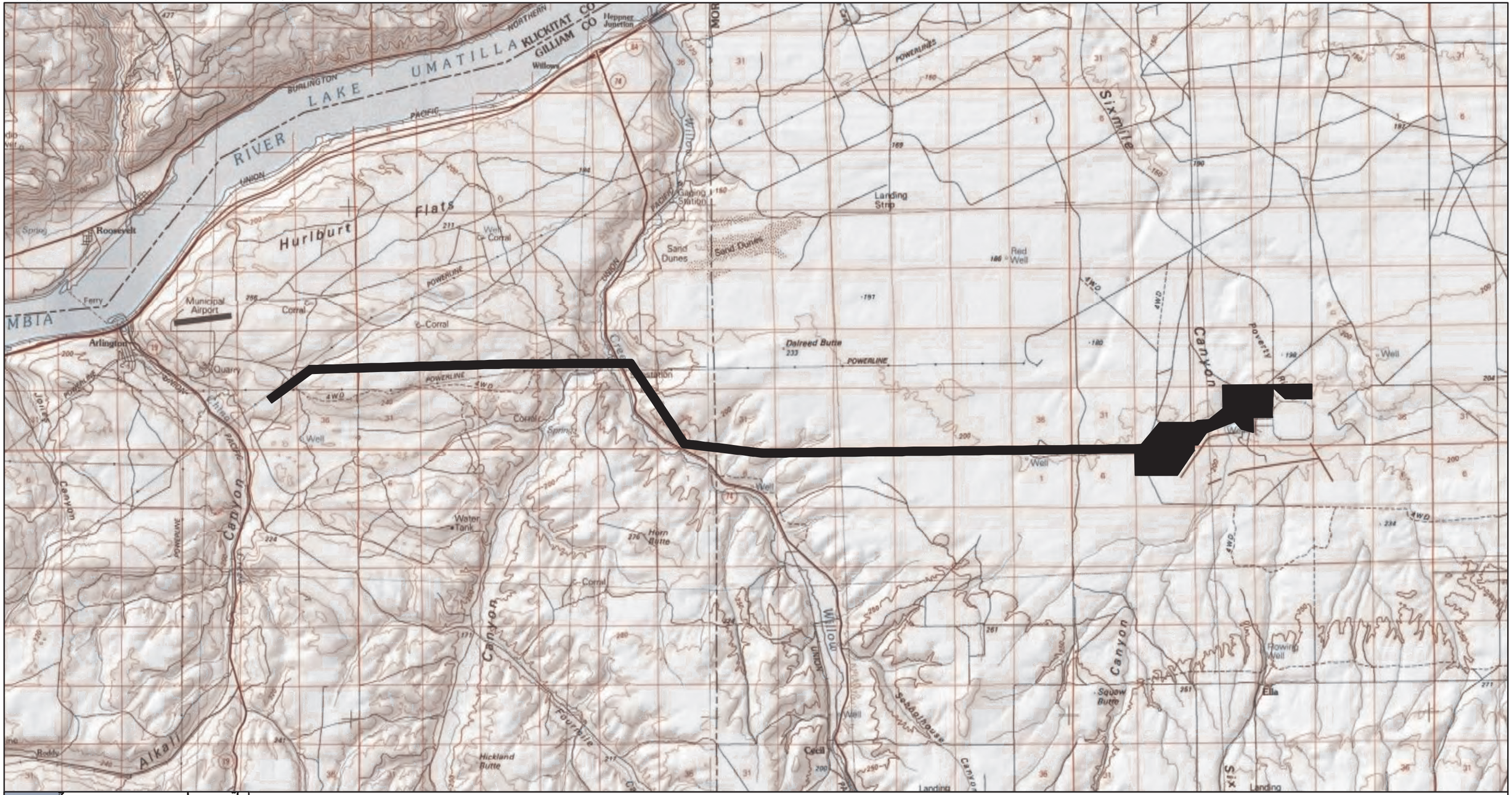
Cover rec'd 2.15.10

Form Effective January 1, 2008

Table F: Tax Lot and Figure Number Guide for Delineated Features - revised

COUNTY	MAP NUMBER	TAX LOT	2013 ADDENDUM FIGURES	FINAL FIGURES	FEATURE ID	TOTAL ACRES	FINAL DSL DETERMI-NATION
MORROW	03N24E	102	--	--	(None)	--	
	03N24E	115	--	--	(None)	--	
	03N24E	114	--	--	(None)	--	
	02N24E	101	--	--	(None)	--	
	03N24E	101	--	--	(None)	--	
MORROW	02N24E	103	--	--	(None)	--	
MORROW	02N23E	100	S6, 11	5.3, 5.3.1	Wetland C	0.9	Yes
			S7, S12	5.3, 5.3.2	Wetland D	0.2	Yes
			S7, S10	5.3, 5.3.1	WW-002-009	0.1	Yes
			S7, S10	5.3, 5.3.1	WW-002-010	0.6	Yes
			S7, S10	5.3, 5.3.1	WW-002-011	0.3	Yes
			S7, S11	5.3, 5.3.1	WW-002-012	0.7	Yes
			S6	5.3, 5.3.1	SS-002-001	n/a	Yes
MORROW	03N24E	120	S1, S2, S10	5.1, 5.1.1	Wetland A	0.8	Yes
			S5, S11	5.1, 5.1.3	Wetland B	2.2	Yes
			S1, S2	5.1, 5.1.1	Wetland J	0.01	Yes
			S4, S12	5.1, 5.1.2	Wetland H-1	0.85	Yes
			S4, S12	5.1, 5.1.2	Wetland H-2	0.01	Yes
			S4, S12	5.1, 5.1.2	WW-002-001	0.005	Yes
			S1, S2, S11	5.1, 5.1.1	WW-002-002	0.3	Yes
			S1, S2, S10	5.1, 5.1.1	WW-002-007	0.3	Yes
			S4, S11	5.1, 5.1.2	WW-004-001	0.004	Yes
			S1, S2, S3, S4	5.1, 5.1.1, 5.1.2	Sixmile Canyon Drainage	n/a	Yes, Figure 5.1.1 No, Fig. 5.1.2, ephemeral
GILLIAM	03N22E	2100	--	--	(None)	--	
GILLIAM	03N21E	506	--	--	(None)	--	
GILLIAM	03N22E	700	S8	5.4, 5.4.1	Willow Creek	n/a	Yes
			S8	5.4, 5.4.1	Eightmile Canyon Drainage	n/a	No, ephemeral
GILLIAM	03N22E	701	--	--	(None)	--	
GILLIAM	03N22E	2800	--	--	(None)	--	
GILLIAM	03N21E	503	--	--	(None)	--	
GILLIAM	02N22E	100	S7, S12	5.3, 5.3.2	Wetland D	see above	Yes
GILLIAM	03N23E	100	S7, S12	5.3, 5.3.2	Wetland D	see above	Yes
GILLIAM	02N22E	200	--	--	(None)	--	
	03N22E	2202	--	--	(None)	--	
	03N22E	2201	--	--	(None)	--	
	03N22E	3601	--	--	(None)	--	
	02N22E	300	--	--	(None)	--	
	03N22E	2203	--	--	(None)	--	

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Site Boundary

N

0 0.5 1 2 3 4 5 Miles

0 0.5 1 2 3 4 5 Kilometers

DSL WD2010-0023

Figure 1
Project Location
PGE Carty Generating Station
Application for Site Certificate

Revision 1 Wetland Delineation Report July 2010

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03n24-00120

Tower Rd.

Sixmile Canyon

03n24-00114

03n24-00101

Wetlands
A and J

Sixmile Canyon Drainage

03n24-00115

03n24-00116

Wetlands
H and H2

Wetland B

03n23-00100

03n24-00102

Carty Reservoir

02n24-00103

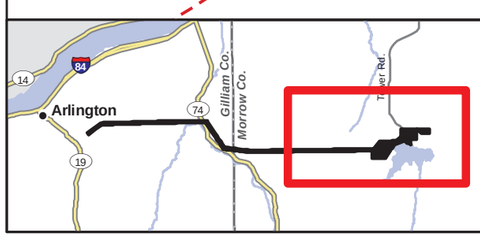
02n24-00101

02n23-00100

02n23-00100

02n24-00100

Sixmile Canyon



N

0 0.25 0.5 1 1.5 2 Miles

0 0.25 0.5 1 1.5 2 Kilometers

Site Boundary

Access Road Corridor

Field Delineated Wetland Location

Stream Feature

Intersecting Tax Lot Boundary

Map Tax Lot # Labeled

Figure 2a
Tax Lots
PGE Carty Generating Station
Application for Site Certificate

Revision 1 Wetland Delineation Report July 2010

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3N22E000700

3N22E0002100

03n23-00100

3N22E0002800

3N21E000506

3N22E0003601

3N22E0002202

3N22E0002201

3N22E0002203

Eight Mile Canyon Creek

Willow Creek

3N22E000701

3N21E000503

Wetland D

Wetland C

2N22E000300

2N22E000200

2N22E000100

02n23-00100

19

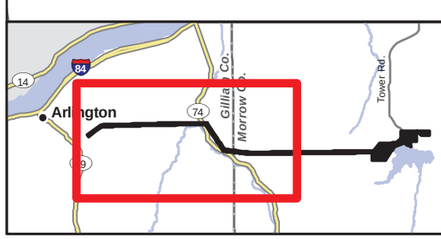
74

Eightmile Canyon

Gilliam County

Morrow County

Willow Creek



N

0 0.25 0.5 1 1.5 2 Miles

0 0.25 0.5 1 1.5 2 Kilometers

Site Boundary

Access Road Corridor

Field Delineated Wetland Location

Stream Feature

Intersecting Tax Lot Boundary

Map Tax Lot # Labeled

Figure 2b
Tax Lots
PGE Carty Generating Station
Application for Site Certificate

Revision 1 Wetland Delineation Report July 2010

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Sixmile Canyon Drainage

Wetland A Area

FIGURE 5.1.1

FIGURE 5.1.2

FIGURE 5.1.3

Wetland B

Wetland H2

Wetland H

03n24-00112

03n24-00101

03n24-00115

03n24-00116

03n24-00120

03n24-00113

03n24-00104

03n24-00102

03n24-00114

03n24-00117

02n24-00106

02n24-00100

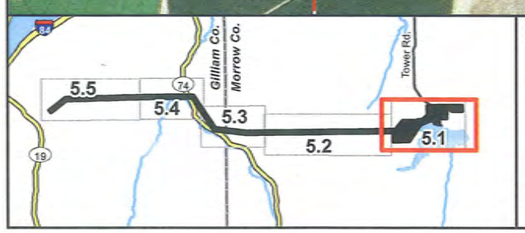
02n24-00107

02n24-00103

02n24-00101

02n24-00102

02n24-00105



Site Boundary

Proposed Energy Facility Area

Temporary Construction Area

Proposed Grassland Switchyard

Tax Lots

Access Road

Field Delineated Wetland

Stream Features

N

0 0.25 0.5 1 Miles

0 0.25 0.5 1 Kilometers

DSL WD # 2010-0023 10f11

Approval Issued 12/24/2013

Approval Expires 12/24/2018

Figure 5.1
Wetland and Watebodies Map Tile Overview, including Tax Lot Boundaries
PGE Carty Generating Station
December 2013

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Sixmile Canyon Drainage (Drainage extends beyond study area to the NE and SW)

W03
0277 - W
0278 - S

U01
0337 - SE
0339 - NE

W01
1203 - S
1204 - E
1206 - SW
1207 - N

03n24-00114

U03
0247 - E
0276 - S

Sixmile Canyon Drainage maximum width at OHWM is 15 feet

W02
0364 - S
0365 - SE

Wetland A

W A-1
A-3 - S

A-4 - NW

W A-2

U A-1
A-2 - NW

U A-2

A-1 - NE

Wetland J

U J-1
J-1 - W

U03
0362 - N
0363 - S

RP-002-050
0340 - N

W J-1
J-2 - E

03n24-00120

U04
0356 - SW
0357 - W

XW-002-008
0348 - E
0349 - S
0350 - SW
0351 - N

W02
None

W02
0318 - N

W01

W04
1208 - W
1210 - N

U02
0279 - N
0280 - NW

W03
0325 - N
0328 - E

WW-002-007

U01
0317 - N

WW-002-002

XW-001-005
0305 - SW

U03
0327 - E
0328 - E

U01
0285 - SW
0286 - S

XW-002-003
0293 - NW
0294 - W

RP-002-019
0312 - NW
0313 - NW/N
0314 - N
0315 - NE

Sixmile Canyon Drainage (Drainage extends beyond study area to the NE and SW)

W01
0281 - S
0282 - SE
0284 - W

XW-002-002
0287 - S
0288 - S
0289 - E
0290 - W

Geographic Reference Location
(45.702529, -119.815928)

XW-002-001
0267 - SE
0268 - E
0269 - NE



N

0 125 250 500 Feet

1 inch = 200 feet

Site Boundary
Access Road
Tax Lots

2012 / 2013 E&E Field Data
Wetlands
Photo Location
Point marks transition to intermittent flow (to NE) THIS REACH

Soil Points
Upland
Wetland
Delineated Water Features

OHWM = 15' MAX WIDTH SIXMILE CANYON

2009 E&E Field Data
Soil Sample
Upland
Wetland

Field Data Accurate to +/- 1 meter

DSL WD # 2010-0023 20f11

Approval Issued 12/24/2013

Approval Expires 12/24/2018

Figure 5.1.1: Wetland A Area

PGE Carty Generating Station

December 2013

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RP-004-019
0198 - N
0199 - E
0200 - S
0201 - W

WW-002-001

Feature extends beyond study area

006
0196 - NW
0197 - SE

005
0194 - N
0195 - S

Sixmile Canyon Drainage

WW-004-001

004
0182 - NW
0183 - S

003
0180 - N
0181 - S

Geographic Reference Location
(45.697765, -119.819067)

0367 - W
0368 - W
0369 - SW

002
0178 - N
0179 - S

001
0177 - S

Wetland H-2

H-2

H-2

H1-1 - S
H1-2
H1-3

H2-1 - NE
H2-2 - N

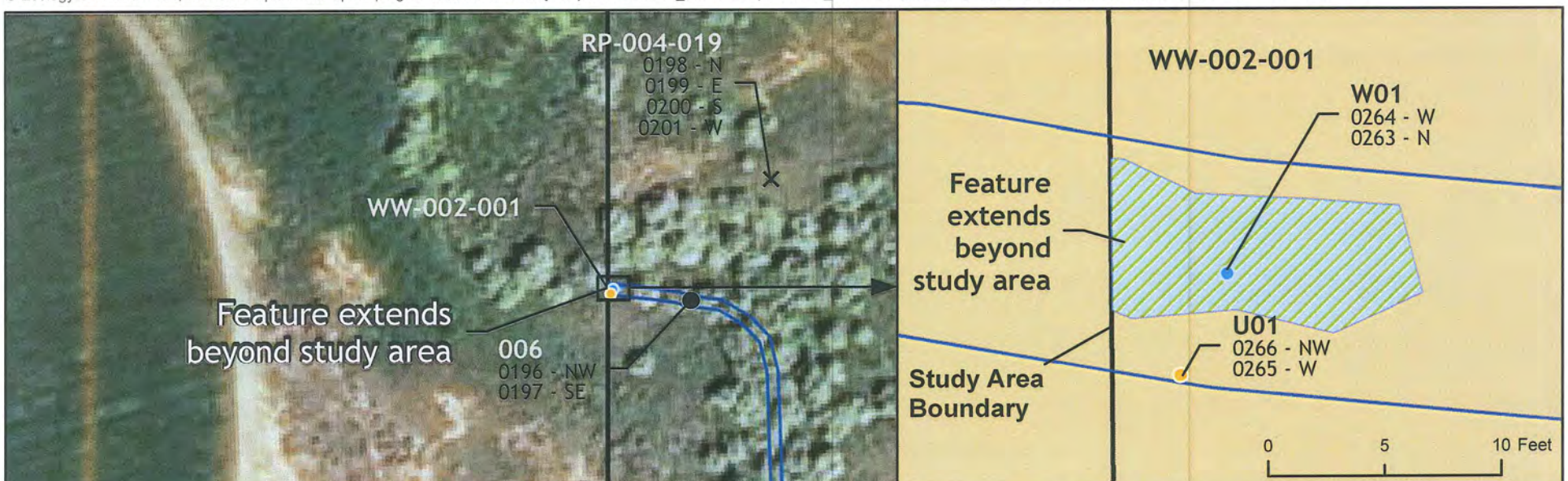
Wetland H

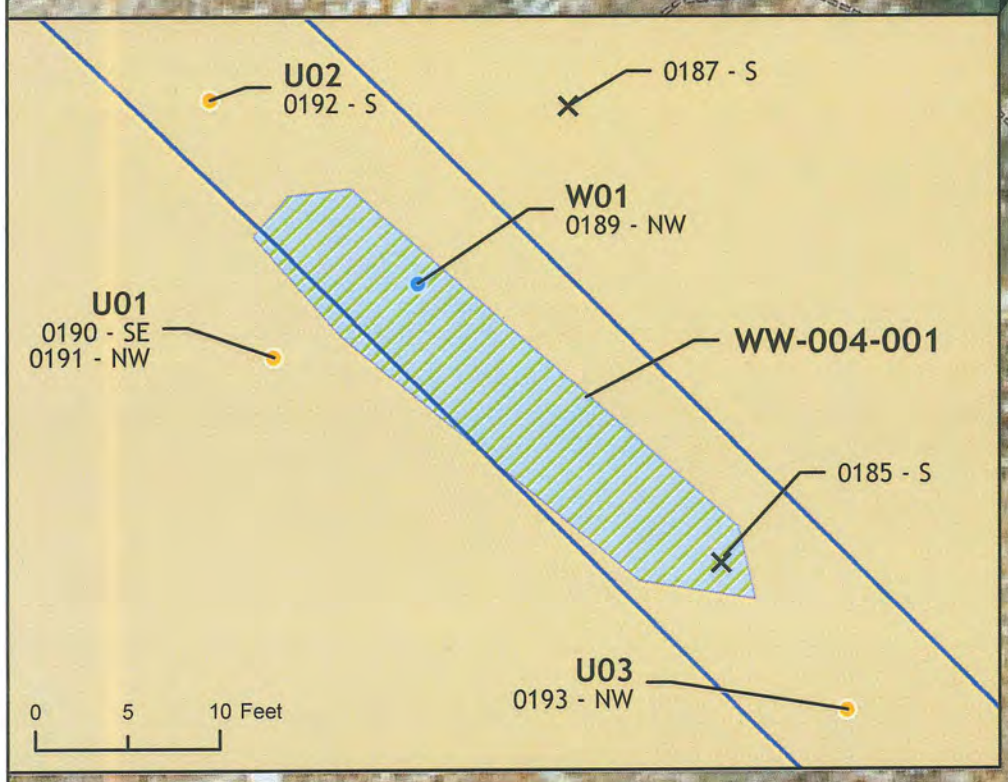
H-1

H-1

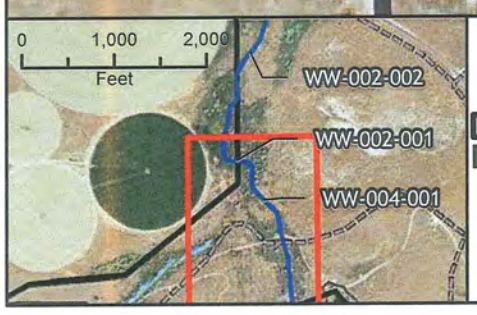
007
None

(Sixmile Canyon Drainage extends beyond study area to the south)





