PERAPPDOC1

Application for Site Certificate Perennial Wind Chaser Station

October 2014

Submitted to
Oregon Department of Energy

By
Perennial-WindChaser LLC

Application for Site Certificate for the Perennial Wind Chaser Station

Submitted to:

Oregon Department of Energy

October 2014

Prepared by:

PERENNIAL-WINDCHASER LLC
300 Madison Ave.
New York, NY 10017

RTP ENVIRONMENTAL ASSOCIATES, INC.
2040 Torrey Pines Road
La Jolla, CA 92037

ECOLOGY AND ENVIRONMENT, INC.
333 SW 5th Ave.
Portland, OR 14086

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AADT	Average Annual Daily Traffic
AC	alternating current
ACDP	Air Contaminant Discharge Permit
ACSR	aluminum conductor, steel reinforced
AINW	Archaeological Investigations Northwest, Inc.
ASC	Application for Site Certificate
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BPA	Bonneville Power Authority
Btu	British thermal units
CCS	Cowlitz Clean Sweep, Inc.
CESQ	Conditionally Exempt Small Quantity
CFR	Code of Federal Regulations
cfs	cubic feet per second
CNG	Cascade Natural Gas Corporation
CO	carbon monoxide
CO_2	carbon dioxide
Cost Guide	Oregon Department of Energy's *Site Restoration Cost Estimating Guide*
Council	Oregon Energy Facility Siting Council
CSZ	Cascadia Subduction Zone
CTG	combustion turbine generator
CWM	Chemical Waste Management
dB	decibels
dBA	A-weighted decibels
dBuv/m	decibels relative to 1 microvolt per meter
DCP	dynamic cone penetrometer
DEQ	Oregon Department of Environmental Quality
DEQ	Oregon Department of Environmental Quality
DLCD	Oregon Department of Land Conservation and Development
DOGAMI	Oregon Department of Geology and Mineral Industries
DSL	Oregon Department of State Lands

E & E	Ecology & Environment, Inc.
EFU	Exclusive Farm Use
EMF	electric and magnetic fields
EPC	engineering, procurement, and construction
ESC	erosion and sediment control
ESU	Evolutionarily Significant Unit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
GDP	gross domestic product
GE	General Electric
GMPE	ground motion prediction equations
gpd	gallons per day
gpm	gallons per minute
GPS	global positioning system
GSU	generator step-up
GTN	Gas Transmission Northwest
HERO	high efficiency reverse osmosis
HGC	Hermiston Generating Company
HGP	Hermiston Generating Plant
HHV	higher heating value
HPC	high pressure compressor
I-82	Interstate Highway 82
I-84	Interstate Highway 84
IBC	International Building Code
ISO	International Organization for Standardization
kg/km^2-month	kilograms per square kilometer per month
km	kilometer
KOP	key observation point
kV	kilovolt
kV/m	kilovolts per meter
kW	kilowatts
L_{50}	sound level exceeded 50 percent of the time
lbs	pounds
lbs CO_2/kWh	pounds of carbon dioxide per kilowatt hour
LCC	Land Capability Classes

LCDC	Oregon Land Conservation and Development Commission
LCCD	Oregon Department of Land Conservation and Development
LI	Light Industrial
LPC	low pressure compressor
LUBA	Oregon Land Use Board of Appeals
MCE	Maximum Credible Earthquake
MConE	Maximum Considered Earthquake
MG	general industrial use
mG	milligauss
mgd	million gallons per day
MP	mile post
MPE	maximum probable earthquake
MW	megawatts
NC	Neighborhood Commercial
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
ODOE	Oregon Department of Energy
ODOT	Oregon Department of Transportation
ODOT Rail	Oregon Department of Transportation Rail
OHWM	ordinary high water mark
OR GAP	Oregon National Gap Analysis Program
ORBIC	Oregon Biodiversity Information Center
ORRCO	Oil Re-Refining Company, Inc.
ORS	Oregon Revised Statutes
Perennial	Perennial-WindChaser LLC
PGA	peak ground acceleration
Port	Port of Umatilla

PPH	Perennial Power Holdings, Inc.
Procedure	Waste Management Procedure
Project	Perennial Wind Chaser Station project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gage
R1	Single Family Residential
R2	Multi-Family Residential
RMP	Risk Management Plan
RO	reverse osmosis
ROW	rights-of-way
RTC	Rural Tourist Commercial
S&W	Shannon & Wilson, Inc.
SACTI	Seasonal/Annual Cooling Tower Impact
SCR	selective catalytic reduction
SHPO	State Historic Preservation Office
Site	Perennial Wind Chaser Station project site
Station	Perennial Wind Chaser Station
SWCD	Soil and Water Conservation District
TIA	Traffic Impact Analysis
UCDC	Umatilla County Development Code
UEC	Umatilla Electric Cooperative
UGA	Urban Growth Area
UGB	Urban Growth Boundary
UPRR	Union Pacific Railroad
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
VBV	variable bleed valve
WPCF	Water Pollution Control Facilities
ZLD	zero liquid discharge

EXHIBIT A

APPLICANT INFORMATION

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

TABLE OF CONTENTS

APPENDICES

A.1 NAME AND ADDRESS OF APPLICANT AND CONTACT PERSON

OAR 345-021-0010(1)(a)(A) *The name and address of the applicant including all co-owners of the proposed facility, the name, mailing address and telephone number of the contact person for the application, and if there is a contact person other than applicant, the name, title, mailing address and telephone number of that person.*

Response: Perennial-WindChaser LLC (Applicant, or Perennial), a Delaware limited liability company, is submitting this Application for Site Certificate for a nominal 415-megawatt natural gas–fueled energy facility and certain related and supporting facilities to be built near Hermiston in Umatilla County, Oregon.

Applicant's name and address:

Perennial-WindChaser LLC
300 Madison Avenue
New York, NY 10017

Contact person's name, address, and phone number:

David Daley
Senior Vice President
24 Waterway Ave., Suite 740
The Woodlands, Texas 77380
281-719-8825
david.daley@perennialpower.net

Contact persons other than Applicant:

Richard H. Allan
Permitting Attorney
Marten Law
1001 SW Fifth Avenue, Suite 1500
Portland, Oregon 97204
503-241-2643
rallan@martenlaw.com

Paul Neil, PE, BCEE
Permitting Project Manager
RTP Environmental Associates, Inc.
2050 Torrey Pines Road
La Jolla, CA 92037
858-456-8020
pneil@rtpenv.com

A.2 PARTICIPANT INFORMATION

OAR 345-021-0010(1) (a) (B) *The contact name, address, and telephone number of all participating persons, other than individuals, including but not limited to any parent corporation of the applicant, persons upon whom the applicant will rely for third-party permits or approvals related to the facility, and, if known, other persons upon whom the applicant will rely in meeting any facility standard adopted by the Council.*

Response: Listed below are participants upon whom Perennial will rely for third-party permits and approvals. In addition, there will be potential third-party permits that would be obtained by the construction firm selected to build the facility. Perennial anticipates that these third-party permits may include permits for obtaining aggregate and other construction materials, transporting materials to the site, and other building-related permits that are typically obtained immediately prior to construction activities. The impacts of construction traffic are addressed in Exhibit U – Public Services, which includes a Traffic Impact Analysis. As indicated in Exhibit E – Permits Required, Perennial or its contractors may have to obtain Oregon Department of Transportation permits for transporting oversized equipment on state highways during construction. Pursuant to Oregon Revised Statutes 469.401(4), those permits are not addressed in the Site Certificate Application, even though the impacts of construction traffic are addressed under the Council's Public Services Standard.