DSL WD # 2010-0023 3of11
Approval Issued 12/24/2013
Approval Expires 12/24/2018



N
0
125
250
500 Feet
1 inch = 200 feet

Site Boundary
Access Road
Culvert / Bridge Road Crossing
2012 / 2013 E&E Field Data
Wetlands
Six-mile Canyon Drainage (OHWM width is 10 feet)
EPHEMERAL THIS REACH
Photo Location
SDAM Points
Soil Points
Upland
Wetland
2009 E&E Field Data
Soil Sample
Upland
Wetland

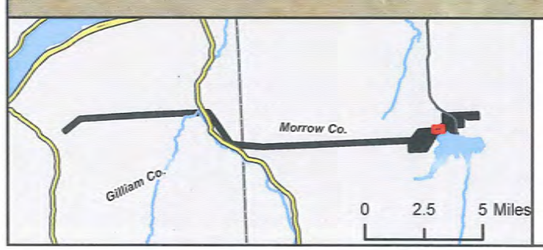
Field Data Accurate to +/- 1 meter

Figure 5.1.2:
Wetlands H, WW-002-001, and WW-004-001

PGE Carty Generating Station
December 2013

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N

0 125 250 500 Feet

1 inch = 200 feet

Site Boundary
Access Road
Tax Lots

2012 / 2013 E&E Field Data
Wetlands
Photo Location

InvestigativeWetland Point (XW)
2009 E&E Field Data
Soil Sample
Upland
Wetland

Field Data Accurate to +/- 1 meter

DSL WD # 2010-0023 4of11

Approval Issued 12/24/2013

Approval Expires 12/24/2018

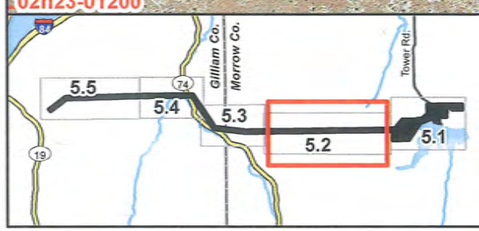
Figure 5.1.3:
Wetland B Area

PGE Carty Generating Station

December 2013

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N

0 0.25 0.5 1 Miles

0 0.25 0.5 1 Kilometers

- Site Boundary
- Proposed Energy Facility Area
- Temporary Construction Area
- Proposed Grassland Switchyard
- Tax Lots
- Access Road
- Field Delineated Wetland
- Stream Features
- Reference Location

DSL WD # 2010-0023 5 of 11

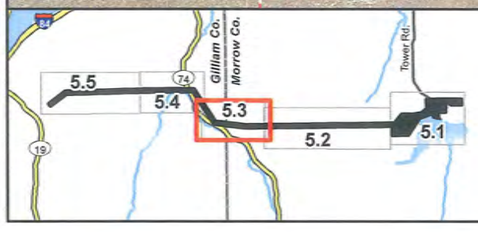
Approval Issued 12/24/2013

Approval Expires 12/24/2018

Figure 5.2
Wetland and Watebodies Map Tile Overview, including Tax Lot Boundaries
PGE Carty Generating Station
December 2013

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03N22E-700
03N22E-2100
03n23-00100
03N22E-3602
03N22E-700
Gilliam County
Morrow County
FIGURE 5.3.2
FIGURE 5.3.1
02N22E-300
02N22E-3800
02N22E-200
Wetland D
Wetland C
02N22E-100
02n23-00100
02N22E-500
02n23-04400
02n23-00100
02N22E-400
02n23-00700
02n23-00900



N

0 0.25 0.5 1 Miles

0 0.25 0.5 1 Kilometers

- Site Boundary
- Proposed Energy Facility Area
- Temporary Construction Area
- Proposed Grassland Switchyard
- Tax Lots
- Access Road
- Field Delineated Wetland
- Stream Features

DSL WD # 2010-0023 6 of 11

Approval Issued 12/24/2013

Approval Expires 12/24/2018

Figure 5.3
Wetland and Watebodies Map Tile Overview, including Tax Lot Boundaries
PGE Carty Generating Station
December 2013

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03n23-00100

Wetland extends to the NE beyond Study Area

C-6

0387 - SW

C-1
C-2

U01
0381 - N

0388

U01
0416 - E/SE
0417 - NE

WW-002-010

0418 - E
0419 - NE

Road ends and will not cross wetland area.

Wetland C

U02
0385 - NW
0386 - SW

W01
0382 - SE
0383 - W
0384 - SE

W01
0414 - SW
0415 - NW

U01
0394 - SW
0393 - W

B
0398 - S
0399 - S

A

0395 - S
0396 - N/NE
0397 - SW

C-4
C-5

C-3

C-7

Road ends and will not cross wetland area.

02n23-00100

Geographic Reference Location
(45.688796, -119.968501)

Intermittent stream - SS-002-001

MAXIMUM WIDTH AT OHWM = 2ft.

W01
0389 - NW
0390 - W
0391 - NE

WW-002-011

U01
0400 - NW
0401 - W

W01
0402 - W

C

WW-002-009

U01
0404 - W

0412 - N/NW
0413 - W/NW

WW-002-012

0405 - S/SW

W01
0408 - W/NW
0409 - N
0410 - E/NE

Stream extends to the SW beyond Study Area



* SS-002-001 intermittent & jurisdictional within study area OHWM MAX WIDTH = 2ft.

N

0 125 250 500 Feet

1 inch = 200 feet

Site Boundary
Access Road
Tax Lots

2012 / 2013 E&E Field Data
Wetlands
Delineated Water Features
Photo Location

SDAM Points

Soil Points
Upland
Wetland

Field Data Accurate to +/- 1 meter

DSL WD # 2010-0023 7 of 11

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Approval Expires 12/24/2018

Figure 5.3.1:
Wetland C Area

PGE Carty Generating Station

December 2013

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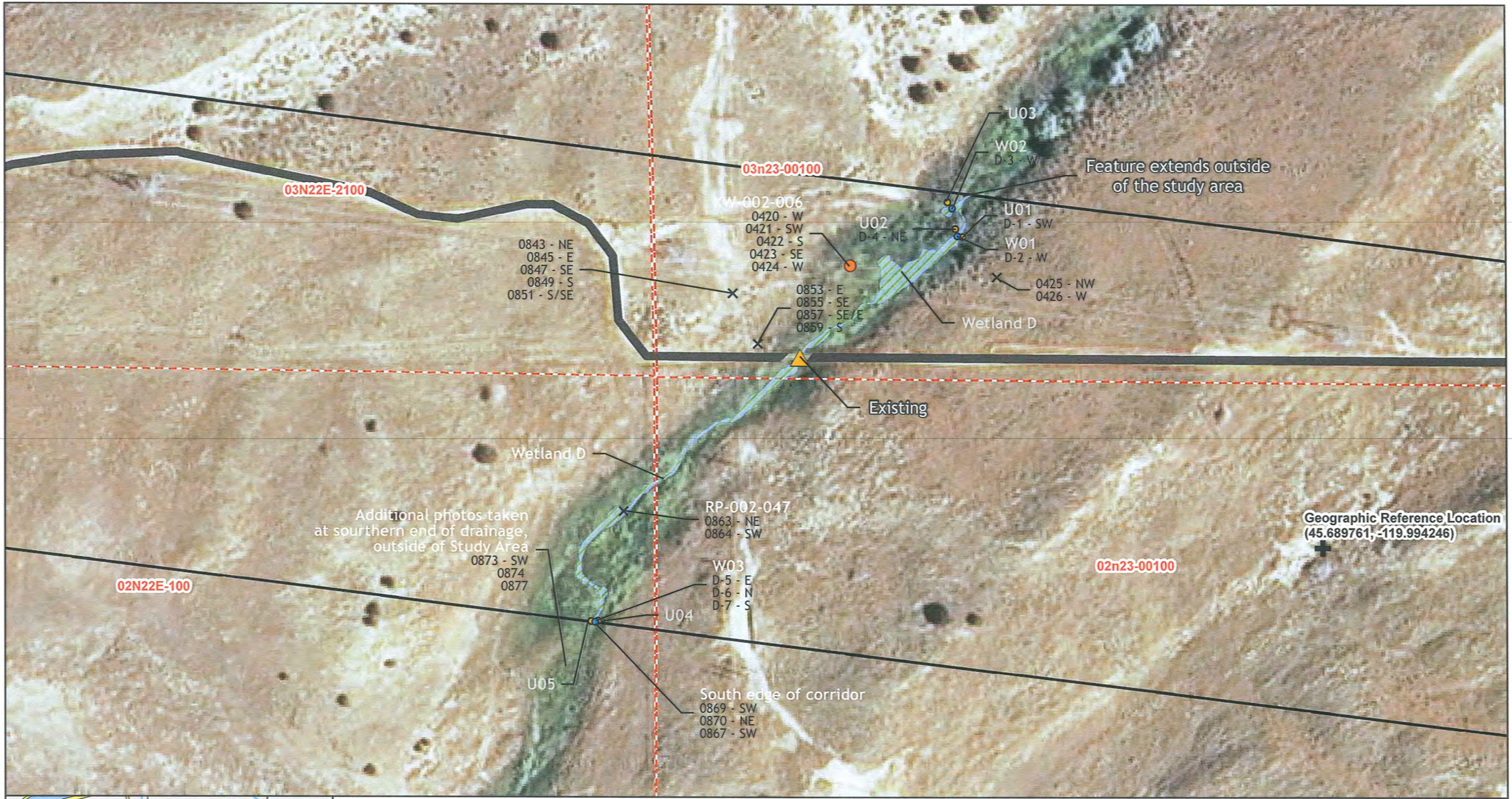


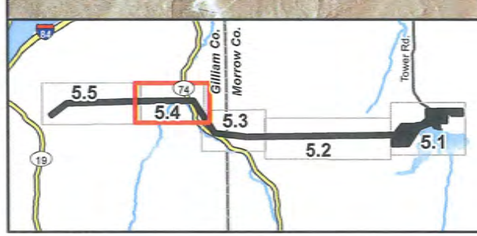
Figure 5.3.2:
Wetland D Area

DSL WD # 2010-0023 Bofll
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Approval Expires 12/24/2018

PGE Carty Generating Station
December 2013

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03N22E-2000
03N22E-1903
03N22E-1302
03N22E-1900
03N22E-700
03N22E-2300
03N22E-3605
03N22E-2202
FIGURE 5.4.1
03N22E-700
03N22E-3601
03N22E-2100
Eightmile Canyon Creek
Willow Creek
03N22E-2201
03N22E-2501
03N22E-2502
03N22E-2203
03N22E-2200
03N22E-700
03N22E-3000
03N22E-3602



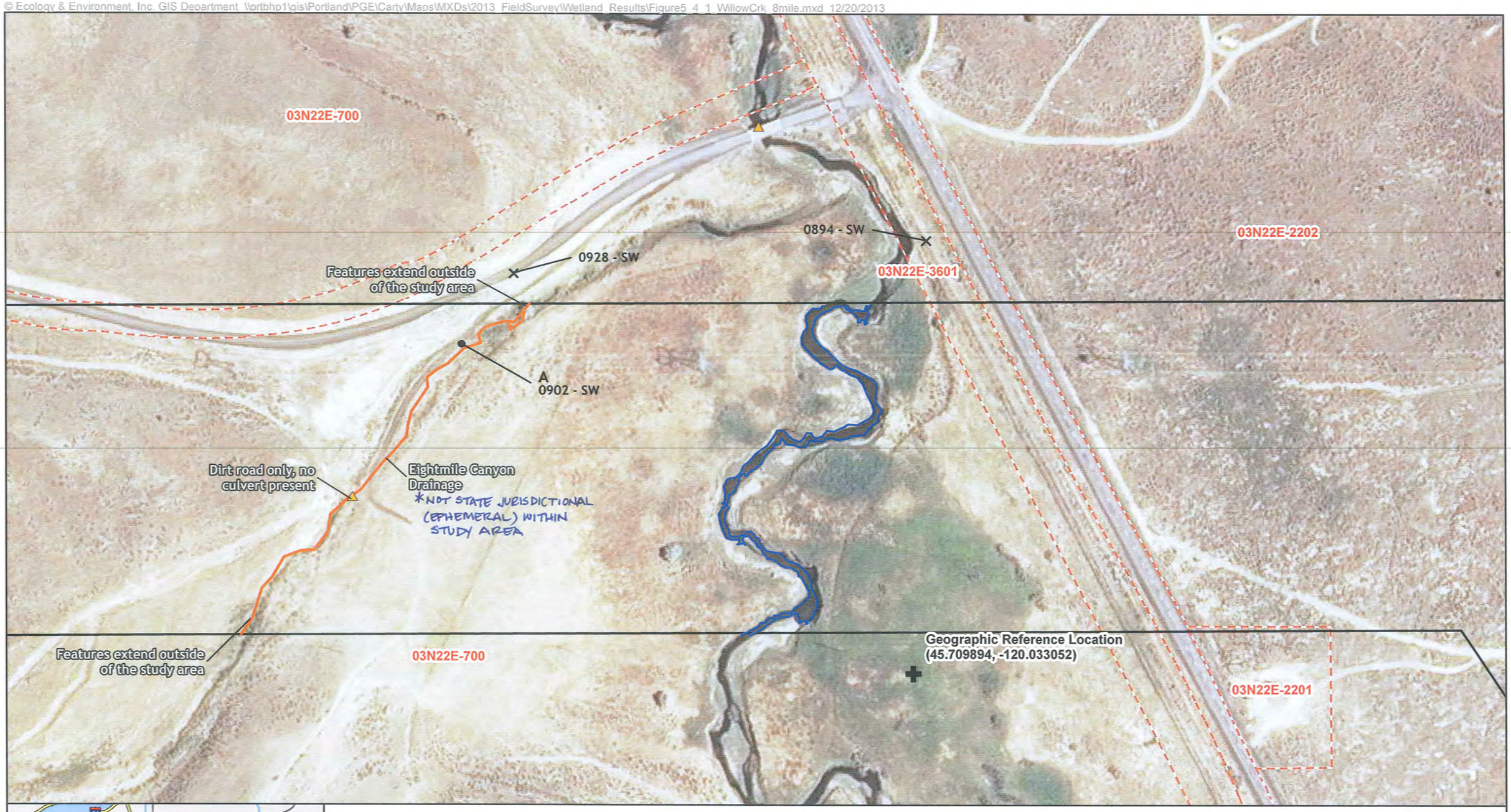
Site Boundary
Proposed Energy Facility Area
Temporary Construction Area
Proposed Grassland Switchyard
Tax Lots
Access Road
Field Delineated Wetland
Stream Features

N
0 0.25 0.5 1 Miles
0 0.25 0.5 1 Kilometers

DSL WD # 2010-0023 9 of 11
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Figure 5.4
Wetland and Watebodies Map Tile Overview, including Tax Lot Boundaries
PGE Carty Generating Station
December 2013

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DSL WD # 2010-0023 10 of 11

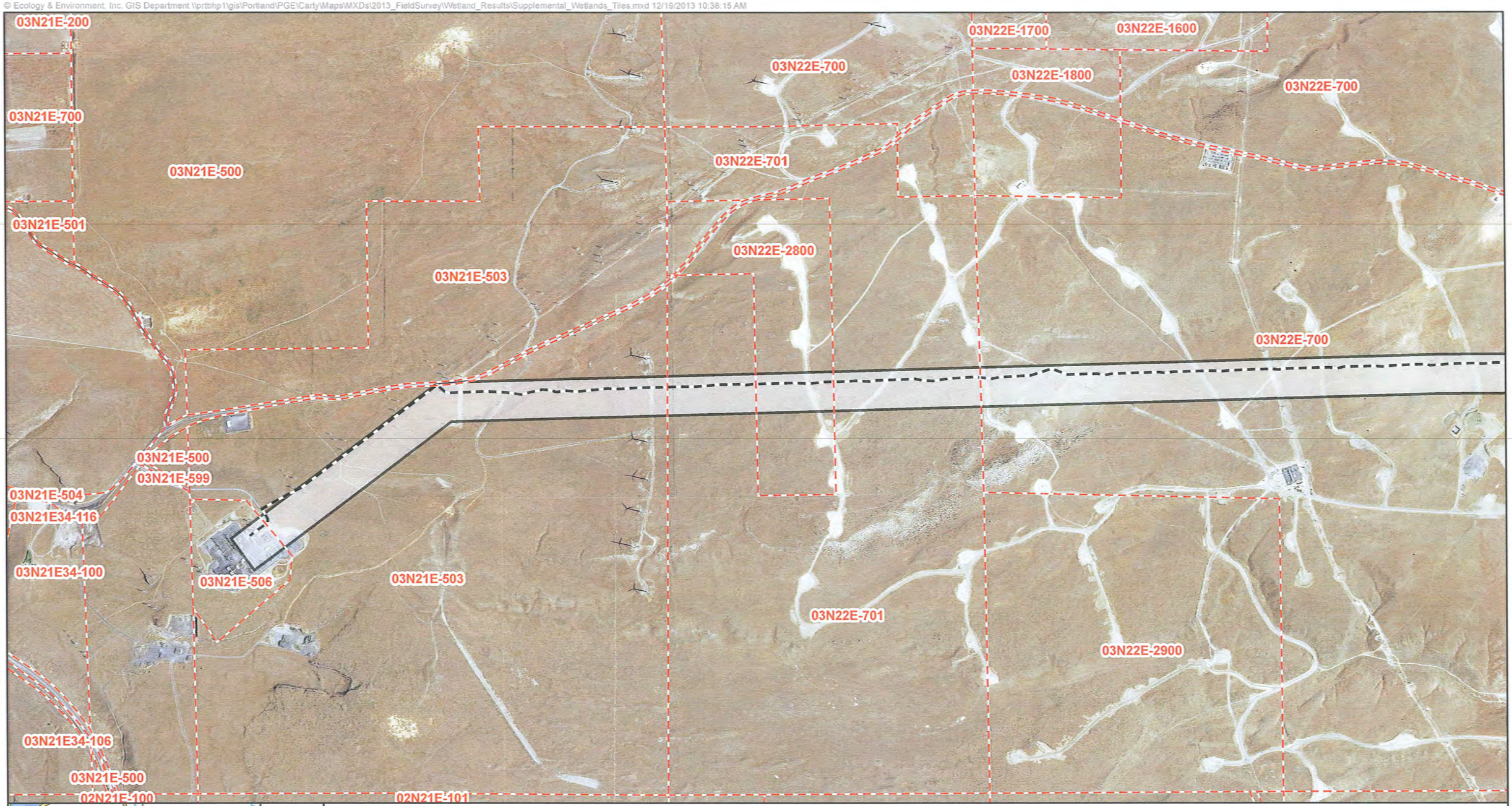
Approval Issued 12/24/2013

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Figure 5.4.1: Willow Creek and Eightmile Drainage