Port of Umatilla (for water supply)
505 Willamette Street
Umatilla, OR 97882
Attn.: Kim Puzey, General Manager
541-992-3224

Hermiston Generating Company and PacifiCorp (for reclaimed water)
78145 Westland Road
Hermiston, OR 97838-8315
Attn.: Richard Moroney, Plant Director
541-564-8320

Lamb Weston (for reclaimed water)
78153 Westland Road
Hermiston, OR 97838
Attn.: Dave Nevin, Energy and Environmental Manager
541-567-2211

A.3 CORPORATE INFORMATION

OAR 345-021-0010(1)(a)(C) *If the applicant is a corporation, it shall give: (i) The full name, official designation, mailing address, email address and telephone number of the officer responsible for submitting the application; (ii) The date and place of its incorporation; (iii) A* *copy of its articles of incorporation and its authorization for submitting the application; and (iv) In the case of a corporation not incorporated in Oregon, the name and address of the resident attorney-in-fact in this state and proof of registration to do business in Oregon*

Response: Not Applicable.

A.4 MISCELLANEOUS INFORMATION

OAR 345-021-0010(1)(a)(D) *If the applicant is a wholly owned subsidiary of a company, corporation, or other business entity, in addition to the information required by OAR 345-021-0010(1)(a)(C), it shall give the full name and business address of each of the applicant's full or partial owners;*

Response: Perennial-WindChaser LLC is a wholly owned subsidiary of Perennial Power Holdings, Inc.

Perennial Power Holdings, Inc.
300 Madison Avenue
New York, NY 10017

Perennial Power Holdings, Inc. is a wholly owned subsidiary of Sumitomo Corporation and Sumitomo Corporation of America. Sumitomo Corporation of America owns 49.99% of Perennial Power Holdings, Inc., and Sumitomo Corporation owns 50.01%.

Sumitomo Corporation:	Harumi Island Triton Square Office Tower, Y 8-11 Harumi Chome Chuo-ku, Tokyo 104-8610 Japan
Sumitomo Corp. of America:	300 Madison Avenue New York, NY 10017

OAR 345-021-0010(1)(a)(E) *If the applicant is an association of citizens, a joint venture or a partnership, it shall give: (i) The full name, official designation, mailing address and telephone number of the person responsible for submitting the NOI; (ii) The name, business address and telephone number of each person participating in the association, joint venture or partnership and the percentage interest held by each; (iii) Proof of registration to do business in Oregon; (iv) A copy of its articles of association, joint venture agreement or partnership agreement and a list of its members and their cities of residence; and (v) If there are no articles of association, joint venture agreement or partnership agreement, the applicant shall state that fact over the signature of each member;*

Response: Not Applicable.

OAR 345-021-0010(1)(a)(F) *If the applicant is a public or governmental entity, it shall give: (i) The full name, official designation, mailing address and telephone number of the person responsible for submitting the application; and (ii) written authorization from the entity's governing body to submit an application;*

Response: Not Applicable.

OAR 345-021-0010(1) (a) (G) *If the applicant is an individual, the individual shall give his or her mailing address and telephone number.*

Response: Not Applicable.

OAR 345-021-0010(1)(a)(H) *If the applicant is a limited liability company, it shall give: (i) The full name, official designation, mailing address, email address and telephone number of the officer responsible for submitting the application; (ii) The date and place of its formation; (iii) A copy of its articles of organization and its authorization for submitting the application; and (iv) In the case of a limited liability company not registered in Oregon, the name and address of the resident attorney-in-fact in this state and proof of registration to do business in Oregon. If the applicant is an individual, the individual shall give his or her mailing address and telephone number.*

Response:

(i) *Officer:* Shigenobu Hamada, President of Perennial Power Holdings, Inc.
Member of Perennial-WindChaser LLC
300 Madison Avenue
New York, NY 10017
212-207-0569
Shigenobu.hamada@perennialpower.net

(ii) *Date and Location of Formation:*

Response: April 30, 2013 in Delaware

(iii) *Copy of Articles of Organization and authorization for submitting this application:*

Response: A copy of Perennial-WindChaser LLC's Certificate of Formation, Operating Agreement and Certificate of Good Standing is provided in Appendix A-1, and a letter of authorization is provided as Appendix A-2.

(iv) In the case of a limited liability company not registered in Oregon, the name and address of the resident attorney-in-fact in this state and proof of registration to do business in Oregon.

Response: Ball Janik LLP serves as the Applicant's primary Oregon legal counsel. The registered agent and "attorney in fact" for purposes of registration in the State of Oregon are:

Ball Janik Service Company
101 SW Main Street, Suite 1100
Portland, OR 97204
503-228-2525

Proof of registration for the Applicant to do business in Oregon is included as Appendix A-3.

APPENDIX A-1

Certificate of Formation, Operating Agreement, and Certificate of Good Standing

Delaware

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF FORMATION OF "PERENNIAL-WINDCHASER LLC", FILED IN THIS OFFICE ON THE TWENTY-SIXTH DAY OF APRIL, A.D. 2013, AT 2:26 O'CLOCK P.M.

SECRETARY OF STATE
1776 DELAWARE 1970

Jeffrey W. Bullock, Secretary of State

5325492 8100

AUTHENTICATION: 0394871

130490153

DATE: 04-30-13

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of Delaware
Secretary of State
Division of Corporations
Delivered 02:33 PM 04/26/2013
FILED 02:26 PM 04/26/2013
SRV 130490153 - 5325492 FILE

CERTIFICATE OF FORMATION

OF

PERENNIAL-WINDCHASER LLC

This Certificate of Formation of Perennial-WindChaser LLC (the "LLC"), dated as of April 26, 2013, is being duly executed and filed by Kyle D. Wuepper, as an authorized person, to form a limited liability company under the Delaware Limited Liability Company Act (6 Del. C. §18-101, et seq.).

FIRST. The name of the limited liability company formed hereby is Perennial-WindChaser LLC.

SECOND. The address of the registered office of the LLC in the State of Delaware is c/o The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, New Castle County, Delaware 19801.

THIRD. The name and address of the registered agent for service of process on the LLC in the State of Delaware is The Corporation Trust Company, Corporation Trust Center, 1209 Orange Street, Wilmington, New Castle County, Delaware 19801.

IN WITNESS WHEREOF, the undersigned has executed this Certificate of Formation as of the date first above written.

Kyle D. Wuepper, Authorized Person

LIMITED LIABILITY COMPANY OPERATING AGREEMENT
OF
PERENNIAL-WINDCHASER LLC

1. General. The undersigned sole member of Perennial-WindChaser LLC, a Delaware limited liability company (the "Company"), makes this Limited Liability Company Operating Agreement as of May 24, 2013 (this "Agreement"). The undersigned member agrees to conduct the Company's affairs in a manner consistent with the Delaware Limited Liability Company Act, as amended (the "Act"), the Company's Certificate of Formation (the "Certificate") and this Agreement. In the event of any conflict, this Agreement shall control to the extent permitted by law. The provisions of this Agreement are for the regulation of the member and the Company, are not intended for the benefit of non-member creditors and do not grant any rights to non-member creditors.

2. Duration of Company. The Company shall have perpetual existence unless and until dissolved by action of the member.

3. Purpose. The purpose of the Company shall be to engage in any lawful business permitted under the Act as determined from time to time by the member.

4. Membership Interests. Membership interests in the Company shall be expressed in percentages. Perennial Power Holdings, Inc., a Delaware corporation, holds a 100% membership interest in the Company.

5. Management by Member. The affairs of the Company shall be managed by the member. The member shall have authority to execute documents on behalf of the Company, and the signature of the member on behalf of the Company shall be binding on the Company.