PGE Carty Generating Station
December 2013

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DSL WD # 2010-0023 11 of 11

Approval Issued 12/24/2013

Approval Expires 12/24/2018

Figure 5.5
Wetland and Watebodies Map Tile Overview, including Tax Lot Boundaries
PGE Carty Generating Station
December 2013

EXHIBIT K – Request for Amendment No. 1

LAND USE (STATEWIDE PLANNING GOALS)
OAR 345-021-0010(1)(k)

TABLE OF CONTENTS

K.1 INTRODUCTION K-1

K.2 LAND USE ANALYSIS AREA K-4

K.3 LOCAL LAND USE APPROVAL K-5

K.4 COUNCIL DETERMINATION ON LAND USE K-5

K.5 MORROW COUNTY K-7

K.5.1 General Industrial Zone (MG) K-7

K.5.2 Exclusive Farm Use Zone K-10

K.5.3 Other Zoning Provisions K-24

K.5.4 Comprehensive Plan K-33

K.6 DIRECTLY APPLICABLE STATUTES AND ADMINISTRATIVE RULES K-35

K.6.1 Directly Applicable Statutes K-35

K.6.2 Directly Applicable Administrative Rules K-36

K.6.3 Exception to Statewide Planning Goal 3 ..... K-37

K.7 FEDERAL LAND MANAGEMENT PLANS K-43

TABLES

Table K-1 Land Area/Zoning Description K-4

Table K-2 Soils Classification, Morrow County – Carty Solar Farm Generation Facility Site, Permanent Impacts on Exclusive Farm Use Zoned Land K-18

FIGURES

Figure K-1 Morrow County Comprehensive Plan / Zoning Designation

K.1 INTRODUCTION

OAR 345-021-0010(1)(k) *Exhibit K. Information about the proposed facility's compliance with the statewide planning goals adopted by the Land Conservation and Development Commission, providing evidence to support a finding by the Council as required by OAR 345-022-0030. The applicant shall state whether the applicant elects to address the Council's land use standard by obtaining local land use approvals under ORS 469.504(1)(a) or by obtaining a Council determination under ORS 469.504(1)(b). An applicant may elect different processes for an energy facility and a related or supporting facility but may not otherwise combine the two processes. Once the applicant has made an election, the applicant may not amend the application to make a different election. In this subsection, "affected local government" means a local government that has land use jurisdiction over any part of the proposed site of the facility.*

Response: This exhibit provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(k) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). This exhibit addresses the changes in land use for the Carty Solar Farm, as proposed under the RFA, all of which would be located under the land use jurisdiction of Morrow County on land zoned Exclusive Farm Use (EFU) or General Industrial (MG). The analysis area for this exhibit is the area within the amended Site Boundary and one-half mile from the amended Site Boundary.

As described in Exhibit B, Section B.1, Pacific Gas and Electric Company (PGE) defines the term "Carty Solar Farm" to include the following energy facility and related and supporting project components:

- Solar photovoltaic (PV) generation facility;
- Related or supporting facilities, including the interconnection transmission line routes and interconnection options described in Section B.3;
- Temporary construction laydown and parking areas; and
- Several areas in the new portions of the amended Site Boundary where PGE currently does not propose permanent or temporary disturbances, but that are being included to accommodate potential small changes during the final project design stage.

As described in Section B.2, the proposed additions related to the Carty Solar Farm are:

Carty Solar Farm generation facility: The Carty Solar Farm generation facility would consist of multiple PV solar arrays with a nominal capacity of approximately 50 megawatts (MW). In addition to the PV panels mounted on a racking system, the Carty Solar Farm generation facility would include direct current combiners at the end of array rows; underground lines routing direct

current combiner output to inverter stations; and an alternating current collection system for the output of the inverter stations. Electrical energy produced by the Carty Solar Farm generation facility would be collected and routed to the switchgear adjacent to the entry gate, near the northeast corner of the Carty Solar Farm generation facility. The combined output of the Carty Solar Farm generation facility would be routed from the switchgear through underground conductors to the northeast corner of the property, where the conductors transition from underground to overhead. The Carty Solar Farm generation facility would be surrounded by a security fence, which likely would consist of 8-foot chain link topped by an additional foot of barbed wire. Access roads would be constructed along the interior of the array field to allow for maintenance of each of the inverter stations. Figure B-5 in Exhibit B provides a detailed layout of the Carty Solar Farm generation facility. The Carty Solar Farm generation facility would be located entirely on land zoned EFU.

Interconnection Options and Transmission Routes: As shown on Figure B-4 in Exhibit B, PGE is seeking approval to interconnect the Carty Solar Farm generation facility at any of three interconnection options, with a total of five alternative transmission line routes. All five transmission line routes cross land zoned EFU and MG.

At the northeast corner of the Carty Solar Farm generation facility site, the conductors transition from underground to overhead. The transmission line would continue overhead along the east side of the reservoir to one of the potential interconnection points described below. The Carty Solar Farm interconnection transmission line would be a 34.5 kilovolt (kV) line. The final transmission line configuration will be determined during detailed design. The transmission line would be mounted on wooden poles approximately 70 feet high, depending on location and span length. Again, specific dimensions of poles will be determined during detailed design.

Five potential transmission line routes for the following three interconnection options would be of the same approximate design (see Figure B-4). The transmission lines from the Carty Solar Farm generation facility to the interconnection options would be between approximately 2.25 and 3 miles, depending on the route selected.

Option 1: Grassland 500kV Interconnect

The proposed interconnection at the existing Grassland Switchyard would consist of adding a ring bus position to the existing 500 kV bus. A new 500/35kV 50 megavolt ampere (MVA) transformer would be connected to the new bus position. Circuit breakers (500 kV and 3 5kV), disconnect switches, a voltage transformer, and other associated equipment would be added to connect and isolate the new interconnection. Protective relay panels would be added to the existing relay enclosure. The potential route for this interconnection option follows the northeastern edge of the Carty Reservoir and then turns west to the Grassland Switchyard.

Option 2: Carty Unit 1 Isophase Interconnect

The proposed interconnection at Unit 1 would consist of modifying the existing combustion turbine isophase bus duct to allow for a new tap. A new 35/21kV 50MVA transformer would be connected to the new isophase bus duct tap. Circuit breakers (35kV), disconnect switches, and other associated equipment would be added to connect and isolate the new interconnection. Protective relay panels would be added as well. The interconnection at Unit 1 is on land zoned EFU and authorized under the Site Certificate for development of Unit 1. There are two transmission variants for this interconnection option: Route 2a would extend north from the Carty Solar Farm generation facility, then west along the northeastern edge of the Carty Reservoir, then north to Unit 1, and Route 2b would extend north from the Carty Solar Farm generation facility and then west through the Boardman Plant train loop to Unit 1.

Option 3: Boardman Plant Interconnect

The proposed interconnection at the Boardman Plant would consist of adding a new 500 kV substation in a straight bus arrangement. The new substation would be located just northwest of the existing Boardman Plant. A new 500/35kV 50MVA transformer would be connected to the new bus. Circuit breakers (500 kV and 35 kV), disconnect switches, a voltage transformer, and other associated equipment would be required to connect and isolate the new interconnection. Protective relay panels would be added to the existing relay enclosure. This option would require the use of an approximately 265- by 280-foot area located on the northwestern edge of the main Boardman Plant building, and immediately east of the proposed breaker switch and disconnect. The interconnection at the Boardman Plant is on land zoned MG. There are two transmission variants for this interconnection option: Route 3a would extend north from the Carty Solar Farm generation facility, then west along the northeastern edge of the Carty Reservoir, then north to the Boardman Plant, and Route 3b would extend north from the Carty Solar Farm generation facility, then west through the Boardman Plant train loop, and then south to the Boardman Plant.

Grassland Switchyard: The Grassland Switchyard is on land zoned EFU, was approved with a 15-acre permanent disturbance footprint in the 2012 Site Certificate, and was constructed in 2015; however, the current constructed footprint covers only 8.5 acres. Under this RFA, if Interconnection Option 1 is selected, PGE would build out the switchyard perimeter fence line on the south and southwest sides to occupy an area up to the previously approved 15-acre area. No additional acres of permanent ground disturbance are requested under this RFA.

In addition, PGE expects that up to 7.5 acres would be needed for temporary laydown areas at the Grassland Switchyard for construction of the Cary Solar Farm (see Exhibit C, Table C-2).

Final fence configuration would be similar to the existing switchyard perimeter fence, which consists of 8-foot chain link topped by an additional foot of barbed wire. Buildout of the

switchyard would be on land zoned EFU and would not result in a change to the original Site Boundary.

Although a 15-acre Grassland Switchyard was approved in the Final Order,[1] PGE no longer plans to construct Unit 2 and therefore would not be expanding the Grassland Switchyard to 15 acres but for the development of the Carty Solar Farm. Therefore, this exhibit addresses land use compliance for the Grassland Switchyard.

K.2 LAND USE ANALYSIS AREA

OAR 345-021-0010(1)(k)(A) *Include a map showing the comprehensive plan designations and land use zones in the analysis area.*

Response: For Morrow County, the comprehensive plan designation is the same as the zoning map designation. Figure K-1 shows the comprehensive plan and zoning designations for all land within the amended Site Boundary and adjacent lands.

Table K-1 provides a summary of the acreage of potential impacts that would be encompassed by the Carty Solar Farm generation facility and temporary construction laydown and parking areas as proposed under this RFA. This analysis excludes the Grassland Switchyard and transmission lines, as these are, respectively, "utility facilities necessary for public service" under ORS 215.275 and "associated transmission lines" under ORS 215.274, and the permanent footprint of those facilities is not relevant to the analysis required under those statutes. The Carty Solar Farm generation facility and temporary construction laydown and parking areas fall within two zoning designations in Morrow County: Exclusive Farm Use (EFU) and General Industrial (MG).

Table K-1 Land Area/Zoning Description

Land Areas (Acres)	Morrow County	
	EFU	**MG**
Carty Solar Farm Generation Facility Site – Permanent Areas	315	0
Carty Solar Farm Construction Laydown and Parking – Temporary Areas	34	45
TOTAL	**349**	**45**

Last updated February 6, 2018
Key:
EFU = Exclusive Farm Use
MG = General Industrial

[1] References to the "Final Order" are to the Council's Final Order of June 29, 2012, approving the issuance of the Site Certificate for the Carty Generating Station.

K.3 LOCAL LAND USE APPROVAL

OAR 345-021-0010(1)(k)(B) *If the applicant elects to obtain local land use approvals:*

(i) Identify the affected local government(s) from which land use approvals will be sought.

(ii) Describe the land use approvals required in order to satisfy the Council's land use standard.

(iii) Describe the status of the applicant's application for each land use approval.

(iv) Provide an estimate of time for issuance of local land use approvals.

Response: PGE intends to obtain an Oregon Energy Facility Siting Council (Council) determination on land use; therefore, this requirement does not apply.

K.4 COUNCIL DETERMINATION ON LAND USE

OAR 345-021-0010(1)(k)(C) *If the applicant elects to obtain a Council determination on land use:*

(i) Identify the affected local government(s).

Response: Morrow County is the affected local government for the proposal in this RFA.[2]

(ii) Identify the applicable substantive criteria from the affected local government's acknowledged comprehensive plan and land use regulations that are required by the statewide planning goals and that are in effect on the date the application is submitted and describe how the proposed facility complies with those criteria.

Response: The applicable substantive criteria of the Morrow County Zoning Ordinance (MCZO) and Morrow County Comprehensive Plan are addressed in Section K.5. The substantive criteria are:

MCZO 3.070 General Industrial Zone, MG
MCZO 3.010 Exclusive Farm Use, EFU

[2] To obtain the Site Certificate for the Carty Generating Station, PGE obtained the Council's determination of compliance with statewide planning goals under ORS 469.504(1)(b), or "Path B." The Council appointed the Morrow County Court and the Gilliam County Court as Special Advisory Groups. The only proposed element of the Carty Generating Station located in part in Gilliam County was a new 500-kV transmission line from the Grassland Switchyard (in Morrow County) to the Slatt Substation (in Gilliam County). As discussed in Exhibit B of this RFA, PGE no longer plans to construct that transmission line. Therefore, the amended Site Boundary is limited to Morrow County.

MCZO 1.050 Zoning Permit
MCZO 4.165 Site Plan Review
MCZO 6.015. Requirements Under a State Energy Facility Site Certificate
MCZO 6.020. General Criteria
MCZO 6.025. Resource Zone Standards for Approval
MCZO 6.030. General Conditions

Morrow County Comprehensive Plan

Agricultural Element, Policies 1 and 4
Energy Conservation Element, Policies 3 and 9
Economic Element, Policies 2A, 3A, 5A and 6C

(iii) Identify all Land Conservation and Development Commission administrative rules, statewide planning goals and land use statutes directly applicable to the facility under ORS 197.646(3) and describe how the proposed facility complies with those rules, goals and statutes.

Response: State statutes and Land Conservation and Development Commission administrative rules directly applicable to the facility are addressed in Section K.6 of this exhibit. The statutes and administrative rules are:

ORS 215.274
ORS 215.275
ORS 215.283(1)(c)
ORS 215.283(2)(g)
ORS 215.296(1)

OAR 660-033-130(5)
OAR 660-033-0130(16)
OAR 660-033-0130(38)

(iv) If the proposed facility might not comply with all applicable substantive criteria, identify the applicable statewide planning goals and describe how the proposed facility complies with those goals.

Response: As discussed in this exhibit, the proposed facility complies with all substantive criteria, with the exception that the Carty Solar Farm generation facility would occupy more than 12 acres of high-value farmland and more than 20 acres of "other" land in the EFU zone. Therefore, PGE is requesting an exception to Statewide Planning Goal 3 for the Carty Solar Farm generation facility.

(v) If the proposed facility might not comply with all applicable substantive criteria or applicable statewide planning goals, describe why an exception to any applicable statewide planning goal is justified, providing evidence to support all findings by the Council required under ORS 469.504(2).

Response: As discussed in this exhibit, the Carty Solar Farm generation facility would not comply with the requirement of the Statewide Planning Goal 3 implementing rule because it would occupy more than 12 acres of high-value farmland and more than 20 acres of "other" land in the EFU zone. Therefore, PGE is requesting an exception to Statewide Planning Goal 3 for the Carty Solar Farm generation facility.

K.5 MORROW COUNTY

K.5.1 General Industrial Zone (MG)

Portions of all five alternative transmission routes would cross land zoned MG; in addition, one transmission interconnection option (Option 3 – Boardman Plant Interconnect) would occupy an approximately 265- by 280-foot (1.7-acre) area zoned MG on the west side of the Boardman Power Plant building.

MCZO 3.070 GENERAL INDUSTRIAL ZONE, MG

The General Industrial Zone is intended to provide, protect and recognize areas well suited for medium and heavy industrial development and uses free from conflict with commercial, residential and other incompatible land uses. This district is intended to be applied generally only to those areas which have available excellent highway, rail or other transportation.

Response: The MG zoning in this location is the result of an exception taken under the Comprehensive Plan, which states: "This parcel of 640 acres is the site of a PGE coal fire plant and is completely developed and no longer available of [sic] resource uses." The uses proposed within the MG zone in this RFA are transmission-related facilities permitted outright in the MG zone pursuant to MCZO 3.070.A and consistent with the commitment of the 640-acre Boardman Plant site to use for generation of electric power.

MCZO 3.070.A Uses Permitted Outright

A. Uses Permitted Outright. In an M-G Zone, the following uses and their accessory uses are permitted outright; except as limited by subsection C of this section. A Zoning Permit is required and projects larger than 100 acres are subject to Site Development Review (Article 4 Supplementary Provisions Section 4.170 Site Development Review).

Response: Condition 4.6 of the Site Certificate requires that the certificate holder obtain all local permits, including a Zoning Permit for the entire facility. MCZO 4.170.C.1 provides: "Site development review shall be required for all major developments *in industrial and commercial zones.* As used in this Section, a 'major development' is an industrial development utilizing 100 or more acres of real property." The facilities proposed in this RFA, by themselves or cumulatively with Unit 1, do not utilize 100 acres or more in the MG zone. Therefore, site development review is not required.[3]

15. Utility, transmission and communications towers less than 200 feet in height.

Response: The transmission line poles for the transmission routes proposed in this RFA are expected to be approximately 70 feet tall. Therefore, the transmission line alternatives are uses permitted outright in the MG zone.

MCZO 3.070C. Use Limitations.

In an M-G Zone, the following limitations and standards shall apply to all permitted uses:

1. No use permitted under the provisions of this section that requires a lot area exceeding two (2) acres shall be permitted to locate adjacent to an existing residential lot in a duly platted subdivision, or a lot in a residential zone, except as approved by the Commission.

Response: There are no residentially zoned lands or residential uses adjacent to the project area. Therefore, this standard does not apply.

2. No use permitted under the provisions of this section that is expected to generate more than 20 auto-truck trips during the busiest hour of the day to and from the subject property shall be permitted to locate on a lot adjacent to or across the street from a residential lot in a duly platted subdivision, or a lot in a residential zone.

Response: There are no residentially zoned lands or residential uses adjacent to the project area. Therefore, this standard does not apply.

MCZO 3.070.D Dimension Requirements

The following Dimensional requirements apply to all buildings and structures constructed, placed or otherwise established in the MG zone.

[3] A new version of MCZO Article 4 ("Supplementary Provisions") took effect on February 1, 2018. MCZO 4.170 is not part of the new Article 4.

1. Lot size and frontage: A minimum lot size has not been determined for this zone although the lot must be of a size necessary to accommodate the proposed use, however, it is anticipated that most, if not all uses will be sited on lots of at least two acres. The determination of lot size will be driven by the carrying capacity of the land given the proposed use. Minimum lot frontage shall be 300 feet on an arterial or collector; 200 feet on a local street.

Response: The lot on which the MG-zoned transmission facilities would be located is irregular in shape and is adequate to accommodate the proposed transmission facilities and the proposed interconnection (Option 3 – Boardman Plant Interconnect) that would occupy an approximately 1.7-acre area on the west side of the Boardman Plant building. The portion of Tower Road under private ownership extends through the lot for nearly 5,000 feet, well over the minimum amount of frontage required under this standard.

2. Setbacks: No specific side or rear yard setbacks are identified within this zone, but may be dictated by provisions of the Building Code or other siting requirements. The minimum setback between a structure and the right-of-way of an arterial shall be 50 feet. The minimum setback of a structure from the right-of-way of a collector shall be 30 feet, and from all lower class streets the minimum setback shall be 20 feet. There shall be no setback requirement where a property abuts a railroad siding or spur if the siding or spur will be utilized by the permitted use.

Response: Condition 6.22.a of the Site Certificate requires compliance with these setbacks. However, Tower Road terminates at the Boardman Plant and is classified as a private roadway for approximately 2.27 miles. This provision of the MCZO does not require setbacks along the private portion of Tower Road. In addition, as indicated in Condition 6.22, the setbacks do not apply to transmission lines.

3. Stream Setback: All sewage disposal installations such as outhouses, septic tank and drainfield systems shall be set back from the high-water line or mark along all streams and lakes a minimum of 100 feet, measured at right angles to the high-water line or mark. All structures, buildings, or similar permanent fixtures shall be set back from the high-water line or mark along all streams or lakes a minimum of 10 feet measured at right angles to the high-water line or mark.

Response: Condition 6.22.a.ii of the Site Certificate requires compliance with these setbacks where applicable. No new sewage disposal installations are proposed in this RFA. Therefore, these requirements do not apply.

4. Uses adjacent to residential uses. A sight-obscuring fence shall be installed to buffer uses permitted in the General Commercial Zone from residential uses. Additional landscaping or buffering such as diking, screening, landscaping or an evergreen hedge may be required as deemed necessary to preserve the values of nearby properties or to protect the aesthetic character of the neighborhood or vicinity.

Response: This requirement likely was intended to refer to buffering uses "permitted in the General Industrial Zone." In any event, there are no residential uses within proximity of the site.

MCZO 3.070.E. Transportation Impacts

1. Traffic Impact Analysis (TIA). In addition to the other standards and conditions set forth in this section, a TIA will be required for all projects generating more than 400 passenger car equivalent trips per day. Heavy vehicles B trucks, recreational vehicles and buses B will be defined as 2.2 passenger car equivalents. A TIA will include: trips generated by the project, trip distribution for the project, identification of intersections for which the project adds 30 or more peak hour passenger car equivalent trips, and level of service assessment, impacts of the project, and, mitigation of the impacts. If the corridor is a State Highway, use ODOT standards. (MC-C-8-98)

Response: Exhibit U includes estimates of potential traffic associated with the Carty Solar Farm. The "400 passenger car equivalent trips per day" might be reached during construction of the Carty Solar Farm, but not during operation. PGE would consult with Morrow County prior to the start of construction, when staging and workforce issues are better known, and will prepare a Traffic Impact Analysis if the 400 trips per day threshold would be exceeded.

In addition, Condition 6.17 requires the certificate holder to implement specified measures to reduce traffic impacts during construction.

K.5.2 Exclusive Farm Use Zone

MCZO 3.010. EXCLUSIVE FARM USE, EFU ZONE

As discussed in Section K.1, this RFA proposes three facility elements in the EFU zone: the Carty Solar Farm generation facility itself; portions of each of the five alternative transmission/ interconnection routes; and the buildout of the Grassland Switchyard (if PGE selects interconnection Option 1) up to the full 15-acre permanent footprint originally approved in the Final Order. As discussed below, however, each of these three elements is a distinct "use" under MCZO 3.010. The buildout of the Grassland Switchyard is a "utility facility necessary for public service" reviewed under MCZO 3.010.D.10.a. The transmission lines in the EFU zone are

"associated transmission lines necessary for public service" reviewed under MCZO 3.010.D.10.b. The Carty Solar Farm generation facility itself is a "photovoltaic solar power generation facility" reviewed under MCZO 3.010.K.3.

MCZO 3.010.B. Uses Permitted Outright.

> *In the EFU zone, the following uses and activities and their accessory buildings and uses are permitted subject to the general provisions set forth by this ordinance:*
>
> *24. Utility facilities necessary for public service, including associated transmission lines as defined in Article 1 and wetland waste treatment systems, but not including commercial facilities for the purpose of generating electrical power for public use by sale or transmission towers over 200 feet in height as provided in Subsection D.10.*

Response: This provision encompasses both the buildout of the Grassland Switchyard (a "utility facility necessary for public service") and the transmission alternatives (each an "associated transmission line"). The applicable use standards for the Grassland Switchyard buildout are those set forth in MCZO 3.010.D.10.a; the standards for the transmission alternatives as "associated transmission lines" are set forth in MCZO 3.010.D.10.b.

Grassland Switchyard Buildout

MCZO 3.010.D.10. A utility facility that is necessary for public service.[4]

> *a. A utility facility is necessary for public service if the facility must be sited in the exclusive farm use zone in order to provide the service.*
>
> *(1) To demonstrate that a utility facility is necessary, an applicant must show that reasonable alternatives have been considered and that the facility must be sited in an exclusive farm use zone due to one or more of the following factors:*
>
> *(a) Technical and engineering feasibility;*
>
> *(b) The proposed facility is locationally-dependent. A utility facility is locationally-dependent if it must cross land in one or more areas zoned for exclusive farm use in order to achieve a reasonably direct route or to meet unique geographical needs that cannot be satisfied on other lands;*
>
> *(c) Lack of available urban and nonresource lands;*

[4] The standards of MCZO 3.010.D.10.a are identical to ORS 215.275 and OAR 660-033-0130(16)(a).

(d) Availability of existing rights of way;

(e) Public health and safety; and

(f) Other requirements of state and federal agencies.

Response: Interconnection of the transmission line at Carty Unit 1 or the Boardman Plant, if technically feasible, is expected to be less expensive than interconnection at the Grassland Switchyard. However, interconnection of one generating facility (for example, the Carty Solar Farm generation facility) at another generating facility (in this case, Carty Unit 1 or the Boardman Plant) raises the likelihood that a service interruption at one facility will result in a cascading service interruption, impacting the other. Interconnection of a generating facility at a switchyard or substation, on the other hand, allows for problems at one generating facility to be isolated from other generating or transmission facilities.

PGE has included in this RFA the more expensive option of interconnecting at the Grassland Switchyard because it is known to be safer, more reliable, and technically feasible. However, PGE expects to complete the buildout of the Grassland Switchyard, to accommodate the Carty Solar interconnection, only if the design phase proves the other two options to be unacceptable due to the increased risk of cascading generating facility outages, or other reasons.

The location of the Grassland Switchyard, on land zoned EFU and entirely surrounded by EFU-zoned land, was approved in the Council's Final Order. The Grassland Switchyard is the point of interconnection with the existing 500 kV Grassland to Slatt transmission line, which connects the Boardman Power Plant and Carty Unit 1 to the grid. Absent the construction of an entirely new transmission line connecting the Carty Solar Farm to the grid, there is no other means of transmitting electric power generated at the Carty Solar Farm generation facility to the grid. If technical and engineering feasibility requires connection at a switchyard or substation, any other alternative would require more impacts to EFU-zoned land.

In addition, the uncultivated EFU land south and east of the Carty Solar Farm generation facility site is owned by Threemile Canyon Farms, LLC and managed by The Nature Conservancy (TNC) as conservation land in accordance with the terms of the Multi-Species Candidate Conservation Agreement with Assurances (MSCCAA) dated August 2003,[5] making it unavailable for facilities that would require extensive permanent disturbance such as a switchyard.

(2) Costs associated with any of the factors listed in Subsection (1) may be considered, but cost alone may not be the only consideration in determining that a utility facility is necessary for public service. Land costs shall not be included

[5] The documents for the MSCCAA are available at: https://ecos.fws.gov/ecp0/conservationPlan/plan?plan_id=1123

when considering alternative locations for substantially similar utility facilities and the siting of utility facilities that are not substantially similar.

Response: As stated above, PGE anticipates that the cost of building out the Grassland Switchyard to provide interconnection with the existing 500-kV Grassland to Slatt transmission line would be greater than the cost of interconnection at Carty Unit 1 or the Boardman Plant. Interconnection at the Grassland Switchyard would be pursued for safety, technical, and engineering reasons, not cost savings.

Interconnection at the Grassland Switchyard would be substantially less expensive than alternatives for connecting at a non-PGE switchyard or substation in the area, as no such alternative facilities currently exist. The cost savings, however, result from avoiding the need to construct new and additional facilities that would have greater impact on land zoned EFU; therefore, cost is not the only consideration.

(3) The owner of a utility facility approved under Subsection a shall be responsible for restoring, as nearly as possible, to its former condition any agricultural land and associated improvements that are damaged or otherwise disturbed by the siting, maintenance, repair or reconstruction of the facility. Nothing in this Subsection shall prevent the owner of the utility facility from requiring a bond or other security from a contractor or otherwise imposing on a contractor the responsibility for restoration.

Response: The buildout of the Grassland Switchyard would be entirely on land that is not cultivated and lacks any improvements associated with agricultural use. Nonetheless, the Site Certificate already includes conditions requiring restoration of land temporarily disturbed during construction and addressing impacts to land disturbed during facility operation. These include Conditions 9.1 through 9.7.

(4) The county shall impose clear and objective conditions on an application for utility facility siting to mitigate and minimize the impacts of the proposed facility, if any, on surrounding lands devoted to farm use in order to prevent a significant change in accepted farm practices or a significant increase in the cost of farm practices on surrounding farmlands.

Response: Buildout of the Grassland Switchyard is not anticipated to impact nearby lands devoted to farm use. Nonetheless, as discussed above, the Site Certificate includes conditions to address impacts that arise during construction or operation.

(5) Utility facilities necessary for public service may include on-site and off-site facilities for temporary workforce housing for workers constructing a utility facility. Such facilities must be removed or converted to an allowed use under the EFU Zone or other statute or rule when project construction is complete. Off-site facilities allowed under this Subsection are subject to Article 6. Temporary

workforce housing facilities not included in the initial approval may be considered through a minor amendment request. A minor amendment request shall have no effect on the original approval.

Response: This RFA does not include on-site or off-site facilities for temporary workforce housing.

(6) In addition to the provisions of Subsection D.10.a(1) through (4), the establishment or extension of a sewer system as defined by OAR 660-011-0060(1)(f) shall be subject to the provisions of 660-011-0060.

Response: This RFA does not include establishment or extension of a sewer system as defined by OAR 660-011-0060(1)(f).

(7) The provisions of Subsection a do not apply to interstate natural gas pipelines and associated facilities authorized by and subject to regulation by the Federal Energy Regulatory Commission.

Response: This RFA does not include an interstate natural gas pipeline under Federal Energy Regulatory Commission jurisdiction.

Transmission Alternatives

MCZO 3.010.D.10. A utility facility that is necessary for public service.[6]

b. An associated transmission line is necessary for public service upon demonstration that the associated transmission line meets either the following requirements of Subsection (1) or Subsection (2) of this Subsection.

Response: Although MCZO 3.010.B.24 refers to "associated transmission lines as defined in Article 1," there appears to be no definition of "associated transmission lines" in MCZO 1.030 (Definitions). The regulations for "associated transmission lines" in MCZO 3.010.D.10.b, however, parallel ORS 215.274, which incorporates the definition of "associated transmission lines" in ORS 469.300:

(3) "Associated transmission lines" means new transmission lines constructed to connect an energy facility to the first point of junction of such transmission line or lines with either a power distribution system or an interconnected primary transmission system or both or to the Northwest Power Grid.

[6] The standards of MCZO 3.010.D.10.b are identical to ORS 215.274 and OAR 660-033-0130(16)(b).

Whichever transmission option is selected by PGE, it will be necessary to connect the Carty Solar Farm generation facility, which is an "energy facility" as defined in ORS 469.300, to the grid.

As demonstrated below, the transmission alternatives meet the requirements of Subsection (2) of MCZO 3.010.D.10.b.

> *(2) After an evaluation of reasonable alternatives, an applicant demonstrates that the entire route of the associated transmission line meets, subject to Subsections D.10.b(3) and (4), two or more of the following criteria:*
>
> *(a) Technical and engineering feasibility;*
>
> *(b) The associated transmission line is locationally-dependent because the associated transmission line must cross high-value farmland, as defined in ORS 195.300, or arable land to achieve a reasonably direct route or to meet unique geographical needs that cannot be satisfied on other lands;*

Response: PGE has considered alternative transmission routes and is requesting the Council's approval of five alternative routes to three interconnection options. Each transmission alternative utilizes land zoned MG (in which the transmission line is an outright permitted use) in addition to land zoned EFU, thereby reducing impact to land zoned EFU. There is no alternative that can avoid high-value farmland for a simple reason—the entire facility site is located within the Columbia Valley American Viticultural Area (AVA); all EFU land within the Columbia Valley AVA is "high-value farmland" by statute, ORS 195.300(10)(f)(C). The alternatives proposed are reasonably direct; all parallel an existing unimproved road north of the Carty Solar Farm generation facility site at the east end of the Carty Reservoir, avoid all cultivated lands, and avoid lands designated as conservation lands under the MSCCAA.

A route to the west (and then north) from the Carty Solar generation facility would be longer, would not be adjacent to the existing road, and would affect more land zoned EFU as well as land designated for conservation under the MSCCAA. A route directly east of the Carty Solar Farm generation facility is not feasible due to the presence of the Boardman Conservation Area and Naval Weapons Systems Training Facility (NWSTF) Boardman.

> *(c) Lack of an available existing right of way for a linear facility, such as a transmission line, road or railroad, that is located above the surface of the ground;*

Response: PGE has developed transmission alternatives that parallel existing improvements, where possible, including an unimproved road that passes north from the Carty Solar Farm generation facility on the eastern edge of the Carty Reservoir and then through the Boardman Plant train loop (in the MG zone). However, there is no existing right-of-way, or combination of

rights-of-way, between the Carty Solar Farm and the possible points of interconnection at the Boardman Plant, Unit 1, or the Grassland Switchyard.

(d) Public health and safety; or

(e) Other requirements of state or federal agencies.

Response: EFU-zoned land to the east, south, and west of the Carty Solar Farm generation facility is designated a conservation area pursuant to the MSCCAA. The MSCCAA implements provisions of the federal Endangered Species Act, as explained in the MSCCAA:

> *Sections 2, 7, and 10 of the Endangered Species Act of 1973, as amended, and the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), allow USFWS to enter into an MSCCAA. Section 2 of the ESA states that, through Federal financial assistance and a system of incentives, the encouragement of parties to develop and maintain conservation programs is a key to safeguarding the nation's heritage of fish, wildlife, and plants. Section 7 of the ESA requires USFWS to review programs it administers and to utilize such programs in furtherance of the purposes of the ESA. By entering into an MSCCAA, USFWS utilizes its Candidate Conservation Programs to further the conservation of the nation's fish, wildlife, and plants. Section 10(a) of the ESA authorizes the USFWS to issue permits to "enhance the survival" of a listed species.*
>
> *In 1999, USFWS issued its final policy for Candidate Conservation Agreements with Assurances (CCAA) (USFWS 1999, 64 FR 32706-32716 and 64 FR 32726-32736). Under the policy, non-Federal property owners who commit in a CCAA to implement mutually-agreed-upon conservation measures for proposed or candidate species, or species likely to become proposed or candidate species in the future, will receive assurances from USFWS that additional conservation or mitigation measures above and beyond those contained in the CCAA will not be required. Furthermore, the USFWS will not require the participating land owner to commit additional land, water, or financial compensation, or additional restrictions on the use of land, water, or other natural resources beyond the level otherwise agreed upon for the Covered Species should a species covered by the CCAA become listed in the future.*[7]

The private parties to the MSCCAA are Threemile Canyon Farms, LLC, PGE, and TNC. The "Covered Species" for the MSCCAA are the Washington ground squirrel (*Spermophilus washingtoni*), ferruginous hawk (*Buteo regalis*), loggerhead shrike (*Lanius ludovicianus gambeli*), and sage sparrow (*Amphispiza belli*).[8] Pursuant to the MSCCAA, Threemile Canyon

[7] MSCCAA at 3.
[8] MSCCAA at vi.

Farms agreed to place a total of 22,600 acres under a permanent conservation easement.[9] The land owned by Threemile Canyon Farms surrounding the Carty Solar Farm generation facility site on the south and east is part of the "South Farm Conservation Area," subject to the permanent conservation easement. PGE's proposed alternative transmission routes all avoid impacts to the South Farm Conservation Area.

> *(3) As pertains to Subsection (2), the applicant shall demonstrate how the applicant will mitigate and minimize the impacts, if any, of the associated transmission line on surrounding lands devoted to farm use in order to prevent a significant change in accepted farm practices or a significant increase in the cost of farm practices on the surrounding farmland.*

Response: The closest cultivated agricultural land is located 375 feet north and 700 feet west of the Grassland Switchyard. That farming is conducted by Threemile Canyon Farms, which has approximately 35,000 acres under cultivation, all using center pivot irrigation. Construction and maintenance of any of the associated transmission line alternatives would not cross any cultivated land, would not alter or reduce the area under cultivation by Threemile Canyon Farms, would not necessitate relocating any access routes or farm infrastructure, and would not result in changes to the practices for planting, irrigating, fertilizing or harvesting the circles.

> *(4) The county may consider costs associated with any of the factors listed in Subsection (2), but consideration of cost may not be the only consideration in determining whether the associated transmission line is necessary for public service.*

Response: PGE anticipates that the cost of the proposed transmission alternatives would be significantly lower than less direct routes. The cost savings, however, result from avoiding the need to construct a longer transmission line that would impact more land zoned EFU and might require crossing land designated for conservation under the MSCCAA. Therefore, cost is not the only consideration in determining whether the proposed alternatives for the associated transmission line are necessary for public service.

Carty Solar Farm Generation Facility

MCZO 3.010.K.3 PHOTOVOLTAIC SOLAR POWER GENERATION FACILITY

> *3. Photovoltaic Solar Power Generation Facility. A proposal to site a photovoltaic solar power generation facility shall be subject to the following definitions and provisions:*

[9] MSCCAA at 53.

MCZO 3.010.K.3 parallels the requirements under OAR 660-033-0130(38) for siting a PV solar power generation facility on EFU land. The applicable regulations depend on whether the solar power generation facility is located on "high-value farmland," "arable land," or "nonarable land." "High-value farmland" is defined in ORS 195.300(10). The definitions of "arable land" and "nonarable" land are set forth in MCZO 3.010.K.3a-3d:

> *a. "Arable land" means land in a tract that is predominantly cultivated or, if not currently cultivated, predominantly comprised of arable soils.*
>
> *b. "Arable soils" means soils that are suitable for cultivation as determined by the governing body or its designate based on substantial evidence in the record of a local land use application, but "arable soils" does not include high-value farmland soils described at ORS 195.300(10) unless otherwise stated.*
>
> *c. "Nonarable land" means land in a tract that is predominantly not cultivated and predominantly comprised of nonarable soils.*
>
> *d. "Nonarable soils" means soils that are not suitable for cultivation. Soils with an NRCS agricultural capability class V–VIII and no history of irrigation shall be considered nonarable in all cases. The governing body or its designate may determine other soils, including soils with a past history of irrigation, to be nonarable based on substantial evidence in the record of a local land use application.*

Response: The soil classifications on the proposed Carty Solar Farm generation facility are shown on Figure I-1, and are summarized in Table K-2.