6. Limited Liability; Indemnification. The liability of the member shall be limited to the fullest extent permitted by law. The Company shall indemnify the member against any loss, cost and expense the member may incur in the capacity of member and shall defend the member against any claims made against the member in such capacity.

7. Tax Status of Company; Allocation of Profits and Losses. The Company shall be disregarded for tax purposes for so long as it has a sole member and, during such period, will report for tax purposes on the tax return of its sole member. At any time the Company has more than one member and is therefore a partnership for tax purposes, it shall file a partnership information return and provide Forms K-1 to its members. In such case, the profits and losses of the Company shall be allocated to and pass through to the members in accordance with their membership interests.

8. Distributions of Cash or Other Property. The Company will from time to time make distributions of cash or property to the member, at such times and in such amounts as are determined by the member.

9. Transfers of Interests. Upon any transfer of an interest in the Company, the transferee shall be an assignee only unless admitted as a member in a writing executed by the member and the transferee that binds the transferee to all provisions of this Agreement and contains the consent of the member to admission of the transferee as a member.

10. Withdrawal; Dissolution. The member does not have the right or power to withdraw voluntarily from the Company. Any purported withdrawal shall be ineffective,

shall be a breach of this Agreement and shall not entitle the member to any distribution from the Company. Notwithstanding the foregoing, the Company may be dissolved at any time with the approval of the member.

11. Amendments. This Agreement may be amended only by a writing signed by the member.

IN WITNESS WHEREOF, the member has executed this Operating Agreement of the Company as of the date first set forth above.

PERENNIAL POWER HOLDINGS, INC.
a Delaware corporation

By: S. Hamada
Shigenobu Hamada
Its: President

CERTIFICATE

State of Oregon

OFFICE OF THE SECRETARY OF STATE
Corporation Division

I, KATE BROWN, Secretary of State of Oregon, and Custodian of the Seal of said State, do hereby certify:

A Limited Liability Company
organized under the laws of
Delaware
was authorized to transact business in Oregon
as
PERENNIAL-WINDCHASER LLC
on
August 9, 2013.
I further certify that
PERENNIAL-WINDCHASER LLC
is active on the records of the Corporation Division as of the date of this certificate.

In Testimony Whereof, I have hereunto set my hand and affixed hereto the Seal of the State of Oregon.

KATE BROWN, Secretary of State
August 12, 2013

APPENDIX A-2

Letter of Authorization

Perennial-WindChaser LLC

Oregon Department of Energy
625 Marion Street NE
Salem, OR 97301-3737

Reference: Application for Site Certificate - Perennial Wind Chaser Station

To whom it may concern:

In response to the requirements of OAR 345-021-0010(1)(a)(H), please be advised that I am authorized to submit this Application for Site Certificate on behalf of Perennial-WindChaser LLC ("PWC"). A copy of PWC's Articles of Incorporation is attached. Pursuant to Article 3, PWC is organized to engage in "any lawful act or activity for which a company may now or hereafter be organized" under the General Corporation Law of the State of Delaware.

I am the President of Perennial Power Holdings, Inc., the sole member of PWC and am authorized to make application for certificates and sign in the name of the company instruments, certificates and documents of any type or kind.

Sincerely,

PERENNIAL-WINDCHASER LLC
By: PERENNIAL POWER HOLDINGS, INC., its sole member

S. Hamada

Shigenobu Hamada
President

600 Third Ave. Suite 30F
New York, NY 10016

APPENDIX A-3

Proof of Registration

Secretary of State
Corporation Division
255 Capitol Street NE, Suite 151
Salem, OR 97310-1327

Phone:(503)986-2200
www.filinginoregon.com

Registry Number: 956503-97
Type: FOREIGN LIMITED LIABILITY COMPANY

Next Renewal Date: 08/09/2014

C/O PERENNIAL POWER HOLDINGS INC
ATTN RUMIKO TOKUHIRO
600 THIRD AVE STE 30F
NEW YORK NY 10016

Acknowledgment Letter

The document you submitted was recorded as shown below. Please review and verify the information listed for accuracy.

Document
APPLICATION FOR AUTHORITY

Filed On
08/09/2013

Jurisdiction
DELAWARE

Name
PERENNIAL-WINDCHASER LLC

Principal Place of Business
C/O PERENNIAL POWER HOLDINGS INC ATTN RU
600 THIRD AVE STE 30F
NEW YORK NY 10016

Registered Agent
BALL JANIK SERVICE COMPANY
101 SW MAIN ST STE 1100
PORTLAND OR 97204

Mailing Address
C/O PERENNIAL POWER HOLDINGS INC
ATTN RUMIKO TOKUHIRO
600 THIRD AVE STE 30F
NEW YORK NY 10016

HEAPRE
ACK
08/12/2013

Application for Authority to Transact Business - Foreign Limited Liability Company

Secretary of State - Corporation Division - 255 Capitol St. NE, Suite 151 - Salem, OR 97310-1327 - http://www.FilingInOregon.com - Phone: (503) 986-2200

FILED

AUG 09 2013

OREGON
SECRETARY OF STATE

REGISTRY NUMBER: 956503-97
For office use only

In accordance with Oregon Revised Statute 192.410-192.490, the information on this application is public record.
We must release this information to all parties upon request and it will be posted on our website.

For office use only

Please Type or Print Legibly in **Black** Ink. Attach Additional Sheet if Necessary.

1) NAME: Perennial-WindChaser LLC

NOTE: (Must contain the words "Limited Liability Company" or the abbreviations "LLC" or "L.L.C.") Must be identical to the name of record in home jurisdiction.

2) REGISTRY NUMBER IN HOME JURISDICTION 5325492

OR: CERTIFICATE OF EXISTENCE ☒ (ATTACHED)

(Please provide a web-verifiable registry number from the entity's home jurisdiction. Certain states, such as Delaware and New Jersey, do not provide status information online. Entities from such places must instead attach an official certificate of existence, current within 60 days of delivery to this office.)

3) DATE OF ORGANIZATION: April 26, 2013

DURATION, IF NOT PERPETUAL:

4) STATE OR COUNTRY OF ORGANIZATION: Delaware

5) THIS FOREIGN LIMITED LIABILITY COMPANY SATISFIES THE REQUIREMENTS OF ORS 63.714(3).

6) NAME OF OREGON REGISTERED AGENT: Ball Janik Service Company

7) REGISTERED AGENT'S PUBLICLY AVAILABLE ADDRESS:
(Must be an Oregon Street Address, which is identical to the registered agent's business office.)

101 SW Main Street, Suite 1100
Portland, OR 97204

8) ADDRESS OF PRINCIPAL OFFICE OF THE BUSINESS:

c/o Perennial Power Holdings, Inc., 600 Third Ave, Suite 30F
New York, NY 10016 Attn: Rumiko Tokuhiro.

9) ADDRESS WHERE THE DIVISION MAY MAIL NOTICES:

c/o Perennial Power Holdings, Inc., 600 Third Ave, Suite 30F
New York, NY 10016 Attn: Rumiko Tokuhiro.

10) HOW WILL THIS LIMITED LIABILITY COMPANY BE MANAGED?

- ☒ This LLC will be member-managed by one or more members.
- ☐ This LLC will be manager-managed by one or more managers.

11) EXECUTION: (At least one member or manager must sign.)
By my signature, I declare as an authorized authority, that this filing has been examined by me and is, to the best of my knowledge and belief, true, correct, and complete. Making false statements in this document is against the law and may be penalized by fines, imprisonment or both.

Signature:	Printed Name:	Title:
S. Hamada	Shigenobu Hamada	President, of Perennial Power Holdings, Inc., Member

CONTACT NAME: (To resolve questions with this filing.)
Carole E. Brock

PHONE NUMBER: (Include area code.)
(503) 228-2525

FEES

Required Processing Fee $275

Processing Fees are nonrefundable. Please make check payable to "Corporation Division."

Free copies are available at FilingInOregon.com, using the Business Name Search program.

Department of State: Division of Corporations

Entity Details

File Number:	**5325492**	Incorporation Date / Formation Date:	**04/26/2013** (mm/dd/yyyy)
Entity Name:	**PERENNIAL-WINDCHASER LLC**		
Entity Kind:	**LIMITED LIABILITY COMPANY (LLC)**	Entity Type:	**GENERAL**
Residency:	**DOMESTIC**	State:	**DE**
Status:	**GOOD STANDING**	Status Date:	**04/26/2013**

REGISTERED AGENT INFORMATION

Name:	**THE CORPORATION TRUST COMPANY**		
Address:	**CORPORATION TRUST CENTER 1209 ORANGE ST**		
City:	**WILMINGTON**	County:	**NEW CASTLE**
State:	**DE**	Postal Code:	**19801**
Phone:	**(302)658-7581**		

Additional Information is available for a fee of $20.00. This information will include current franchise tax assessment, current filing history and more..

Would you like ○Tax & History Information [Submit]

[Back to Entity Search]

To contact a Delaware Online Agent click here.

EXHIBIT B

PROJECT INFORMATION
OAR 345-021-0010(1)(b)

TABLE OF CONTENTS

TABLES

FIGURES

B.1 INTRODUCTION

OAR 345-021-0010(1)(b) *Information about the proposed facility, construction schedule, and temporary disturbances of the site.*

Response: Perennial-WindChaser LLC (Perennial) proposes to construct and operate up to four General Electric (GE) LMS100 (or equivalent) natural gas–fired combustion turbine generators (CTGs) in simple cycle, which will produce up to approximately 415 megawatts (MW) of electric power. The design and location of the Perennial Wind Chaser Station project (Project) will provide excellent load shaping of the irregular and volatile wind-generated electricity produced along the Columbia River, which will help to stabilize the electric power grid in the area and make the area more attractive for further renewables development.

Within this Application for Site Certificate (ASC), the term "Site" includes the proposed location of the energy facility and its related or supporting facilities. "Site Boundary" is the perimeter of the Site, including the rights-of-way (ROWs) of the laterals and the temporary laydown area. Figure B-1 provides an overview of the Site and Site Boundary. Within the Site, there are five areas:

1) The "Energy Facility Site" refers to an area adjacent to the Hermiston Generating Plant (HGP), the boundary for which is defined as laid out in Figure B-2, a site plan overview. This site is the location of the proposed power generating facility, herein called the "Station." Figure B-3, a detailed site plan, shows the location of equipment and structures within the Station.
2) A temporary laydown area adjacent to the Station, process pipelines to the HGP, and any utility lines to the Station.
3) The transmission line ROW includes a 50-foot buffer around the existing HGP transmission line, along with additional tie-ins with the onsite switchyard and with a small transformer yard. The transmission line extends northward to the Bonneville Power Administration (BPA) McNary Substation, located approximately 11.59 miles from the Station.
4) The "step-up substation" is a new 500-kilovolt (kV) step-up substation to be located south of the BPA McNary Substation to increase voltage of the line from 230 to 500 kV. An underground high voltage cable and aboveground transition structure will connect the step-up substation with the BPA McNary Substation.
5) The "natural gas pipeline" is a new pipeline lateral to be built within the existing 50-foot natural gas ROW that serves the HGP. The natural gas pipeline extends south-ward from the Energy Facility Site to the area of an existing meter station situated next

to the main Gas Transmission Northwest (GTN) natural gas pipeline. New metering equipment will be added within the footprint of the existing metering station servicing the HGP. Modifications at the meter station will be conducted by GTN under their blanket Federal Energy Regulatory Commission (FERC) agreement and connect the lateral to the main pipeline operated by GTN, located approximately 4.63 miles south of the proposed Station.

The new natural gas pipeline lateral will be owned and operated by Cascade Natural Gas Corporation (CNG). The meter station will be owned by GTN but operated by CNG. The temporary laydown and fill stockpiling off of the property is owned by Hermiston Generating Company & PacifiCorp. The existing transmission line is owned and operated by Umatilla Electric Cooperative (UEC). See Exhibit C – Location, for a more detailed description of the proposed facility location and areas of permanent and temporary disturbances.

This exhibit includes a complete description of the proposed facility. Since the Station will be a natural gas–fueled simple cycle generating plant, Oregon Administrative Rule (OAR) 345-021-0010(1)(b)(A)(vii) and OAR 345-021-0010(1)(b)(A)(viii) are not applicable to this ASC and are omitted from this exhibit.

B.2 SUMMARY

The Station will be located near the existing HGP and will be accessed via Westland Road, which provides access to Interstate Highways 82 and 84. The Station site is currently clear of any significant structures or vegetation; it will be leveled prior to construction, with any topsoil stockpiled for reuse at the conclusion of construction.

The Station will include four generating units, each consisting of one GE LMS100 combustion turbine, intercooler heat exchanger, electrical generator, selective catalytic reduction (SCR) unit, catalytic oxidation unit, and a stack. The Station will burn natural gas only. The LMS100 utilizes an intercooler to lower air inlet temperature between the low pressure compressor (LPC) and high pressure compressor (HPC) to increase overall efficiency. Heat from the intercooler is released to the atmosphere using a wet cooling tower. Each generating unit is connected to a common cooling tower. Each block will be maintained in a ready-to-start condition during normal operation.

Each generating unit is expected to be operated normally at an equivalent of no more than 4,400 hours per year at full load with an expected 500 startups and shutdowns each year, for a total of 4,736 hours. At less than full load, total operating hours could increase. Since the purpose of the Station is to provide a steady source of electricity when wind-generated electricity cannot meet the required load, the Station will depend upon a volatile combination of timing and load. Each combustion turbine is designed to operate efficiently from 50 to 100 percent load and respond rapidly to load changes. This is consistent with the Oregon Department of Energy's acknowledgement of the restraining aspect of hourly limitations, and OAR 345-001-0010(40) defines “non-base load power plant” as follows:

> “Non-base load power plant means a fossil-fueled generating facility that is limited by the site certificate to an average number of hours of operation per year of not more than 6,600 hours. For a non-base load power plant designed to operate at variable load, the facility’s annual hours of operation are determined by dividing the actual annual electric output of the facility in megawatt-hours by the facility’s nominal electric generating capacity in megawatts.”

Perennial expects to operate the Station no more than 4,400 hours per year at full load.

B.3 PERENNIAL WIND CHASER STATION

This section provides a complete description of the major components, structure, and systems of the proposed facility. Related and supporting facilities are described in Section B.4.

B.3.1 Nominal and Average Electric Generating Capacity

OAR 345-021-0010(1)(b)(A)(i) *The nominal electric generating capacity and the average electrical generating capacity, as defined in ORS 469.300.*

Response: Nominal electric generating capacity is defined in Oregon Revised Statutes (ORS) 469.300 as the maximum net electric power output of an energy facility based on the average temperature, barometric pressure, and relative humidity at the Site during times of the year when the facility is intended to operate. The nominal electric generating capacity of the Station is expected to be approximately 415 MW.

Average electrical generating capacity is defined as the peak generating capacity of the facility divided by a factor determined by the type of facility. There are three categories of energy facilities: wind or solar facilities, which have a factor of 3.00; geothermal facilities, which have a factor of 1.11; and all other facilities, which have a factor of 1.00. Since the Station will utilize natural gas, the factor applied to the peak generating capacity is 1.00. The average electrical generating capacity of the Station is expected to be up to 415 MW.