Table K-2 Soils Classification, Morrow County – Carty Solar Farm Generation Facility Site, Permanent Impacts on Exclusive Farm Use Zoned Land

NRCS Soil Class	Map Code	Classification	Acreage
Dune land	9	VIIIe Not prime farmland Nonarable Land	32.8 Acres
Sagehill fine sandy loam, 2 to 5 percent slopes	54B	IVe dryland Arable Land	30.1 Acres
		II if irrigated Prime farmland if irrigated	
Sagehill fine sandy loam, hummocky, 2 to 5 percent slopes	55B	IVe dryland Arable Land	245.4 Acres
		II if irrigated Statewide importance	
Sagehill fine sandy loam, hummocky, 5 to	55C	IVe dryland Arable Land	6.2 Acres

Table K-2 Soils Classification, Morrow County – Carty Solar Farm Generation Facility Site, Permanent Impacts on Exclusive Farm Use Zoned Land

NRCS Soil Class	Map Code	Classification	Acreage
12 percent slopes		III if irrigated Statewide Importance	
Arable Lands			281.8 Acres
Nonarable Lands			32.8 Acres
TOTAL impact			314.6 Acres

Notes:
Classifications based on NRCS data.

Key:
Arable Lands = Arable Lands as defined by OAR 660-033-0130(38)
High Value Farmland = High Value Farmland as described in ORS 195.300(10)
Nonarable Lands = Nonarable Lands as defined by OAR 660-033-0130(38)
NRCS = Natural Resources Conservation Service

As discussed above, however, the entire site is located within the Columbia Valley AVA, which extends from approximately The Dalles in the west to Milton-Freewater in the east. Thus, although the site has never been cultivated, has no irrigation rights, and is composed of soils that are not themselves identified as "high-value farmland soils," the entire site is "high-value farmland" pursuant to ORS 195.310(10)(f)(C). The criteria for siting a PV solar power generation facility on high-value farmland are set forth in MCZO 3.010.K.3.f, 3.i, and 3.j.

> *f. For high-value farmland described at ORS 195.300(10), a photovoltaic solar power generation facility shall not preclude more than 12 acres from use as a commercial agricultural enterprise unless an exception is taken pursuant to ORS 197.732 and OAR chapter 660, division 4. The governing body or its designate must find that:*

Response: The Carty Solar Farm generation facility would preclude approximately 315 acres of high-value farmland from use as a commercial agricultural enterprise; therefore, an exception to Statewide Planning Goal 3 is required. For projects under Council jurisdiction, the standards for approving an exception are set forth in ORS 469.504(2)(c) and the Council's rule (which mirrors the statute), OAR 345-022-0030(4). The justification for an exception to Statewide Planning Goal 3 is set forth in Section K.6.3.

> *(1) The proposed photovoltaic solar power generation facility will not create unnecessary negative impacts on agricultural operations conducted on any portion of the subject property not occupied by project components. Negative impacts could include, but are not limited to, the unnecessary construction of roads dividing a field or multiple fields in such a way that creates small or isolated pieces of property that are more difficult to farm, and placing*

photovoltaic solar power generation facility project components on lands in a manner that could disrupt common and accepted farming practices;

Response: There are no agricultural operations on the subject property, which has no known history of cultivation. The neighboring lands to the south and east, while owned by Threemile Canyon Farms, are not cultivated and are subject to a conservation easement under the MSCCAA. The nearest agricultural operations to the proposed Carty Solar Farm generation facility are approximately 1.7 miles from the western edge of the Carty Solar Farm generation facility site and are separated from the Carty Solar Farm generation facility by uncultivated land and the Carty Reservoir. The Carty Solar Farm would not affect infrastructure, including road access, to or within those agricultural operations, and would not affect the ability to plant, irrigate, fertilize or harvest the center pivot circles in question.

(2) The presence of a photovoltaic solar power generation facility will not result in unnecessary soil erosion or loss that could limit agricultural productivity on the subject property. This provision may be satisfied by the submittal and county approval of a soil and erosion control plan prepared by an adequately qualified individual, showing how unnecessary soil erosion will be avoided or remedied and how topsoil will be stripped, stockpiled and clearly marked. The approved plan shall be attached to the decision as a condition of approval;

Response: The potential for soil erosion is addressed in Exhibit I of this RFA. Construction of the Carty Solar Farm would be performed under a National Pollutant Discharge Elimination System 1200-C permit, including an Oregon Department of Environmental Quality–approved Erosion and Sediment Control Plan.

After completing construction in an area, PGE would monitor the area until soils are stabilized, to evaluate whether construction-related impacts to soils are being adequately addressed by the mitigation procedures described in the Erosion and Sediment Control Plan and the Revegetation and Noxious Weed Control Plan (Appendix P-4). As necessary, PGE would implement follow-up restoration measures such as scarification and reseeding to address those remaining impacts.

(3) Construction or maintenance activities will not result in unnecessary soil compaction that reduces the productivity of soil for crop production. This provision may be satisfied by the submittal and county approval of a plan prepared by an adequately qualified individual, showing how unnecessary soil compaction will be avoided or remedied in a timely manner through deep soil decompaction or other appropriate practices. The approved plan shall be attached to the decision as a condition of approval;

Response: After construction of the Carty Solar Farm, scarification of compacted soils would occur as necessary for revegetation. Exhibit I states: "If necessary, areas compacted by construction activities will be ripped to a depth of 12 inches where feasible, and roughened to

provide maximum surface area for seed-soil contact and to reduce the chance of seed loss due to wind."

> *(4) Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weed species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long-term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval;*

Response: Condition 5.5 of the Site Certificate requires that the certificate holder implement a revegetation and weed control plan and comply with the applicable provisions of the Morrow County Weed Control Ordinance, as determined by the Morrow County Weed Control Supervisor. The certificate holder must consult with the Morrow County Weed Control Supervisor and obtain approval of a Revegetation and Noxious Weed Control Plan. The final Revegetation and Noxious Weed Control Plan (included as Appendix P-4) must be submitted to the Oregon Department of Energy for approval prior to the start of construction. Condition 5.5 adequately ensures that construction and maintenance activities at the Carty Solar Farm will not result in the unabated introduction or spread of noxious weeds and other undesirable weed species.

> *(5) The project is not located on high-value farmland soils unless it can be demonstrated that:*
>
> *(a) Non high-value farmland soils are not available on the subject tract;*

Response: The Carty Solar Farm generation facility would be located on land defined by statute as high-value farmland because it is within the Columbia Valley AVA. Due to that statutory designation, there is no EFU land on the subject tract—or within miles of the subject tract—that is not high-value farmland.

> *(b) Siting the project on non high-value farmland soils present on the subject tract would significantly reduce the project's ability to operate successfully; or*

Response: All EFU land on the subject tract is by statute designated as high-value farmland. Thus, it is not possible to site the Carty Solar Farm generation facility on the subject tract and avoid high-value farmland. Although there are nonarable soils on the tract owned by PGE (Map Codes 9, 53A, 58B and 58C on Figure I-1), there are no substantial areas of Class V-VIII soils that are not now or have not recently been in irrigated cultivation. The proposed Carty Solar Farm generation facility site has some nonarable soils (Map Code 9, corresponding to Class VIII dune land), but that area is a strip of only about 32 acres and is not of sufficient dimensions or overall size for development of the Carty Solar Farm generation facility. Limiting the solar farm facilities to that 32 acres would result in the project having a nominal capacity of about 5 MW, 10 percent of the capacity of the proposed Carty Solar Farm generation facility.

(c) The proposed site is better suited to allow continuation of an existing commercial farm or ranching operation on the subject tract than other possible sites also located on the subject tract, including those comprised of non high-value farmland soils; and

Response: The proposed location of the Carty Solar Farm generation facility has no known history of cultivation, has no water rights for irrigation, and has no infrastructure for irrigation. The Carty Solar Farm generation facility site is almost entirely surrounded by either Carty Reservoir (to the north) or by uncultivated lands subject to a conservation easement under the MSCCAA (to the east, south, and west). In other words, it is physically isolated from other cultivated lands, the nearest of which are approximately 1.7 miles to the west, on the opposite side of Carty Reservoir.

(6) A study area consisting of lands zoned for exclusive farm use located within one mile measured from the center of the proposed project shall be established and:

(a) If fewer than 48 acres of photovoltaic solar power generation facilities have been constructed or received land use approvals and obtained building permits within the study area, no further action is necessary.

(b) When at least 48 acres of photovoltaic solar power generation have been constructed or received land use approvals and obtained building permits, either as a single project or as multiple facilities within the study area, the local government or its designate must find that the photovoltaic solar energy generation facility will not materially alter the stability of the overall land use pattern of the area. The stability of the land use pattern will be materially altered if the overall effect of existing and potential photovoltaic solar energy generation facilities will make it more difficult for the existing farms and ranches in the area to continue operation due to diminished opportunities to expand, purchase or lease farmland or acquire water rights, or will reduce the number of tracts or acreage in farm use in a manner that will destabilize the overall character of the study area.

Response: The area within 1 mile of the center of the proposed Carty Solar Farm generation facility comprises uncultivated lands and the Carty Reservoir. No other solar PV power generation facilities have been constructed or are approved for construction within the required study area. Therefore, no further action is necessary.

i. The project owner shall sign and record in the deed records for the county a document binding the project owner and the project owner's successors in interest, prohibiting them from pursuing a claim for relief or cause of action alleging injury from farming or forest practices as defined in ORS 30.930(2) and (4).

Response: PGE has included in its proposed amendments to the Site Certificate a new condition requiring that before beginning construction of the Carty Solar Farm, the certificate holder must record such a document in the deed records of Morrow County.

j. Nothing in this Section shall prevent the county from requiring a bond or other security from a developer or otherwise imposing on a developer the responsibility for retiring the photovoltaic solar power generation facility.

Response: Retirement of the Carty Solar Farm will be the responsibility of the Site Certificate holder pursuant to Council rules and the conditions of the Site Certificate, pursuant to the Council's Retirement and Financial Assurance standard, OAR 345-022-0050.

MCZO 3.010.M. Yards

In an EFU Zone, the minimum yard setback requirements shall be as follows:

1. The front yard setback from the property line shall be 20 feet for property fronting on a local minor collector or marginal access street ROW, 30 feet from a property line fronting on a major collector ROW, and 80 feet from an arterial ROW unless other provisions for combining accesses are provided and approved by the County.

2. Each side yard shall be a minimum of 20 feet except that on corner lots or parcels the side yard on the street side shall be a minimum of 30 feet.

3. Rear yards shall be a minimum of 25 feet,.

4. Stream Setback. All sewage disposal installations such as outhouses, septic tank and drainfield systems shall be set back from the high-water line or mark along all streams and lakes a minimum of 100 feet, measured at right angles to the high-water line or mark. All structures, buildings, or similar permanent fixtures shall be set back from the high-water line or mark along all streams or lakes a minimum of 100 feet measured at right angles to the high-water line or mark.

Response: Condition 6.22.b of the Site Certificate requires compliance with the yard and stream setback requirements of MCZO 3.010.M. The requirements do not apply to transmission lines. In addition, no sewage disposal installations are proposed as part of this RFA.

MCZO 3.010.N. Transportation Impacts

1. Traffic Impact Analysis (TIA). In addition to the other standards and conditions set forth in this section, a TIA will be required for all projects generating more than 400 passenger car equivalent trips per day. Heavy vehicles – trucks, recreational vehicles and buses – will be defined as 2.2 passenger car

equivalents. A TIA will include: trips generated by the project, trip distribution for the project, identification of intersections for which the project adds 30 or more peak hour passenger car equivalent trips, and level of service assessment, impacts of the project, and, mitigation of the impacts. If the corridor is a State Highway, use ODOT standards. (MC-C-8-98)

Response: Exhibit U includes estimates of potential traffic associated with the Carty Solar Farm. The "400 passenger car equivalent trips per day" might be reached during construction of the Carty Solar Farm, but not during operation. PGE would consult with Morrow County prior to the start of construction, when staging and workforce issues are better know, and will prepare a Traffic Impact Analysis if the 400 trips per day threshold would be exceeded.

In addition, Condition 6.17 requires the certificate holder to implement specified measures to reduce traffic impacts during construction.

K.5.3 Other Zoning Provisions

MCZO 1.050. ZONING PERMIT

Prior to the construction, reconstruction, alteration, or change of use of any structure larger than 100 square feet or use for which a zoning permit is required, a zoning permit for such construction, reconstruction, alteration, or change of use or uses shall be obtained from the Planning Director or authorized agent thereof. A zoning permit shall become void after 1 year unless the development action has commenced. A 12-month extension may be granted when submitted to the Planning Department prior to the expiration of the approval period.

Response: Condition 4.6 of the Site Certificate requires that the certificate holder obtain a Zoning Permit. PGE would comply with that requirement prior to construction of any elements of the Carty Solar Farm.

MCZO 4.165 SITE PLAN REVIEW

Site Plan Review is a non-discretionary or "ministerial" review conducted without a public hearing by the County Planning Director or designee. Site Plan Review is for less complex developments and land uses that do not require site development or conditional use review and approval through a public hearing.

A. Purpose. The purpose of Site Plan Review (ministerial review) is based on clear and objective standards and ensures compliance with the basic development standards of the land use district, such as building setbacks, lot coverage, maximum building height, and similar provisions. Site Plan review also addresses

conformity to floodplain regulations, consistency with the Transportation System Plan, and other standards identified below.

C. Applicability. Site Plan Review shall be required for all land use actions requiring a Zoning Permit as defined in Section 1.050 of this Ordinance. The approval shall lapse, and a new application shall be required, if a building permit has not been issued within one year of Site Review approval, or if development of the site is in violation of the approved plan or other applicable codes.

D. Review Criteria.

1. The lot area shall be adequate to meet the needs of the establishment.

Response: Figure C-1 shows the proposed areas of permanent and temporary disturbance on the project site, which is adequate to accommodate the proposed uses.

2. The proposed land use is permitted by the underlying land use district.

Response: As discussed in Section K.5.1, the transmission facilities proposed for the MG zone are an outright permitted use in the zone, pursuant to MCZO 3.070.A.15. As discussed in Section K.4.2, the buildout of the Grassland Switchyard is a "utility facility necessary for public service" reviewed under MCZO 3.010.D.10.a, the transmission lines in the EFU zone are "associated transmission lines necessary for public service" reviewed under MCZO 3.010.D.10.b, and the Carty Solar Farm generation facility itself is a "photovoltaic solar power generation facility" reviewed under MCZO 3.010.K.3.

3. The land use, building/yard setback, lot area, lot dimension, density, lot coverage, building height and other applicable standards of the underlying land use district and any sub-district(s) are met.

Response: The RFA does not propose the creation or reconfiguration of existing lots. Condition 6.22 of the Site Certificate requires compliance with the setbacks of the MG and EFU zones. Compliance with other applicable standards of the MG and EFU zones is addressed in this exhibit.

4. Development in flood plains shall comply with Section 3.100 Flood Hazard Overlay Zone of the Ordinance.

Response: The development proposed in this RFA is not within a flood plain.

5. Development in hazard areas identified in the Morrow County Comprehensive Plan shall safely accommodate and not exacerbate the hazard and shall not create new hazards.

Response: Morrow County Comprehensive Plan, Natural Hazards Element states: "A natural hazard occurs when a natural hazard impacts people or property and creates adverse conditions with the community." The Natural Hazards Element, and the Morrow County Natural Hazard Mitigation Plan updated in 2016, identify eight natural hazards of concern within some or all of Morrow County: drought; earthquake; flood; landslide; volcano; wildfire; windstorm; and winter storm.

The Natural Hazard Element indicates that only some natural hazards, "such as flooding and landslide hazard areas," can be mitigated through development standards, whereas "for other, more widespread or random hazards such as drought, wildfire, winter storm, or windstorms, effective mitigation must come in the form of public awareness, preparedness and participation."

As indicated in response to MCZO 4.165(D)(4), the development proposed in this RFA is not within a flood plain. Exhibit H of this RFA addresses geologic and soil stability, and Exhibit I addresses soil conditions. Moreover, conditions of the Site Certificate address natural hazards. Condition 6.8 requires the certificate holder to "design, engineer and construct the facility to avoid dangers to human safety presented by non-seismic hazards," including "settlement, landslides, flooding and erosion." Condition 6.7 requires the certificate holder to "design, engineer and construct the facility to avoid danger to human safety presented by seismic hazards affecting the area that are expected to result from all maximum probable seismic events." Other conditions (6.10 and 6.11) require notification to the Oregon Department of Energy, Department of Geology and Mineral Industries and the State Building Codes Division if previously unknown conditions are identified at the energy facility site.

> *6. Off-street parking and loading-unloading facilities shall be provided as required in Section 4.040 and 4.050 of the Morrow County Zoning Ordinance. Safe and convenient pedestrian access to off-street parking areas also shall be provided as applicable.*

Response: Any permanent employees associated with the Carty Solar Farm would be based at Unit 1 of the Carty Generating Station, which is developed with parking facilities.

> *7. County transportation facilities shall be located, designed and constructed in accordance with the design and access standards in the Morrow County Transportation System Plan.*

Response: The facilities proposed in this RFA do not involve or require the development of new county transportation facilities or new access to existing country transportation facilities.

> *8. Site planning, including the siting of structures, roadways and utility easements, shall provide, wherever practicable, for the protection of trees eight*

inch caliper or greater measured four feet from ground level, with the exception of noxious or invasive species, such as Russian olive trees.

Response: Development and operation of the transmission line and Grassland Switchyard buildout are not expected to require the removal of any trees 8 inches or more in diameter. There are scattered juniper trees over 8 inches in diameter on the Carty Solar Farm generation facility, however, that would have to be removed. As part of wildlife habitat mitigation discussed in Exhibit P, PGE will consult with the Oregon Department of Fish and Wildlife (ODFW) regarding mitigation for trees removed.

9. Development shall comply with Section 3.200 Significant Resources Overlay Zone or 3.300 Historic Buildings and Sites protecting inventoried significant natural and historic resources.

Response: There are no inventoried historic buildings or sites on the site. The Significant Resources Overlay Zone applies to certain inventoried resources: aggregate and mineral sites; sensitive bird nesting sites; riparian vegetation/wetlands; big game range; and wildlife habitat zone.

There are no inventoried "Goal 5 significant" aggregate and mineral sites on Site, as shown on the Morrow County Comprehensive Plan Map of Aggregate and Mineral Resources, adopted September 4, 2013.

"Sensitive bird nesting sites" are limited to "bald and golden eagle nest sites and communal roost sites," pursuant to MCZO 3.200.C.2.a. The closest identified nest is a bald eagle nest 0.57 mile west of the Carty Solar Farm generation facility. There are no nests on the site inventoried on Morrow County's 1986 Significant Resource Overlay Map.