B.3.2 Major Components, Structures, and Systems, and Site Plan

OAR 345-021-0010(1)(b)(A)(ii) *Major components, structures and systems, including a description of the size, type and configuration of equipment used to generate electricity and useful thermal energy.*

Response: The Station will include up to four Brayton cycle generating units arranged in simple cycle configuration. In this system, natural gas is combusted in the combustor of the CTG, then expands to drive the turbine generator, producing electric power. The Station will have the following major components, structures, and systems.

Combustion Turbines

Four GE LMS100 CTGs are expected to be used for the Station. The LMS100 is part of the GE aero-derivative family of turbines, and it integrates features of the frame and aero-derivative CTG design features. The LPC is derived from the heavy-duty frame engine designs, and the HPC, combustor, and power turbine components are derived from the aero-derivative designs. Each CTG consists of a stationary combustion turbine-generator and associated auxiliary equipment.

Inlet air is drawn through the air inlet ductwork located above the combustion turbine. The inlet air filter removes dust and particulate from the intake air. When the ambient temperature is above 59 degrees Fahrenheit (ºF), the filtered air is cooled by the evaporative cooler.

Filtered and cooled air drawn into the gas turbine LPC section is compressed to an intermediate pressure. An intercooler is used to cool the intermediate pressure air before it enters the HPC. Cooling the compressed air between the compressor stages reduces the work of compression for the HPC, allowing for higher pressure ratios and increasing the overall efficiency. A variable bleed valve system, located upstream of the LPC, protects the LPC and HPC from stall during transient conditions during startup and shutdown. The LMS100 is one of the most efficient models in simple cycle application.

Compressed air and natural gas are ignited and combusted in the combustor. Demineralized water generated at the water treatment building is injected into the combustor to temper the combustion temperature, which reduces the production of nitrogen oxides (NO_X). The combusted gas expands through the turbine section, rotating the turbine rotor, which in turn rotates the generator rotor to produce electrical power.

The CTG will be enclosed in a standard original equipment manufacturer weather enclosure and will be located outdoors. Aside from the turbine-generator unit, the following accessories and auxiliary systems will also be provided with the CTG to provide safe, reliable operation:

- Evaporative coolers
- Inlet air filters
- NO_X control water injection system
- Gas turbine enclosure for outdoor installation
- Gas turbine compartment ventilation system
- Fuel gas conditioning system

- Synthetic lubrication oil system
- Mineral lubrication oil system
- Automatic water wash system
- Fire detection and protection system
- Intercooler system
- Hydraulic starting system
- Vibration monitoring system

Selective Catalytic Reduction/Carbon Monoxide Catalyst System

The combustion gases exit the turbine at a range of 750–800°F and then pass through the SCR system for NO_X emission control and an oxidizing catalyst for carbon monoxide (CO) emission control. The SCR is used in conjunction with ammonia injection for the control of NO_X emissions. An ammonia injection grid injects ammonia solution into the CTG exhaust gas stream that passes over a catalyst bed, which reduces the NO_X to inert nitrogen.

The SCR equipment includes a reactor chamber, catalyst modules, aqueous ammonia storage, vaporization and injection system, and monitoring equipment and sensors. The aqueous ammonia storage area will consist of tanks on a concrete pad with a boxed containment wall. After passing though the SCR, the exhaust gases exit through the attached stack.

Ammonia Storage and Handling System

Aqueous ammonia (29 percent solution) will be delivered by truck to the site. Trucks will include unloading pumps to eliminate the need for an onsite unloading system. Two storage tanks of 12,000 gallons each will be used to contain a minimum 14-day supply at full load. Two 100 percent transfer pumps will be included to transfer the aqueous ammonia from the storage tank to the ammonia flow control units of the SCR system. Ammonia will be vaporized, then mixed with air before being injected upstream of the SCR system to reduce NO_X emissions.

Cooling Tower

A mechanical draft, wet cooling tower will be used to release heat from the intercooler to the atmosphere. A four-cell cooling tower will be used to serve all four blocks. Circulating water flow is estimated to be 28,000 gallons per minute (gpm). Makeup water to the cooling tower will come from the combined fire/raw water tank, which in turn is supplied by the pipeline from the Port of Umatilla. Blowdown from the cooling tower will be routed to the cooling tower basin of the HGP to be reclaimed and recycled.

Fuel Gas Compressors

Five electric motor–driven fuel gas compressors will be provided to increase the pipeline pressure of 680 to 750 pounds per square inch gage (psig) to approximately 950 psig to meet the gas turbine inlet pressure requirement. Final design pressure of the Station fuel gas supply line will be determined based on selection of other balance of plant equipment. Each of the fuel gas compressors will be sized to accommodate the full load requirement of one LMS100. Gas detectors and enclosure carbon dioxide (CO_2) fire suppression system will be provided for each gas compressor, monitored, and alarmed in the main plant fire panel.

Transformers and Switchyard at the Station

Electrical output from the CTGs is rated at 13.8 kV and will be connected through generator step-up (GSU) transformers to increase its voltage to 230 kV. In this case, output from two CTGs will be routed to one common GSU transformer, with a total of two GSU transformers for the four blocks. The two GSU transformers will be connected by overhead line to the 230-kV onsite switchyard to be interconnected to open 500-kV bays at the BPA McNary Substation, after the voltage is stepped up from 230 to 500 kV at the 500-kV step-up substation.

Buildings

A single pre-engineered metal building will be constructed to serve as a control room and administration building and will also house the water treatment equipment, as indicated in Figure B-3. Separate smaller buildings and enclosures will be provided to house the chemical feed equipment, electrical equipment, and alternative zero liquid discharge (ZLD) system, should this option be selected. A small building or enclosure will be provided for the following items, as identified in Figure B-3: the ZLD system, chemical feed skid, turbine control and main power distribution center, cooling tower power distribution center, 5-kV distribution panel, gas compressor motor control center, and two continuous emission monitoring sheds. The dimensions of the buildings and enclosures are shown in Table B-1

Table B-1 Building Dimensions

Component[1]	Number of Units	Dimensions (L x W x H) (feet)	Total Area (square feet)
Administration and Water Treatment Building	1	200 x 40 x 20	8,000
ZLD Building	1	60 x 120 x 45	7,200
Chemical Feed Skid	2	30 x 40 x 10	2,400
Turbine Control & Main Power	2	45 x 71 x 10	6,400

Table B-1 Building Dimensions

Component[1]	Number of Units	Dimensions (L x W x H) (feet)	Total Area (square feet)
Distribution Center			
5kV-Distribution Panel & Gas Compressor MCC	3	7.5 x 20 x 8	450
Gas Compressors	5	8 x 17.5 x 6	700
Compressor Lube Oil Skid	5	5 x 15 x 5	375
Diesel Fire Pump	1	10 x 15 x 5	150
CEMS	2	10 x 15 x 10	300

Note:
[1]Dimensions are approximate (plus or minus 1 foot). Dimensions represent one unit.

Key:

CEMS	continuous emission monitoring shed
H	height
kV	kilovolt
L	length
MCC	motor control center
W	width
ZLD	zero liquid discharge

Potable Water System

A water well rated at less than 5,000 gallons per day may be utilized for potable water supply. Another option is to use the Port of Umatilla process water supply after onsite treatment for potable water. Water supply from the Port is described in more detail in Exhibit O – Water Use. The Port has confirmed that it can supply 2,000 gpm of non-potable water to the Project. Preliminary indication is that the water supply from the Port can be used as potable water after undergoing carbon filtration. Perennial will decide how best to provide potable water to the Station after detailed engineering studies have been conducted.

Sanitary Waste Disposal

Sanitary waste from showers, wash basins, and toilet facilities will be collected and discharged to a new septic system onsite. Effluent from the septic system will then be sent to the leach field, also to be located onsite.

Fencing and Roads

The Station will be accessed from Westland Road via Interstate Highway 82 or 84. A paved loop road approximately 24 feet wide will be provided for normal truck and operator vehicle traffic and will connect with Westland Road. An entrance bridge will be constructed to cross the irrigation canal at the entrance of the Station. The loop road will be approximately 3,000 feet in length. A spur road off the loop will be provided to allow for access to structures and equipment. A paved road, 20 feet wide and 232 feet long, will also be constructed through the center of the four CTGs so that each turbine can be accessed from the paved loop. No temporary access roads will be constructed for the Project. All surfaces will be paved in areas where regular maintenance activities with mobile cranes or forklifts are anticipated. A chain-link fence with three strands of barbed wire will surround the Station. The onsite switchyard will be surrounded by its own chain-link fence to separate the high-voltage switchyard from the rest of the Station. A summary of graveled areas and uses is shown in Table B-2. The total area is 63,215 square yards without ZLD and 63,955 square yards with ZLD.

Table B-2 Summary of Gravel Uses

Use	Dimensions (Yards)	Square Yards
Temporary Construction/Laydown Area	complex polygon[1]	24,700
Substation Area	96 x 39	3,750
Generation Blocks (2)	113 x 77.5	17,500
Gas Compressors and ancillary equipment and gas metering station	41 x 80	3,300
ZLD (optional)	13 x 24, 33 x 13[2]	740
Road Underlayment	See Figure B-3.	10,800
Foundations, enclosures, and auxiliary equipment	See Figure B-3.	2,100
Brownell Ditch Road Upgrade	800 x 12	1,065

Notes:
[1]Refers to area denoted as “Temporary Construction Area” in Figure B-2.
[2]ZLD access area approximated by two rectangular areas.

Key:
ZLD zero liquid discharge

Stormwater Detention Basin

One stormwater detention basin, approximately 0.9 acres in size, will be located within the 20-acre Station fenced area. The basin will have a water storage depth of approximately 11 feet and will be sized to contain a 100-year 24-hour rainfall with a 50 percent extra capacity. Additional details are contained in Exhibit V – Solid Waste and Wastewater. Stormwater collected in the basin will be allowed to infiltrate into the ground under the basin through gravity and natural drainage. Areas exposed to industrial activity will be routed through an oil/water separator before being routed to the basin.

OAR 345-021-0010(1)(b)(A)(iii) *A site plan and general arrangement of buildings, equipment and structures.*

Response: A site plan overview; general arrangement of buildings, major components, structures, and systems; and a detailed layout of interconnecting pipelines are shown on Figures B-2, B-3, and B-4, respectively.

The Station will be located within a fenced enclosure consisting of slightly less than 20 acres. Visible features of the Station will include the CTG structures: exhaust stacks, the mechanical draft cooling tower, a water treatment building, water tanks, ammonia storage tanks, control and administration building, and generator step-up auxiliary transformers.

OAR 345-021-0010(1)(b)(C) *The approximate dimensions of major facility structures and visible features.*

Response: Each CTG block will be designed for outdoor installation with an integral weather-protection enclosure and will be contained within a footprint of approximately 200 by 100 feet, including an area occupied by the intercooler, cooling water pump skid, auxiliary equipment, and power control module. The height of the structure will be approximately 50 feet. The intake air filter for the combustion turbine will be approximately 40 feet wide and 45 feet tall. Each block will connect to a steel exhaust stack approximately 90 feet tall and 17 feet in diameter.

The SCR/CO catalyst system will be a metal structure connected to the combustion turbine exhaust flange with an expansion joint and extending lengthwise at a 90-degree angle to the CTG train. The SCR system will slope up from the exhaust flange to a height of approximately 40 feet before exhausting to the stack. The length of the SCR/CO catalyst system will range from 60 to 70 feet, depending on final equipment selection. The width of the SCR/CO catalyst system is expected to be approximately 25 feet.

The mechanical draft cooling tower will include a concrete basin surrounding a water cooling medium contained within a paneled structure mounted on support legs within the concrete basin, with fans located on top of the paneled structure. Each fan will be located within an open top bell- or cone-shaped housing to exhaust air that has been pulled under and through the water-cooling medium. The cells of the cooling tower will be arranged one cell wide, with the maximum number of cells not expected to exceed four. Cooling tower dimensions are expected to be approximately 40 by 165 feet, with the top of the paneled structure approximately 30 feet above grade and top of the fan exhaust bell- or cone-shaped housing approximately 40 feet above grade.

The control room and administration area, along with the water treatment equipment, will be located within a single pre-engineered metal building with a metal roof and side wall panels. The building is expected to be approximately 200 feet long, 40 feet wide, and 20 feet tall. Equipment for the ZLD system will be housed inside a 60- by 120-square-foot building approximately 45 feet in height. The five temporary construction offices will each have a footprint of approximately 10 by 36 feet with a ceiling height of 8 feet.

The water supply and reclaimed water pipelines will be located below grade. From the Station to the meter station, the natural gas pipeline will be underground and thus not visible. Within the meter station area, it is expected that GTN will construct new above and below ground piping systems, possibly two additional small buildings measuring about 35 by 15 feet and about 20 feet tall, and possibly several small sheds. The piping from the meter station to the main GTN gas line is underground.

The six potential new transmission line poles that may be needed to connect to the existing transmission line will be similar in design and size to the existing line. The poles are expected to be about 95 feet tall. The reconductoring of the existing transmission line will cause no noticeable visual change to the transmission line. The step-up substation will have aboveground and underground aspects and will be similar in design and size to the McNary Substation. The step-up substation structures are expected to be approximately 300 feet wide by 420 feet long and 20 feet in height. The circuitry from the step-up substation to the riser termination structure is all underground. The riser termination structure, associated isolation circuitry, and bus supports at the McNary substation are expected to be approximately 50 feet wide by 200 feet long and 53 feet in height. The circuitry from the associated isolation circuitry to the McNary Substation will be above ground at approximately 50 feet.

B.3.3 Fuel and Chemical Storage Facilities

OAR 345-021-0010(1)(b)(A)(iv) *Fuel and chemical storage facilities, including structures and systems for spill containment.*

<u>Response</u>: Natural gas used as fuel for the Station will not be stored onsite. Fuel is further discussed in Section B.3.5. Chemicals used for various water treatment processes will be stored in permanent aboveground tanks steel bulk storage tanks or in portable plastic tanks (totes), as outlined in Table B-3.