Requirements for protection of riparian vegetation and wetlands in MCZO 3.200.C.3 limit road construction, in riparian zones, require setbacks of dwellings and non-water-dependent structures from the high water level of a stream or water body, require that any permanent vegetation removal must retain 75 percent of "all layers or stratas of vegetation." This RFA does not propose any road construction in riparian areas, dwellings or structures within the required 100-foot minimum setback from any stream or water body, or permanent removal of any riparian vegetation.

The site also is not within "big game range." Although MCZO 3.200.C.5 also lists "wildlife habitat zone," there are no use or development restrictions identified.

Exhibits P and Q specifically address impacts to and mitigation for fish and wildlife habitat and threatened and endangered species in accordance with the Council's standards.

10. The applicant shall determine if compliance is required with Oregon Water Resources Department water quantity and/or Oregon Department of Environmental Quality water quality designations.

Response: Water use and wastewater disposal are addressed in Exhibit O and Exhibit V, respectively.

11. The applicant shall determine if previous Code Enforcement violations have been cleared as applicable.

Response: PGE is not aware of any prior Code Enforcement violations.

12. The applicant shall determine the method of disposal for solid waste, with staff providing information to the applicant about recycling opportunities.

Response: Exhibit V addresses recycling and disposal of solid waste. In addition, Condition 6.3 of the Site Certificate requires the implementation of a waste management plan during construction, and Condition 10.22 requires a waste management plan during operation.

13. The applicant shall obtain the necessary access permit through the Public Works Department as required by Morrow County Resolution R-29-2000.

Response: PGE does not anticipate needing new access to county roads. If access is needed, Condition 4.5 of the Site Certificate requires that the certificate holder obtain the permit.

MCZO 6.015. REQUIREMENTS UNDER A STATE ENERGY FACILITY SITE CERTIFICATE

If a holder of a Site Certificate issued by the Oregon Energy Facility Siting Council requests a conditional use permit for an energy facility as outlined under ORS 469.401(3) and pays the requisite fee, the Planning Director shall issue such conditional use permit. The conditional use permit shall incorporate only the standards and conditions in Morrow County's land use and other ordinances as contained in the site certificate. Issuance of the Conditional Use Permit shall be done promptly, not taking more than four weeks once it has been determined that a valid Site Certificate has been issued, the applicant has submitted a complete application and the fee has been received.

Response: This provision implements the requirement of ORS 469.401(3). Condition 4.6 of the Site Certificate requires the certificate holder to obtain all local permits, including a conditional use permit for the portion of the facility on EFU land. That condition will also apply to the proposed Carty Solar Farm.

MCZO 6.020. GENERAL CRITERIA.

In judging whether or not a conditional use proposal shall be approved or denied, the Commission shall weigh the proposal's appropriateness and desirability, or the public convenience or necessity to be served against any adverse conditions that would result from authorizing the particular development at the location proposed and, to approve such use, shall find that the following criteria are either met or can be met by observance of conditions.

A. The proposal will be consistent with the Comprehensive Plan and the objectives of the Zoning Ordinance and other applicable policies and regulations of the County.

Response: The Carty Solar Farm generation facility, as a "photovoltaic solar power generation facility," is a listed conditional use in the EFU zone pursuant to MCZO 3.010.C.24 and therefore is subject to these General Criteria. The Grassland Switchyard buildout and associated transmission lines are listed as permitted uses in the EFU zone under MCZO 3.010.B.24 ("utility facilities necessary for public service, including associated transmission lines") and are not subject to the General Criteria of MCZO 6.020.

The Carty Solar Farm's compliance with applicable zoning regulations and the Morrow County Comprehensive Plan is addressed herein. The design, construction and operation of the Carty Solar Farm would comply with the land use conditions of the Site Certificate, including Condition 4.6 (requirement to obtain all local permits), Condition 6.22 (compliance with setbacks), and Condition 6.23 (limitations on signage).

B. If located within the Urban Growth Boundary of a city, that said city has had an opportunity to review and comment on the subject proposal.

Response: The Carty Solar Farm generation facility would not be located within the Urban Growth Boundary of a city.

C. The proposal will not exceed carrying capacities of natural resources or public facilities.

Response: Exhibits I, J, P, Q, S, and U of this RFA demonstrate that the carrying capacities of natural resources or public facilities would not be exceeded.

MCZO 6.025. RESOURCE ZONE STANDARDS FOR APPROVAL.[10]

A. In the Exclusive Farm Use zone a conditional use may be approved only when the County finds that the use will not:

1. Force a significant change in accepted farm or forest practices on surrounding lands devoted to farm or forest use; or

2. Significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use.

Response: The Carty Solar Farm generation facility site is not adjacent to any lands in forest use or any lands cultivated for farm use. The closest cultivated agricultural land is approximately 1.7 miles west of the western edge of the Carty Solar Farm generation facility site and is separated from the Carty Solar Farm generation facility site by uncultivated land and the Carty Reservoir. That farming is conducted by Threemile Canyon Farms, which has approximately 35,000 acres under cultivation, all using center pivot irrigation. Construction and maintenance of solar panels and associated equipment at the Carty Solar Farm generation facility would not alter or reduce the area under cultivation by Threemile Canyon Farms, would not necessitate relocating any access routes or farm infrastructure, and would not result in changes to the practices for planting, irrigating, fertilizing, or harvesting the circles.

MCZO 6.030. GENERAL CONDITIONS.

In addition to the standards and conditions set forth in a specific zone, this article, and other applicable regulations; in permitting a new conditional use or the alteration of an existing conditional use, the Commission may impose conditions which it finds necessary to avoid a detrimental impact and to otherwise protect the best interests of the surrounding area or the County as a whole. These conditions may include the following:

A. Limiting the manner in which the use is conducted including restricting the time an activity may take place and restraints to minimize such environmental effects as noise, vibration, air pollution, glare and odor.

Response: Noise is addressed in Exhibit X. Noise associated with the Carty Solar Farm would be minimal. The Carty Solar Farm generation facility would not include equipment that would create noticeable vibration, emit air pollution, or create odor. With respect to glare, the Federal Aviation Administration has issued a determination of no hazard, included in this RFA as Appendix E-2 in Exhibit E.

[10] The standards of MCZO 6.025 are identical to ORS 215.296(1) and OAR 660-033-130(5).

B. Establishing a special yard or other open space or lot area or dimension.

Response: This RFA does not propose the creation or reconfiguration of any lots. Condition 6.22 of the Site Certificate requires compliance with the yard and setback requirements of the MG zone and the EFU zone.

C. Limiting the height, size or location of a building or other structure.

Response: This RFA does not propose any buildings. Although the Carty Solar Farm generation facility would occupy approximately 315 acres, as described in Exhibit B, Section B.3, the maximum height of any elements of the Carty Solar Farm generation facility would generally not exceed 10.5 feet. The 34.5-kV transmission line would be mounted on wooden poles approximately 70 feet high, depending on location and span length.

D. Designating the size, number, location and nature of vehicle access points.

1. Where access to a county road is needed, a permit from Morrow County Public Works department is required. Where access to a state highway is needed, a permit from ODOT is required.

Response: No new vehicle access to a county road or a state highway is proposed in this RFA or needed to construct, operate, and retire the facilities proposed.

2. In addition to the other standards and conditions set forth in this section, a Traffic Impact Analysis (TIA) will be required for all projects generating more than 400 passenger car equivalent trips per day. A TIA will include: trips generated by the project, trip distribution for the project, identification of intersections for which the project adds 30 or more peak hour passenger car equivalent trips, and level of service assessment, impacts of the project, and mitigation of the impacts. If the corridor is a State Highway, use ODOT standards. (MC-C-8-98)

Response: Exhibit U includes estimates of potential traffic associated with the Carty Solar Farm. The "400 passenger car equivalent trips per day" might be reached during construction of the Carty Solar Farm, but not during operation. PGE would consult with Morrow County prior to the start of construction, when staging and workforce issues are better known, and will prepare a Traffic Impact Analysis if the 400 trips per day threshold would be exceeded.

In addition, Condition 6.17 requires the certificate holder to implement specified measures to reduce traffic impacts during construction.

E. Increasing the amount of street dedication, roadway width or improvements within the street right-of-way.

1. It is the responsibility of the land owner to provide appropriate access for emergency vehicles at the time of development. (MC-C-8-98)

Response: Tower Road provides access to the site. No new access or street dedication is necessary.

F. Designating the size, location, screening, drainage, surfacing or other improvement of a parking area or loading area.

Response: No new permanent parking or loading areas are proposed in this RFA.

G. Limiting or otherwise designating the number, size, location, height, and lighting of signs.

Response: Condition 6.23 of the Site Certificate limits signage associated with the facility.

H. Limiting the location and intensity of outdoor lighting and requiring its shielding.

Response: Condition 6.14 of the Site Certificate limits exterior nighttime lighting at the facility.

I. Requiring diking, screening, landscaping or another facility to protect adjacent or nearby property and designating standards for its installation and maintenance.

Response: The facilities proposed in this RFA are not in close proximity to uses requiring protection by diking, screening, or landscaping.

J. Designating the size, height, location and materials for a fence.

Response: Condition 7.2 of the Site Certificate requires the certificate holder to enclose the Grassland Switchyard "with appropriate fencing and locked gates." PGE would enclose the expanded Grassland Switchyard and the Carty Solar Farm generation facility site with chain-link security fence; the exact dimensions will be determined during facility design, but it is expected to be approximately 8 feet in height, with an additional foot of barbed wire.

K. Protecting and preserving existing trees, vegetation, water resources, wildlife habitat or other significant natural resources.

Response: Protection of these resources in accordance with Council standards is addressed in Exhibits I, J, P, Q, and V. In addition, the Site Certificate includes extensive conditions for protection of natural resources, including 38 conditions in Section 10 of the Site Certificate.

L. Other conditions necessary to permit the development of the County in conformity with the intent and purpose of this Ordinance and the policies of the Comprehensive Plan.

Response: Additional and modified conditions are proposed in PGE's markup of the Site Certificate, submitted with this RFA.

MCZO 6.040. PERMIT AND IMPROVEMENTS ASSURANCE.

> *The Commission may require an applicant to furnish the County with a performance bond or such other form of assurance that the Commission deems necessary to guarantee development in accordance with the standards established and the conditions attached in granting a conditional use permit.*

Response: This provision does not establish approval standards. Financial assurance for facilities constructed and operated as proposed in this RFA will be in accordance with the Council's Retirement and Financial Assurance standard, OAR 345-022-0050.

MCZO 6.050. STANDARDS GOVERNING CONDITIONAL USES.

> *A conditional use shall comply with the standards of the zone in which it is located and with the standards set forth in this subsection.*

Response: This section of the MCZO provides additional approval standards for certain conditional uses. Although MCZO 6.050.O sets forth standards for "radio, television tower, utility station or substation," those standards do not apply to the Grassland Switchyard buildout. The Grassland Switchyard buildout is a permitted use as a "utility facility necessary for public service" under MCZO 3.010.B.24 and is not subject to conditional use standards.

K.5.4 Comprehensive Plan

Agricultural Lands Element

> *Agricultural Policy 1: It shall be the policy of Morrow County, Oregon, to preserve agricultural lands, to protect agriculture as its main economic enterprise, to balance economic and environmental considerations, to limit non-compatible nonagricultural development, and to maintain a high level of livability in the County.*

Response: The site for the Carty Solar Farm generation facility was selected in part because it is not cultivated, is not known to have been cultivated in the past, has no irrigation water rights, and is isolated from cultivated farmland by Carty Reservoir and conservation lands protected under the MSCCAA. The location, moreover, facilitates interconnection to the existing Grassland to Slatt 500-kV transmission line, avoiding the need for a new high-voltage transmission line to connect the Carty Solar Farm generation facility to the grid. As with the Carty Solar Farm generation facility itself, the five proposed alternative 34.5-kV transmission routes do not impact any cultivated farmland.

Agricultural Policy 4: It shall be the policy of the County to develop and implement comprehensive and definitive criteria for the evaluation of all non-farm developments to ensure that all objectives and policies set forth herein are compiled with to the maximum level possible.

Response: Sections K.5.2 and K.5.3 address the criteria under the MCZO for siting the Carty Solar Farm generation facility, transmission line alternatives, and Grassland Switchyard buildout on land zoned EFU.

Energy Conservation Element

Energy Conservation Policy 3: It shall be the policy of Morrow County, Oregon, to encourage development of solar and wind resources.

Response: This RFA proposes the addition of the Carty Solar Farm, a PV solar energy facility, to the Carty Generating Station, consistent with Energy Conservation Policy 3.

Energy Conservation Policy 9: The County will encourage the development of alternative energy sources in County industries and businesses.

Response: This RFA proposes the addition of the Carty Solar Farm, an alternative energy source, to the Carty Generating Station, consistent with Energy Conservation Policy 9.

Economic Element

Economic Policy 2A: It shall be the policy of the County to maximize the utilization of the local work force as job opportunities increase.

Response: As discussed in Exhibit U, PGE will not know for certain the size of the labor force or the overall timeline for construction until it enters into contracts for the development of the facility. However, a substantial portion of the labor force needed during construction is expected to come from communities within driving distance of the site.

Economic Policy 3A: It shall be the policy of the County to encourage local producers to new markets for local products and to seek out new products that are in demand in the market place and that can be produced locally.

Response: The Carty Solar Farm would provide a renewable source of electric power, diversifying Morrow County's economic mix without removing any land from another productive economic use or adversely affecting the economic productivity of surrounding lands.

Economic Policy 5A: It shall be the policy of the County to utilize appropriate mechanisms in implementing regulations to reduce undesirable impacts from

industrial and commercial developments, including the establishment of buffer zones or other mitigation measures if determined to be necessary.

Response: Condition 6.22 of the Site Certificate incorporates the setback requirements of the Morrow County EFU and MG zones. The Statewide Planning Goal 3 exception in Section K.6.3 discusses the compatibility of the Carty Solar Farm with surrounding land uses.

The Carty Solar Farm generation facility and the Grassland Switchyard buildout area (if needed) would be protected with a perimeter security fence, expected to be a chain-link fence approximately 8 feet tall with an additional foot of barbed wire. No other buffering is needed.

Economic Policy 6C: It shall be the policy of the County to require that development plans be based on the best economic information available, comply with applicable environmental standards, and take into account the effects of the development on the existing economy and available resources, including transportation and work force.

Response: This RFA proposes to add the Carty Solar Farm to the Carty Generating Station. The Carty Solar Farm would utilize uncultivated land to provide a new source of renewable energy. The Carty Solar Farm would be isolated from cultivated land, ensuring that its development would not adversely affect existing agricultural operations in Morrow County. The Carty Solar Farm would utilize existing transportation facilities, as well as the existing Grassland to Slatt 500-kV transmission line.

Compliance with Council standards, as well as conditions of the Site Certificate, will ensure that the project will be protective of the environment and natural resources, including soil, water, fish and wildlife habitat, native plants, and scenic resources.

K.6 DIRECTLY APPLICABLE STATUTES AND ADMINISTRATIVE RULES

K.6.1 Directly Applicable Statutes

ORS 215.274

ORS 215.274 sets forth the standards for "associated transmission lines necessary for public service." These standards are identical to OAR 660-033-0130(16)(b) and the Morrow County EFU standards of MCZO 3.010.D.10.b and are addressed under the Morrow County standards in Section K.5.2.

ORS 215.275

ORS 215.275 sets forth the standards for "utility facilities necessary for public." These standards are identical to OAR 660-033-0130(16)(a) and the Morrow County EFU standards of MCZO 3.010.D.10.a, and are addressed under the Morrow County standards in Section K.5.2.

ORS 215.283(1)(c)

ORS 215.283(1)(c) lists as a permitted use in the EFU zone "utility facilities necessary for public service, including wetland waste treatment systems but not including commercial facilities for the purpose of generating electrical power for public use by sale or transmission towers over 200 feet in height." This use is also authorized by OAR 660-033-0120 and MCZO 3.010.B.24, and is addressed under the Morrow County provision in Section K.5.2.

ORS 215.283(2)(g)

ORS 215.283(2)(g) lists "commercial utility facilities for the purpose of generating power for public use by sale" as a use that "may be established, subject to the approval of the governing body or its designee in any area zoned for exclusive farm use subject to ORS 215.296."

ORS 215.296(1)

The criteria of ORS 215.296(1) are identical to OAR 660-033-130(5) and the resource zone conditional use standards of MCZO 6.025.A, and are addressed under the Morrow County standards in Section K.5.3.

K.6.2 Directly Applicable Administrative Rules

OAR 660-033-130(5)

The criteria of OAR 660-033-130(5) are identical to ORS 215.296(1) and the resource zone conditional use standards of MCZO 6.025.A, and are addressed under the Morrow County standards in Section K.5.3.

OAR 660-033-0130(16)

OAR 660-033-0130(16) sets forth the standards for "utilities facilities necessary for public use" and "associated transmission lines necessary for public use." It incorporates the standards, respectively, of ORS 215.275 and ORS 215.274, which are addressed under the parallel standards of MCZO 3.010.D.10 in Section K.5.2

OAR 660-033-0130(38)

OAR 660-033-0130(38) establishes standards specific to siting of a "photovoltaic solar power generation facility" as defined in OAR 660-033-0130(38)(e). These standards are implemented at the Morrow County level through MCZO 3.010.K.3, which is addressed in Section K.5.2.

K.6.3 Exception to Statewide Planning Goal 3

As discussed above, the Carty Solar Farm generation facility would permanently occupy more than 12 acres of high-value farmland. Pursuant to OAR 660-033-0130(38)(f), therefore, siting of the Carty Solar Farm generation facility requires an exception to Statewide Planning Goal 3. The standards for a goal exception by the Council are set forth in OAR 345-022-0030(4). An exception may be taken on any of three grounds: that the land is "physically developed to the extent that the land is no longer available for uses allowed by the applicable goal"; that the land "is irrevocably committed … to uses not allowed by the applicable goal"; or that "because existing adjacent uses and other relevant factors make uses allowed by the applicable goal impracticable; or what is referred to as a "reasons" exception. The Carty Solar Farm generation facility site is not "physically developed" or "irrevocably committed" within the meaning of the rule. The justification for an exception to Statewide Planning Goal 3 is based on the "reasons" exception under OAR 345-022-0030(4)(c):

(c) The following standards are met:

(A) Reasons justify why the state policy embodied in the applicable goal should not apply;

Response: The Council's standards do not elaborate on what "reasons" are adequate to justify a decision that the state policy embodied in Goal 3 should not apply. However, the concept of a "reasons" exception is derived from Statewide Planning Goal 2 and is clarified in the Land Conservation and Development Commission's rules interpreting the Goal 2 exception process.

OAR 660-004-0022 describes the types of reasons that may or may not be used to justify an exception. Of particular relevance to the proposed Carty Solar Farm generation facility, OAR 660-004-0022(3) provides:

> *(3) Rural Industrial Development: For the siting of industrial development on resource land outside an urban growth boundary, appropriate reasons and facts may include, but are not limited to, the following:*
>
> *(a) The use is significantly dependent upon a unique resource located on agricultural or forest land. Examples of such resources and resource sites include geothermal wells, mineral or aggregate deposits, water reservoirs, natural features, or river or ocean ports;*

(b) The use cannot be located inside an urban growth boundary due to impacts that are hazardous or incompatible in densely populated areas; or

(c) The use would have a significant comparative advantage due to its location (e.g., near existing industrial activity, an energy facility, or products available from other rural activities), which would benefit the county economy and cause only minimal loss of productive resource lands. Reasons for such a decision should include a discussion of the lost resource productivity and values in relation to the county's gain from the industrial use, and the specific transportation and resource advantages that support the decision.

The third factor listed under OAR 660-004-0022(3) is relevant to the reasons for locating a 50 MW PV generating unit at the Carty Generating Station. The location of the Carty Solar Farm generation facility provides the opportunity to site a utility scale renewable energy source in proximity to a switchyard, an existing 500 kV transmission line connecting to the Slatt Substation, and existing generating facilities that already are staffed on a 24-hour basis, ensuring that any maintenance or operational issues at the Carty Solar Farm can be promptly addressed. No topography or structures create the potential for shading any portion of the Carty Solar Farm generation facility.

As discussed above, the Goal 3 implementing rules do not prohibit generating facilities generally, or PV solar generating facilities specifically on EFU land. Rather, a PV solar generating facility is allowed conditionally and is subject to acreage limitations unless a Goal 3 exception is granted. In this case, the limit of 12 acres applies because the site is within the Columbia Valley AVA, making it high-value farmland under ORS 195.300(10)(f)(C). As a practical matter, however, irrigation is typically necessary to produce crops in the arid climate of Morrow County. Threemile Canyon Farms, for example, does not cultivate unirrigated land. Thus, without irrigation rights (either through a new water right or a transfer), the Carty Solar Farm generation facility site while technically containing arable land—and high-value farmland as part of the Columbia Valley AVA—would not be productive cropland.

Development of the Carty Solar Farm generation facility at this site would not remove any land from productive economic use because the site is not cultivated, is not known to have been cultivated in the past, and does not have irrigation water rights. The site could be utilized for commercial agriculture only if new irrigation rights were obtained or existing irrigation rights were transferred from other agricultural land, and if the necessary irrigation infrastructure were constructed.

Although it is theoretically possible to transfer irrigation rights, cultivated lands in the area are irrigated with center pivot irrigation. In order to transfer irrigation rights to the Carty Solar Farm generation facility site, it would be necessary to "dry up" lands in which the investment in center pivot irrigation and irrigation water pipelines have already been made. The result is no net

increase in cultivated acreage, and a substantial economic inefficiency associated with abandoning existing irrigation infrastructure at the "donor" site and establishing new infrastructure at the Carty Solar Farm generation facility site.

Even assuming, moreover, that new irrigation rights can be obtained, the Carty Solar Farm generation facility site would not be a good prospect for the use of such rights due to several factors. First, the potential for cultivation of the Carty Solar Farm generation facility site is limited due to the presence of the adjacent Boardman Ash Disposal Area (see Figure K-1) and the presence of an area of dune land running approximately east to west along the northern portion of the site (see Figure I-1). The Ash Disposal Area and the dune land physically limit the potential dimensions of any center pivot circle. Second, the Carty Solar Farm generation facility site is inherently isolated from other cultivated lands. The site is almost entirely surrounded by Carty Reservoir and the "South Farm Conservation Area" protected by a conservation easement pursuant to the MSCCAA. The nearest irrigation circles are approximately 1.7 miles to the west on the opposite side of Carty Reservoir, and given the existence of the reservoir and the conservation area, irrigation circles would not be developed in closer proximity to the Carty Solar Farm generation facility site. Due to that isolation, infrastructure for bringing irrigation water to the site could not readily and efficiently be extended from existing irrigated lands. The isolation of the site from other cultivated lands would also mean that farm equipment would have to traverse either the conservation area or the Boardman Power Plant site in order to reach the site for purposes of planting, harvesting and tending to any crops.

The proposed location of the Carty Solar Farm generation facility also provides multiple alternative routes for the 34.5 kV transmission line for the generating facility. As discussed in Exhibit B, Section B.3 and as shown on Figure B-3, there are five alternative routes to three alternative points of interconnection for the transmission line. Each route avoids any cultivated agricultural land and would not result in the removal of any land from current economically productive use.

Finally, whereas the isolation of the Carty Solar Farm generation facility from cultivated land limits its own potential for cultivation, it eliminates any potential for impact to farming practices on those cultivated lands. As discussed above in response to the standards of MCZO 6.025 in Section K.5.3, the nearest cultivated land is approximately 1.7 miles west of the western edge of the Carty Solar Farm generation facility site and is separated from the Carty Solar Farm generation facility by uncultivated land and the Carty Reservoir. Construction, operation and maintenance of the Carty Solar Farm would not change accepted farm practices or increase the cost of accepted farm practices on surrounding lands devoted to farm.

(B) The significant environmental, economic, social and energy consequences anticipated as a result of the proposed facility have been identified and adverse impacts will be mitigated in accordance with rules of the Council applicable to the siting of the proposed facility; and

Response: The RFA addresses the environmental, economic, social, and energy-related consequences anticipated as a result of the construction and operation of the Carty Solar Farm. There are no significant impacts that could not be mitigated, as discussed in the relevant exhibits of this RFA. Moreover, the impacts identified do not arise from the specific location of the Carty Solar Farm on EFU land, which is the subject of this Goal 3 exception analysis.

Environmental Consequences: The potential impacts (if any) of the Carty Solar Farm on soils, fish and wildlife, threatened and endangered species, and wetlands have been evaluated in the respective exhibits of this RFA. There are no wetlands, streams or other waterbodies on the 315-acre Carty Solar Farm generation facility site. Washington ground squirrel colonies have not been located in any proposed disturbance areas for the Carty Solar Farm in any recent surveys. Operation of the Carty Solar Farm would not result in any emissions of pollutants. Aside from compliance with permit requirements for construction of such a facility (for example, National Pollutant Discharge Elimination System 1200-C permit), the only impacts that would require mitigation are: (1) mitigation measures identified in Exhibit P for temporary and permanent impacts to ODFW Habitat Category 3 and Habitat Category 4 habitat; and (2) implementation of the certificate holder's Revegetation and Noxious Weed Control Plan (Appendix P-4).

Economic Consequences: The proposed Carty Solar Farm would provide a reliable source of electricity with no fuel cost and no associated emissions. The Carty Solar Farm would be expected to provide electricity to the region for at least 30 years. As discussed under MCZO 6.025 in Section K.5.3, the Carty Solar Farm would not adversely affect any farming operations in the general area. There are no significant adverse economic consequences of constructing and operating the Carty Solar Farm on the site.

Social Consequences: Social consequences are discussed in Exhibit S, Exhibit T, Exhibit U, and Exhibit V. There are no known historic, cultural, or archaeological resources on the Carty Solar Farm site. All construction work on the site would be performed in accordance with the certificate holder's Inadvertent Discovery Plan, in the event that such resources are discovered during construction on the site. The Site Certificate incorporates conditions to address and mitigate potential transportation system impacts during construction.[11] There are no other significant social consequences that would require mitigation.

Energy Consequences: The proposed Carty Solar Farm would provide 50 MW of renewable electric generating capacity with no associated air emissions and no fuel cost. The energy consequences of constructing and operating the Carty Solar Farm are positive.

(C) The proposed facility is compatible with other adjacent uses or will be made compatible through measures designed to reduce adverse impacts.

[11] Site Certificate Conditions 6.17 through 6.19.

Response: The existing uses adjacent to the proposed Carty Solar Farm are the Carty Reservoir; the Boardman Plant, Carty Generating Station Unit 1; the Boardman Ash Disposal Area; Threemile Canyon Farms; the Boardman Conservation Area (South Farm Conservation Area); and NWSTF Boardman.

Carty Reservoir: The Carty Reservoir provides water for the Boardman Plant and Carty Generating Station. The Carty Solar Farm generation facility would be located south of the Carty Reservoir. The Carty Solar Farm would not interfere with any of the reservoir infrastructure, nor would the operation of the Carty Reservoir affect the ongoing operation or maintenance of the proposed Carty Solar Farm.

Boardman Plant and Carty Generating Station Unit 1: The Boardman Plant is a coal-fired power plant located on land zoned for General Industrial use on the north side of the Carty Reservoir. Carty Generating Station Unit 1 is a combined cycle natural gas-fired generating facility. These facilities are separated from the Carty Solar Farm generation facility site by the Carty Reservoir. The Carty Solar Farm would produce no emissions or significant noise and would not affect the operations of the Boardman Plant or Carty Generating Station Unit 1. The location of those facilities on the north side of the Carty Reservoir ensures that they would not affect the operations of the Carty Solar Farm generation facility. Further, the uses are compatible in that the Boardman Plant and the Carty Generating Station gas-fired unit facilitate the interconnection of the 34.5 kV transmission line for the Carty Solar Farm, as discussed in Exhibit B, Section B.3.

Boardman Ash Disposal Area: The Boardman Ash Disposal Area, operated under the Site Certification Agreement for the Boardman Plant, is located adjacent to the northeast side of the proposed Carty Solar Farm generation facility. The ash disposal area would be permanently closed and revegetated after the Boardman Plant ceases burning coal as fuel; use of coal as fuel at the Boardman Plant would cease no later than December 31, 2020. The Carty Solar Farm generation facility would involve no emissions, activities, or other impacts that could impact the disposal of ash or the ability of PGE to close the ash disposal area.

Threemile Canyon Farms: As already discussed, Threemile Canyon Farms cultivates extensive areas using center pivot irrigation. The nearest center pivot circles are approximately 1.7 miles west of the western edge of the Carty Solar Farm generation facility site and are separated from the Carty Solar Farm generation facility by uncultivated land and the Carty Reservoir. The Carty Solar Farm generation facility would not affect infrastructure, including road access, to or within Threemile Canyon Farms and would not affect the ability to plant, irrigate, fertilize or harvest the center pivot circles in question.

Boardman Conservation Area: TNC manages conservation areas, including the Boardman Conservation Area (also known as the "South Farm Conservation Area"), under the terms of an ODFW conservation easement, a sublease with Threemile Canyon Farms, and a management plan approved by the United States Fish and Wildlife Service under the MSCCAA. TNC's

management activities are designed to maintain and improve habitat of four species in particular: Washington ground squirrel, ferruginous hawk, loggerhead shrike, and sage sparrow. The proposed Carty Solar Farm is not part of the lands managed by TNC. The construction and operation of the Carty Solar Farm would not interfere with TNC's ability to manage vegetation or to control soil disturbance, hunting, or similar activities within the conservation area for the benefit of the four identified species. The certificate holder's implementation of its Revegetation and Noxious Weed Control Plan (Appendix P-4)would protect against the possible introduction of noxious weed species incompatible with TNC's conservation efforts.

Naval Weapons Systems Training Facility Boardman: NWSTF Boardman, commonly referred to as the Boardman Bombing Range, is located more than a mile east of the proposed Carty Solar Farm generation facility. NWSTF Boardman comprises more than 47,000 acres of land owned by the United States. Training activities conducted at NWSTF Boardman provide Navy and Oregon National Guard personnel with a wide range of training opportunities, including conducting air combat maneuvers, conducting electronic combat training, and conducting bombing and missile exercises (nonexplosive), in addition to live-fire training activities against ground targets. The Carty Solar Farm generation facility is physically separated from NWSTF Boardman by uncultivated land. NWSTF Boardman activities would not affect the ability to construct, operate, or maintain a PV solar generating facility on the Carty Solar Farm generation facility site. The Carty Solar Farm could not create any physical obstruction to the use of NWSTF Boardman. In addition, the Federal Aviation Administration has issued a determination of no hazard, included in this RFA as Appendix E-2.

Summary

As noted in the ASC, the location of the Carty Solar Farm generation facility offers significant comparative advantages over other potential locations for energy generating facilities. Those advantages include the ability to interconnect to the existing 500-kV Grassland to Slatt transmission line, the absence of any history of cultivation or irrigation rights, the physical limitation created by the Ash Disposal Pile and dune lands extending across the site, the isolation of the Carty Solar Farm generation facility site from any incompatible uses, and the difficulty of obtaining or extending irrigation water to the site and of accessing the site for planting, harvesting and tending crops. The development of the Carty Solar Farm would provide renewable energy without lost productivity to resource lands.

K.7 FEDERAL LAND MANAGEMENT PLANS

OAR 345-021-0010(1)(k)(D)

If the proposed facility will be located on federal land:

(i) Identify the applicable land management plan adopted by the federal agency with jurisdiction over the federal land.

(ii) Explain any differences between state or local land use requirements and federal land management requirements.

(iii) Describe how the proposed facility complies with the applicable federal land management plan.

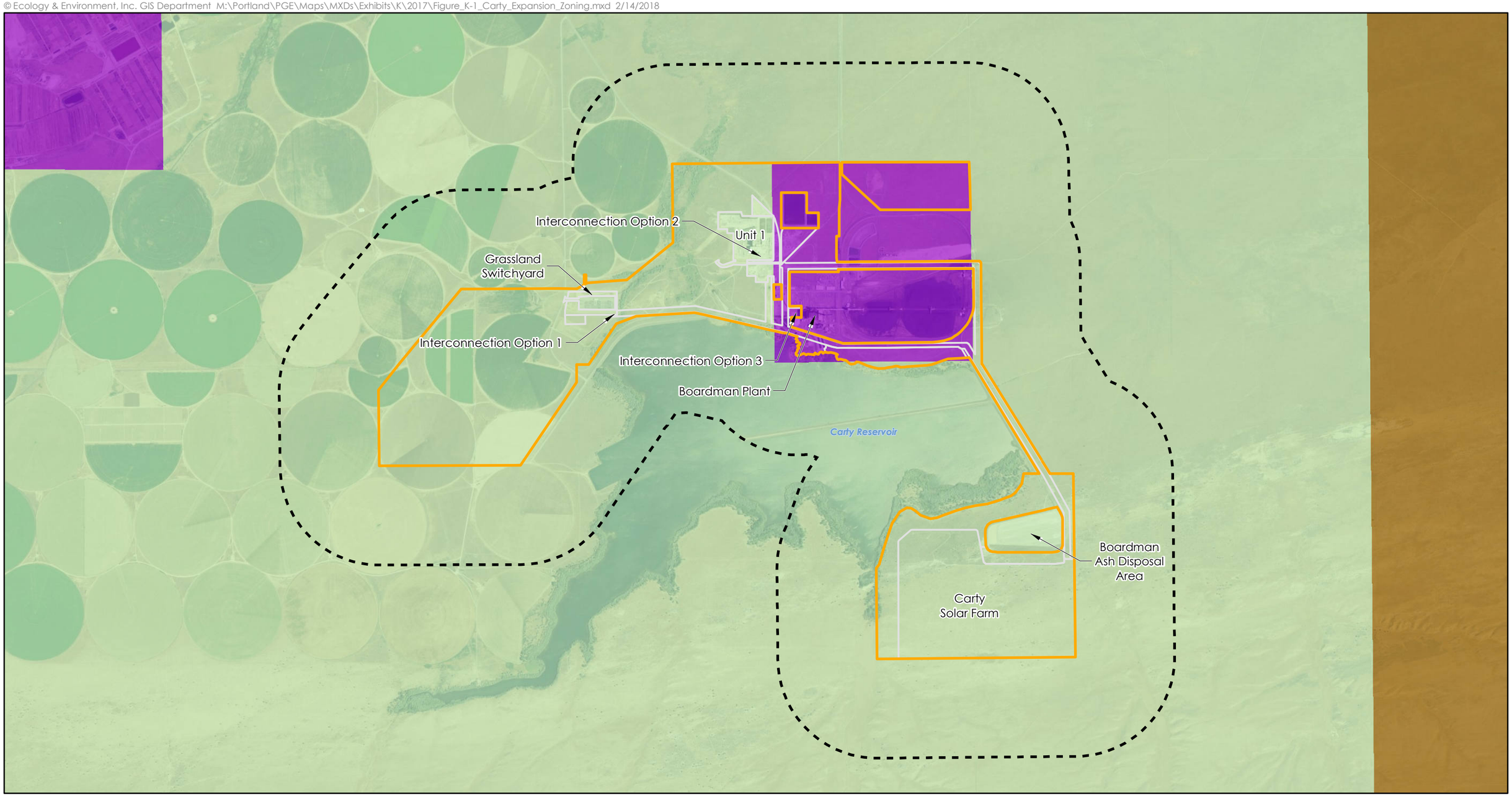
(iv) Describe any federal land use approvals required for the proposed facility and the status of application for each required federal land use approval.

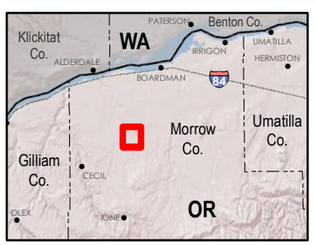
(v) Provide an estimate of time for issuance of federal land use approvals.

(vi) If federal law or the land management plan conflicts with any applicable state or local land use requirements, explain the differences in the conflicting requirements, state whether the applicant requests Council waiver of the land use standard described under paragraph (B) or (C) of this subsection and explain the basis for a waiver.

Response: The facilities proposed in this RFA would not be located on lands under federal land use jurisdiction.

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- Carty Generating Station Amended Site Boundary
- 0.5-Mile Analysis Area
- Existing or Proposed Project Disturbance Areas

Morrow County Comprehensive Plan / Zoning Designation*

- Exclusive Farm Use
- General Industrial
- Military Use

*Comprehensive plan designation is same as zoning designation Morrow County Zoning data detail is at 1:24,000 scale.
Sources: Morrow County; Oregon Geospatial Enterprise Office

N

1:30,000

0 0.25 0.5 Miles

Credits: Copyright:© 2014 Esri
Esri, USDA Farm Service Agency

Figure K-1
Morrow County Comprehensive Plan /Zoning Designation

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

EXHIBIT L – Request for Amendment No. 1

PROTECTED AREAS

OAR 345-021-0010(1)(l)

TABLE OF CONTENTS

L.1 SUMMARY L-1

L.2 LIST OF PROTECTED AREAS L-1

L.3 LOCATION OF PROTECTED AREAS L-2

L.4 POTENTIAL IMPACTS L-2

L.5 REFERENCES L-4

TABLES

Table L-1 Protected Areas within the Analysis Area L-2

FIGURES

Figure L-1 Protected Areas

L.1 SUMMARY

OAR 345-021-0010 (1)(l) *Information about the proposed facility's impact on protected areas, providing evidence to support a finding by the Council as required by OAR 345-022-0040:*

Response: This exhibit provides the information required by Oregon Administrative Rules 345-021-0010(1)(l) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station (RFA). This exhibit evaluates the potential impacts of the Carty Solar Farm (as defined in Exhibit B) on protected areas. The analysis area for protected areas includes the area within the amended Site Boundary and 20 miles from the amended Site Boundary.