Table B-3 Water Treatment Process Chemical Storage

Material	Purpose	Plant Usage without ZLD System	Plant Usage with ZLD System	Maximum Amount Stored	Storage Type	Location (see Figure B-3)
Sulfuric acid	Circulating water and cooling tower treatment	58 gpd	67 gpd	6,000 gallons	Bulk storage tank	Chemical Feed Skid
Scale/corrosion inhibitor	Cooling tower treatment	13 gpd	5 gpd	400 gallons	Tote	Chemical Feed Skid
Sodium hypochlorite	Circulating water and cooling tower treatment	108 gpd	40 gpd	6,000 gallons	Bulk storage tank	Chemical Feed Skid
	Service water treatment	210 gpd	65 gpd	6,000 gallons	Bulk storage tank	
Sodium bisulfate	Demineralized system reverse osmosis/HERO	2 gpd	7 gpd	400 gallons	Tote	Water Treatment Building
Scale inhibitor	Demineralized system reverse osmosis	2 gpd	2 gpd	400 gallons	Tote	Water Treatment Building
Filter Aid	Service water treatment	840 gpd	55 gpd	2 x 12,000 gallons/6000 gallons	Bulk storage tank	Water Treatment Building
Polymer	HERO clarifier	None	33 gpd	6,000 gallons	Bulk storage tank	ZLD Building
Coagulant	HERO clarifier	None	33 gpd	6,000 gallons	Bulk storage tank	ZLD Building
Caustic	HERO weak acid cation inlet	None	16 gpd	400 gallons	Tote	ZLD Building
Acid	HERO weak acid cation outlet	None	16 gpd	400 gallons	Tote	ZLD Building
Antiscalant	HERO	None	8 gpd	400 gallons	Tote	ZLD Building

Key:
gpd gallons per day
HERO high efficiency reverse osmosis
ZLD zero liquid discharge

Fuel used for vehicles will not be stored onsite. Chemicals (aqueous ammonia) used in emission control processes will be stored in steel horizontal sealed storage tanks and will meet any secondary containment requirement. Miscellaneous chemicals and lubricants will be stored in Station buildings. Compressed gases will be stored in rented tanker trailers specifically designed for the contained gas or in returnable cylinders located in the control/administration building secured by chain to the building wall to prevent falling. Some cylinders will be located at the continuous emission monitoring sheds and also secured by chain to the enclosure walls. The chemicals anticipated to flow into and out of the Station are listed in Exhibit G – Materials Analysis, along with measures to prevent and contain spills.

B.3.4 Fire Prevention and Control

OAR 345-021-0010(1)(b)(A)(v) *Equipment and systems for fire prevention and control.*

Response: A fire protection system will be provided and designed to meet the requirements of the Oregon Fire Code, as amended from time to time, the Uniform Fire Code in effect at the time of construction, and all other applicable fire protection standards in effect at the time of construction. The fire protection system will include a fire water system, a CO_2 extinguishing system provided with the CTGs, portable fire extinguishers, and smoke detection system. A loop road system within the Station will connect to Westland Road. The road will be paved with asphalt and will be approximately 24 feet wide.

The fire water system will include a fire water supply loop, fire hydrants, sprinkler systems, and fire hoses placed at appropriate locations. The Station will be connected to the Port of Umatilla to provide water for the fire water system. However, in the event that the Port of Umatilla cannot provide sufficient capacity or pressure, the current layout includes a combined fire/raw water tank with a reserved fire water flow of 250,000 gallons, which will allow for a 2-hour supply of 1,500 gpm continuous maximum fire flow demand of the sprinkler system with 500-gpm hose stream, for a total expected capacity of 2,000 gpm. An electric motor–driven pump with a backup diesel generator fire pump will also be furnished to pump fire water from the tank to the fire water loop. Actual fire water flow requirements will be determined based on detailed design using the 2-hour fire water flow criteria for dedicated fire water storage. If the Port proves able to provide sufficient capacity and pressure, the fire water reserve in the combined fire/raw water tank and the fire water pumps will not be required.

The enclosure of the combustion turbine will be protected by a CO_2 system provided by the CTG original equipment manufacturer. The enclosure is designed for weather protection and is normally unoccupied. If a fire were to be detected, an alarm would sound to alert personnel prior to the discharge of CO_2. Similar to the CTG enclosure, each fuel gas compressor will also be provided a CO_2 suppression system inside the compressor enclosure with alarm and monitoring.

A portable fire extinguisher will be placed at key locations within the Station, approximately 300 to 500 feet apart. The type and number of portable extinguishers will conform to code requirements.

Outdoor oil-filled generator step-up transformers and auxiliary transformers will be surrounded by fire rated walls as required to provide the necessary fire barriers between the transformers and between the transformers and other occupied or flammable structures.

B.3.5 Source, Quantity, and Availability of Fuel

OAR 345-021-0010(1)(b)(A)(vi)(I) *A discussion of the source, quantity and availability of all fuels proposed to be used in the facility to generate electricity or useful thermal energy.*

Response: The CTGs will use natural gas as their only fuel. The Project's total natural gas consumption is anticipated to be approximately 89.3 million standard cubic feet per day, assuming a 12-hour operation at full load. The Station will be served by a gas pipeline lateral, to be owned and operated by CNG. This lateral pipeline will extend southward from the Energy Facility Site to the area of an existing meter station situated next to the main GTN natural gas pipeline. New metering equipment will be added within the footprint of the existing metering station footprint servicing the HGP. Modifications at the meter station will be conducted by GTN under their blanket FERC agreement and connect the lateral to the main pipeline operated by GTN. The meter station will be operated by CNG. The routing will be sited entirely within the existing ROW for the lateral that services the HGP. The pipeline is expected to be new construction and will run parallel to the existing pipeline as it reaches the boundary of the Station on the north side. This interconnecting lateral will be approximately 12 to 18 inches in diameter and measure approximately 4.63 miles in length.

B.3.6 Process Flow

OAR 345-021-0010(1)(b)(A)(vi)(II) *Process flow, including power cycle and steam cycle diagrams to describe the energy flows within the system.*

Response: Figure B-5 provides a power cycle and steam cycle diagram to describe the energy flows within the Station system.

B.3.7 Disposal of Waste Heat

OAR 345-021-0010(1)(b)(A)(vi)(III) *Equipment and systems for disposal of waste heat.*

Response: The CTG intercooler removes heat from the HPC. The intercooler is in turn cooled by the cooling water provided by the wet cooling tower. Waste heat from the heated cooling water is removed by the wet cooling tower through the process of evaporation. The cooled cooling water is then returned to the intercooler to cool the HPC. Makeup water to the cooling tower will be obtained from the combined fire/raw water tank. Blowdown from the cooling tower will be sent to the cooling tower basins of the adjacent HGP to be reclaimed and recycled. Exhibits O and V discuss water uses and wastewater disposal, respectively.

B.3.8 Fuel Chargeable to Power Heat Rate

OAR 345-021-0010(1)(b)(A)(vi)(IV) *Fuel chargeable to power heat rate.*

Response: The Station will not be a co-generation facility. All of the fuel consumed will be chargeable to the heat rate. Therefore, fuel chargeable to power heat rate is equal to the net plant heat rate of the unit, which is 8,781 British thermal units per kilowatt hour, higher heating value, on an annual average ambient day.

The fuel chargeable to power heat rate indicated above is approximate and will depend on the actual parameters guaranteed by the CTG original equipment manufacturer, as well as other balance-of-plant equipment selected during detailed design.

B.4 RELATED AND SUPPORTING FACILITIES MAJOR COMPONENTS, STRUCTURES, AND SYSTEMS

OAR 345-021-0010(1)(b)(B) *A description of major components, structures and systems of each related or supporting facility.*

Response: The Station will also include the following supporting structures and systems.

Natural Gas Pipeline

A natural gas pipeline lateral will also be constructed to provide fuel for the Station. This lateral, to be owned and operated by CNG, will bring natural gas to the Energy Facility Site from an existing pipeline owned by GTN. The natural gas pipeline lateral will tap the GTN pipeline approximately 4.63 miles south of the Energy Facility Site, at the existing GTN metering station servicing HGP, and will be approximately 12 to 18 inches in diameter. The new pipeline will be located within the established 50-foot-wide ROW associated with the HGP gas pipeline. This pipeline lateral is also discussed in Section B.3.5.