L.2 LIST OF PROTECTED AREAS

OAR 345-021-0010(1)(l)(A) *A list of the protected areas within the analysis area showing the distance and direction from the proposed facility and the basis for protection by reference to a specific subsection under OAR 345-022-0040(1).*

Response: Table L-1 lists all of the protected areas, as defined under OAR 345-022-0040(1)(l), within the 20-mile analysis area, and includes the distance and direction to each from the nearest point of the amended Site Boundary. The list was determined by reviewing the following resources:

- National Park Service (n.d.[a], n.d.[b])
- Bureau of Land Management (n.d.[a], n.d.[b])
- U.S. Department of Agriculture Forest Service (n.d.[a], n.d.[b])
- The Wilderness Institute (2017)
- U.S. Fish and Wildlife Service (n.d.[a], n.d.[b], 2015)
- Oregon Department of Fish and Wildlife (2016)
- Washington Department of Fish and Wildlife (2018a, 2018b)
- Oregon Parks and Recreation Department (n.d., 2017)
- Washington State Parks (n.d.)
- Benton County Parks (n.d.)
- National Wild and Scenic Rivers System (n.d.[a], n.d.[b])
- Oregon State University, College of Agricultural Sciences (2017)
- Oregon State University, College of Forestry (2011, 2017)
- Morrow County (2013)
- Gilliam County (2017)

Table L-1 Protected Areas within the Analysis Area

Name	Distance and Direction from the Amended Site Boundary	Basis for Protection
Umatilla National Wildlife Refuge	9.1 miles north	OAR 345-022-0040(l)(d)
Irrigon Hatchery	19.2 miles northeast	OAR 345-022-0040(l)(f)
Umatilla Fish Hatchery	19.2 miles northeast	OAR 345-022-0040(l)(f)
Horn Butte Area of Critical Environmental Concern	7.1 miles west	OAR 345-022-0040(l)(o)
Boardman Research Natural Area	2.7 miles east	OAR 345-022-0040(l)(o)
Lindsay Prairie Preserve	7.8 miles southeast	OAR 345-022-0040(l)(o)
Irrigon Wildlife Area	18.4 miles northeast	OAR 345-022-0040(l)(p)
Willow Creek Wildlife Area	10.0 miles northwest	OAR 345-022-0040(l)(p)
Coyote Springs Wildlife Area	11.7 miles northeast	OAR 345-022-0040(l)(p)

L.3 LOCATION OF PROTECTED AREAS

OAR 345-021-0010(1)(l)(B) *A map showing the location of the proposed facility in relation to the protected areas listed in OAR 345-022-0040 located within the analysis area.*

Response: Figure L-1 depicts the protected areas listed in Table L-1 in relation to the project and the amended Site Boundary.

L.4 POTENTIAL IMPACTS

OAR 345-021-0010(1)(l)(C) *A description of significant potential impacts of the proposed facility, if any, on the protected areas.*

Response: Construction and operation of the Carty Generating Station, as amended, would not result in substantial impacts on protected areas. The closest protected area—the Boardman Research Natural Area (see Table L-1 and Figure L-1)—is approximately 2.7 miles east of the amended Site Boundary. Other protected areas are at least 7.1 miles away. Existing conditions

and potential project-related noise, visual, traffic, water use, and wastewater disposal impacts on protected areas are described below.

Noise

The Boardman Power Plant is the main existing noise source at or near the Project. Portland General Electric Company (PGE) expects construction activities proposed in this RFA for the Carty Solar Farm and supporting facilities to be similar to those described in the Application for Site Certificate (i.e., less than 50 A-weighted decibels [dBA] at a distance of 5 miles), and to be in compliance with the most restrictive OAR 340-35-035 "Table 8" daytime or nighttime limit of 50 dBA. Note that noises from construction activities are exempt from the rules of OAR 340-035-0035(1) by OAR 340-035-0035(5). The operational noise level associated with the Carty Solar Farm would be less than 20 dBA at the closest noise-sensitive receiver, which is more than 2 miles away (see Exhibit X). PGE does not anticipate that operational noisewould influence the sound level at the Boardman Research Natural Area or other protected areas. For these reasons, PGE does not expect construction and operational noise to have a significant impact on protected areas within the analysis area.

Visual

The most prominent feature near the project that is visible at a distance is the 650-foot-tall Boardman Plant stack, followed by the 200-foot-tall stack associated with Unit 1, which PGE evaluated in the Application for Site Certificate. The new and modified facilities associated with this RFA would be substantially shorter than these stacks. The solar arrays would be below 9 feet tall and electrical inverters would be below 11 feet tall. The solar farm interconnection transmission line would be constructed using approximately 70-foot-tall wooden poles. Therefore, PGE does not expect that construction and operation of the project, as amended, would significantly alter the view from any protected areas within the analysis area.

Traffic

Tower Road, which connects the project to Interstate 84 in the north, provides the only paved access to the project. Existing traffic levels on Tower Road are primarily associated with workers commuting to and from the Boardman Power Plant, Carty Generating Station (i.e., Unit 1), and a large agricultural operation (Threemile Canyon Farms). PGE expects an average of about 50 to 60 workers per day during the anticipated nine-month construction period for the Carty Solar Farm, with a peak number of workers ranging between 100 and 130 workers per day during the second half of the construction period. Assuming an average of 1.25 workers per vehicle (carpooling factor), the anticipated worker vehicle trips generated by the project will be a peak of 104 one-way trips during both the AM and PM peak hours. PGE expects a peak of six two-way trips per day by dump trucks during the first few weeks of construction, and a peak of 28 two-way trips per day by large and small trucks for delivery of modules, trackers, and cabling. These estimates are below the peak flow observed during construction of Unit 1, during which no substantial traffic-related impacts on sensitive resources were observed. PGE expects

approximately one two-way trip per day by maintenance crews during operations of the solar farm, which is lower than both the Boardman Plant and Unit 1.

The nearest protected area—the Boardman Research Natural Area—can be accessed from the City of Boardman via Bombing Range Road, approximately 9 miles east of Tower Road on Interstate 84. Other protected areas within the analysis area are accessible via Interstate 84, State Route 74, or other paved roads. Based on the distance of the protected areas from the routes that personnel would use during construction and operation of the amended facilities, PGE expects no significant impacts on protected areas would occur.

Water Use and Wastewater Disposal

The project would not use water from any protected areas, nor would it dispose of any wastewater in or near protected areas, or in a manner that could lead to drainage into protected areas. Therefore, PGE expects the project would have no impacts on protected areas as a result of water use or wastewater disposal.

L.5 REFERENCES

Benton County. n.d. Our Parks. http://www.co.benton.wa.us/pview.aspx?id=860&catID=0. Accessed January 12, 2018.

Bureau of Land Management. n.d.[a]. Cascade-Siskiyou National Monument. https://www.blm.gov/programs/national-conservation-lands/national-monuments/oregon-washington/cascade-siskiyou. Accessed December 5, 2017.

_____. n.d.[b]. Current List of ACEC. https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec. Accessed December 5, 2017.

Gilliam County. 2017. Gilliam County Comprehensive Plan and Land Development Ordinance. http://www.co.gilliam.or.us/zoning.html. Accessed December 7, 2017.

Morrow County. 2013. Morrow County, Oregon, Comprehensive Plan, Acknowledged by the LCDC January 30, 1986; Natural Resource Element amended in 2013. http://www.co.morrow.or.us/planning/page/comprehensive-plan. Accessed December 7, 2017.

National Park Service. n.d.[a]. Oregon Parks. https://www.nps.gov/state/or/index.htm. Accessed December 5, 2017.

_____. n.d.[b]. Washington Parks. https://www.nps.gov/state/wa/index.htm. Accessed December 5, 2017.

National Wild and Scenic Rivers System. n.d.[a]. Oregon. https://www.rivers.gov/oregon.php. Accessed December 5, 2017.

_____. n.d.[b]. Washington. https://www.rivers.gov/washington.php. Accessed December 5, 2017.

Oregon Department of Fish and Wildlife. 2016. The ODFW Visitors' Guide: Fish Hatcheries and Wildlife Management Areas. Las updated November 28, 2016. http://www.dfw.state.or.us/resources/visitors/index.asp#east. Accessed December 5, 2017.

Oregon Parks and Recreation Department. 2017. Find a Park. http://oregonstateparks.org/index.cfm?do=visit.dsp_find. Accessed December 5, 2017.

_____. n.d. Oregon Scenic Waterways. http://www.oregon.gov/oprd/NATRES/scenicwaterways/PublishingImages/ScenicWaterwaysMap_New.pdf. Accessed December 5, 2017.

Oregon State University, College of Agricultural Sciences. 2017. OAES Branch Stations. https://agsci.oregonstate.edu/research/oregon-agricultural-experiment-station/oaes-branch-stations. Accessed December 5, 2017.

Oregon State University, College of Forestry. 2011. OSU Research Forests. http://cf.forestry.oregonstate.edu/forests. Accessed December 5, 2017.

_____. 2017. Oregon's Natural Areas. Institute for Natural Resources, Oregon Biodiversity Information Center. http://inr.oregonstate.edu/sites/inr.oregonstate.edu/files/2010-rna.pdf. Accessed December 5, 2017.

U.S. Department of Agriculture Forest Service. n.d.[a]. Newberry National Volcanic Monument – Deschutes NF. Deschutes National Forest. https://www.fs.usda.gov/recarea/deschutes/recarea/?recid=66159. Accessed December 5, 2017.

_____. n.d.[b]. Pacific Northwest Forest Areas. Pacific Northwest Region. https://www.fs.usda.gov/detail/r6/home/?cid=fsbdev2_026675#nra. Accessed December 5, 2017.

U.S. Fish and Wildlife Service. n.d.[a]. National Wildlife Refuge Locator Map: Oregon. https://www.fws.gov/refuges/refugelocatormaps/oregon.html. December 5, 2017.

_____. n.d.[b]. National Wildlife Refuge Locator Map: Washington. Fish and Aquatic Conservation. https://www.fws.gov/refuges/refugelocatormaps/washington.html. December 5, 2017.

_____. 2015. National Fish Hatchery System: Oregon. Last updated September 14, 2015. https://www.fws.gov/Fisheries/nfhs/facilities/oregon.html. Accessed December 5, 2017.

Washington Department of Fish and Wildlife. 2018a. Introducing Washington's Wildlife Areas. https://wdfw.wa.gov/lands/wildlife_areas/. Accessed January 12, 2018.

_____. 2018b. Hatchery Facilities. https://wdfw.wa.gov/hatcheries/facilities.php. Accessed January 12, 2018.

Washington State Parks. n.d. South Central Region. http://parks.state.wa.us/846/South-Central-Region. Accessed December 5, 2017.

The Wilderness Institute. 2017. Wilderness Map. The University of Montana, College of Forestry and Conservation. http://www.wilderness.net/map.cfm. December 5, 2017.

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Bickleton
Washington
Irrigon and Umatilla Hatcheries
Irrigon Wildlife Area
Paterson
Plymouth
Umatilla
Irrigon
Alderdale
Boardman
Hermiston
Columbia River
Coyote Springs Wildlife Area
Stanfield
Goodnoe Hills
Roosevelt
Willow Creek Wildlife Area
Arlington
Echo
Umatilla County
Morrow County
Oregon
Ione
Lexington
Heppner
Gilliam County
Morrow County
Eightmile Canyon
Willow Creek
Sixmile Canyon
Simmile Canyon

27 221 14 730 37 82 84 30 207 19 74 206 395



- Amended Site Boundary
- 20 mile Analysis Area
- Boardman Research Natural Area (RNA)
- Lindsay Prairie Preserve
- Umatilla National Wildlife Refuge (NWR)
- Horn Butte Area of Critical Environmental Concern (ACEC)
- State Wildlife and Management Areas

N

1:350,000

0 2 4 6 8 Miles

Credits: Copyright:© 2014 Esri

Figure L-1
Protected Areas
(Protected Areas per OAR 345-022-0040(i))

Request for Amendment No. 1
Carty Generating Station Site Certificate
Portland General Electric Company
February 2018

EXHIBIT M – Request for Amendment No. 1

FINANCIAL CAPABILITY
OAR 345-021-0010(1)(m)

TABLE OF CONTENTS

M.1 INTRODUCTION..... M-1

M.2 OPINION OF LEGAL COUNSEL..... M-1

M.3 TYPE AND AMOUNT OF FINANCIAL INSTRUMENT..... M-1

M.4 EVIDENCE OF REASONABLE LIKELIHOOD OF OBTAINING SECURITY..... M-2

APPENDICES

Appendix M-1 Legal Opinion on Authority to Construct

Appendix M-2 Letter from JP Morgan Chase Bank

M.1 INTRODUCTION

OAR 345-021-0010(1) (m) *Information about the applicant's financial capability, providing evidence to support a finding by the Council as required by OAR 345-022-0050(2). Nothing in this subsection shall require the disclosure of information or records protected from public disclosure by any provision of state or federal law.*

Response: This exhibit provides the information required by Oregon Administrative Rules (OAR) 345-021-0010(1)(m) in support of the Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station. Under OAR 345-022-0050(2), the Energy Facility Siting Council (Council) must find that the applicant has a reasonable likelihood of obtaining a bond or letter of credit in a form and amount satisfactory to the Council to restore the site to a useful, non-hazardous condition. This exhibit provides the information necessary for the Council to make this determination.

M.2 OPINION OF LEGAL COUNSEL

OAR 345-021-0010(1)(m)(A) *An opinion or opinions from legal counsel stating that, to counsel's best knowledge, the applicant has the legal authority to construct and operate the facility without violating its bond indenture provisions, articles of incorporation, common stock covenants, or similar agreements.*

Response: Appendix M-1 is an opinion from Portland General Electric Company's (PGE's) legal counsel, conforming to the requirements of this rule.

M.3 TYPE AND AMOUNT OF FINANCIAL INSTRUMENT

OAR 345-021-0010(l) (m) (B) *The type and amount of the applicant's proposed bond or letter of credit to meet the requirements of OAR 345-022-0050.*

Response: Portland General Electric Company hereby commits to submit, prior to the commencement of Carty Solar Farm construction, to the State of Oregon, through the Council, a bond or letter of credit in a form satisfactory to the Council, in an amount required by the Council of up to $12,000,000, which security shall ensure that sufficient funds will be available to adequately retire the facility and restore the site to a useful, non-hazardous condition. The amount of the bond or letter of credit will only reflect the portion of the facility already constructed (i.e., Unit 1) or proposed for impending commencement of construction (i.e., Carty Solar Farm).

M.4 EVIDENCE OF REASONABLE LIKELIHOOD OF OBTAINING SECURITY

OAR 345-021-0010(1)(m)(C) *Evidence that the applicant has a reasonable likelihood of obtaining the proposed bond or letter of credit in the amount proposed in OAR 345-021-0010(1)(B), before beginning construction of the facility.*

Response: Appendix M-2 is a letter confirming JP Morgan Chase Bank's willingness to furnish or arrange a letter of credit.

Appendix M-1
Legal Opinion on Authority to Construct

Portland General Electric Company
Legal Department
121 SW Salmon Street • 1WTC1715 • Portland, Oregon 97204
503-464-8860 • Facsimile 503-464-2222

Lisa A. Kaner
Vice President
General Counsel &
Corporate Compliance Officer

February 14, 2018

Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

Re: Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station

Ladies and Gentlemen:

I am Vice President and General Counsel of Portland General Electric Company ("Applicant"). In such capacity, I have reviewed or supervised the review of bond indenture provisions, articles of incorporation, common stock covenants, and similar agreements.

Based on the foregoing, I am of the opinion, based upon my best knowledge, that subject to Applicant meeting all applicable federal, state and local laws (including all rules and regulations promulgated pursuant thereto), Applicant has the legal authority without violating its bond indenture provisions, Articles of Incorporation, common stock covenants or similar agreements, to construct and operate all components of the Carty Generating Station facility (the "Facility") that Applicant proposes in its Request for Amendment No. 1 of the Site Certificate for the Carty Generating Station filed with the Oregon Energy Facility Siting Counsel, which includes this letter.

The foregoing opinion is rendered pursuant to OAR 345-021-0010(1)(m)(A) as to Applicant's legal authority to construct and operate the Facility. I express no opinion as to the applicability of any federal, state and local laws (including all rules and regulations promulgated thereto) to such construction and operation or as the effects of the foregoing laws on such construction and operation.

I am admitted to the Bar of the State of Oregon. In rendering the opinion set forth above, I do not express any opinion concerning the laws of any jurisdiction other than the State of Oregon and Federal law, as applicable.

Sincerely,

Lisa Kaner
Vice President and General Counsel

Appendix M-2
Letter from JP Morgan Chase Bank

J.P.Morgan

Nancy R. Barwig
Credit Risk Director

January 31, 2018

Mr. Jaisen Mody
Portland General Electric Company
121 SW Salmon Street
Portland, OR 97204

Re: Carty Generating Station

Att: EFSC Financial Assurance Requirements for proposed Carty Generating Station

JPMorgan Chase Bank, N.A. has a long standing business relationship with Portland General Electric Company ("PGE" or the "Company"), and has acted as a lead underwriter for PGE in the placement of senior unsecured debt and has participated as a direct lender to PGE under various committed credit agreements.

PGE has always managed its credit relationship with JPMorgan Chase Bank, N.A. in a satisfactory manner and is considered to be a client in good standing. Based upon the Company's current credit profile, and subject to acceptable pricing, terms and requisite internal and credit approvals, J.P. Morgan would be willing to furnish or arrange a letter of credit in an amount up to $12 million for a period not to exceed three years and six months for the purpose of ensuring the Company's obligation that the site of the Carty Generating Station can be restored to a useful non-hazardous condition. The Bank does not hereby represent that a commitment can be or will be delivered. Any commitment or offer to commit by the Bank cannot occur prior to credit approval, which has not yet been obtained.

The information in this letter is provided as an accommodation to the inquirer as of the date hereof. This report and any information provided in connection therewith are furnished on the condition that no liability or responsibility whatsoever in connection herewith shall attach to JPMorgan Chase Bank, N.A. or any of its officers, employees or agents, that this report makes no representation regarding the general condition of the subject, its management, or its future ability to meet its obligations, and that any information provided herein is subject to change without notice.

Sincerely,

Nancy R. Barwig

Corporate Client Banking & Specialized Industries, Power and Utilities, 10 South Dearborn, 9th Floor, Mail Code: IL1-0364, Chicago, IL 60603-2003 Telephone: 312-732-1838 Facsimile: 312-732-1762 email: nancy.r.barwig@jpmorgan.com

JPMorgan Chase Bank, N.A.