Transmission Line

The existing transmission structures, which carry the 230-kV transmission line connecting the HGP with the BPA McNary Substation, will be utilized for the Project. UEC owns and operates this transmission line. The transmission structures currently support two distinct circuits: 1) the HGP’s 230-kV circuit to BPA McNary on one side of the structures, and 2) UEC 115-kV line. The Project will replace UEC’s 115-kV line on the existing structures with a new 230-kV single circuit transmission line. The UEC may need to route and construct a new 115-kV transmission line.

The initial tie-in to the Hermiston to McNary transmission line will occur at the northwest corner of the Energy Facility Site. From the onsite switchyard in southwest corner of the Energy Facility Site (within fence line), it is expected that the installation of four new towers or poles will be necessary to reach the Energy Facility Site boundary at the Site's northwestern corner. From the northwest corner of the Energy Facility Site, the transmission line will then cross Westland Road to a fifth new pole on the western side of Westland Road. This pole will connect with the existing structures of the Hermiston to McNary line. The first connecting pole of the existing line may need to be replaced with a new pole or otherwise modified. If that pole is replaced, there would be a total of six new transmission poles required for the Project (otherwise only five new poles). Both proposed and existing transmission poles are identified in Exhibit C, Figure C-7.

UEC has existing ROWs for the western side of the road. Assuming that two new poles will be necessary on the west side of Westland Road (i.e., one existing pole will need to be replaced), about 0.46 acres of land will be temporarily disturbed during this installation. A new ROW (aboveground) is expected to be necessary across Westland Road to connect the new transmission line from the northwest corner of the Station to the first proposed new pole on the west side of Westland Road. The distance from the boundary at the northwest corner of the Station to the first new connecting pole on the west side of Westland Road is 215 feet. The new 215-foot-long ROW associated with the initial tie-in for the Project will be 100 feet wide; however, any ground disturbances associated with the installation of these two poles will occur either in boundary of the Energy Facility Site, or in the existing UEC ROW (included in 0.46-acre estimate above). Disturbances associated with the four new poles located in the Energy Facility Site are considered permanent impacts and grouped with the disturbance acres for the site as a whole (see Exhibit C, Table C-1).

No additional access road is required for this length of transmission line, as it can be accessed by either the new entrance road or Westland Road. From the Hermiston tie-in, the Wind Chaser portion of the 230-kV line will run for approximately 11.59 miles before terminating at the 500-kV step-up substation. No new poles are expected to be necessary for this portion of the line. During the reconductoring of the new 230-kV line, pulling stations, consisting of mobile equipment, will be required approximately every 3 miles and at turns, pulling and tightening the wires of the transmission line. This mobile equipment will stay within the boundaries of the existing transmission line ROW. In addition, Perennial will work with the HGP to ensure that there will be no interruptions of service to the HGP.

500-kV Step-Up Substation

The 500-kV step-up substation will be located south of the BPA McNary Substation, on the other side of the railroad track. This switchyard will increase the voltage of the incoming 230-kV line to 500 kV before interconnecting to the McNary Substation. The 500-kV transformer yard will be open-air, of alternating current, and be constructed on a leveled and graveled area, approximately 3 acres in size and surrounded by a security fence. Circuit breakers and disconnect switches will be included to allow for clearing faults on the connected transmission lines and maintenance of the circuit breakers and transmission lines. An existing dirt road branching off from the road parallel to Brownell Ditch, south of the proposed 500-kV substation, will be utilized to service the substation. The only expected improvement to this existing road will be to add gravel to the road surface. An underground line will be required to connect the 500-kV step-up substation to the McNary Substation tie-in location. The underground cable is expected to be 477 feet in length and will be installed in a concrete-encased duct bank approximately 2 feet wide by 2 feet high, with approximately 3 feet of cover. Right before entering McNary, a fenced transition structure of about 0.5 acres will be constructed to connect the underground lines to the aboveground lines of the McNary Substation.

Interconnecting Water Pipelines

A pipe to connect the Station with the existing Port of Umatilla water system, which supplies water to the HGP, will be installed below grade with a trench under the railroad tracks. The Port of Umatilla, via the existing water-delivery system serving the HGP, will be the source of all non-potable water required to meet the Station's needs. An additional wastewater pipeline will also be installed to interconnect reclaimed wastewater from the Station to the HGP.

From the raw water interconnected at the Site Boundary, the raw water line will go through a sediment filter before entering the combined fire/raw water tank. The raw water pipeline from the Port of Umatilla water system is expected to be 12 to 14 inches in diameter. The length of the new pipeline is estimated to be approximately 208 feet. The combined fire/raw water tank provides makeup water to the cooling tower and serves as the water source for the demineralized water system and fire water system.

Cooling tower blowdown from the Station will be reclaimed and sent to the cooling tower basin of the HGP to be recycled as circulating water for the HGP. Further details and water mass balance are included in Exhibit V– Solid Waste and Wastewater. Approximately 538 feet of below grade wastewater pipeline 10 to 12 inches in diameter will be constructed from the Station to the HGP to reclaim this process blowdown. Should this option not be available to the Project, then Perennial proposes to install a zero liquid discharge (ZLD) system. Reasons why Perennial is considering a ZLD are discussed in the next section.

Zero Liquid Discharge System (Alternative Scenario)

Lamb Weston's Water Pollution Control Facilities Permit allows Lamb Weston's facility to manage and dispose of the HGP's wastewater, among other wastewaters, by land application for beneficial use on the North Farm and the Madison Farm in accordance with the Operations, Monitoring, and Management Plan approved by the Oregon Department of Environmental Quality. Lamb Weston's permit is currently being renewed. Because this permit is under review, Lamb Weston has not been able to consent to the Project sending reclaimed water to the HGP. If Lamb Weston is eventually able to accept reclaimed water from the HGP that has come from the Station, then Perennial prefers to have all the necessary process and approvals in place to do so. Should Lamb Weston not be able to accept reclaimed water from the HGP that has come from the Station, then Perennial would install a ZLD system.

The ZLD system would consist of a clarifier, a high efficiency reverse osmosis (HERO) system, and a crystallizer. The HERO process consists of a week acid cation exchanger, removal of carbon dioxide and a reverse osmosis system. Cooling tower blowdown and miscellaneous plant wastewaters would first be routed to the clarifier to remove suspended solids. The clarifier effluent then would enter the HERO system. Reject water from the reverse osmosis system would be sent to the crystallizer for complete crystallization and precipitation of solids. An electric boiler would be used to generate low pressure steam for the crystallization process. Steam consumption of the crystallizer is expected to be approximately 1,500 pounds per hour at 50 pounds per square inch and 260°F.

The system would be sized to accept an approximate 140 gpm of blowdown from the cooling tower and miscellaneous plant wastewaters. A 200,000-gallon tank would also be installed to handle any potential fluctuations in the operation of the ZLD system. Effluent from the ZLD system would be returned to the cooling tower basin as makeup water, and the solids would be transported offsite for disposal in a landfill. It is estimated that 16,830 pounds per day of solids would be produced and transported offsite at a frequency of one truck load per day.

Utility Lines

Two new telecommunication lines will be constructed to connect the Station telephone and data highway system into the nearby City of Hermiston system. Both lines will be located in the corridor denoted as "utility/communications line" in Figure B-3.

Temporary Construction Facilities

An additional area adjacent to the Station will be provided for five construction offices, construction parking, construction laydown, and temporary storage of soil displaced during the construction process. Figure B-2 shows the location of this temporary construction area. The temporary construction area totals approximately 5.11 acres in size and is located to the southwest of the Station.

B.5 CORRIDOR SELECTION ASSESSMENT

OAR 345-021-0010(1)(b)(D) *If the proposed energy facility is a pipeline or a transmission line or has, as a related or supporting facility, a transmission line or pipeline that, by itself, is an energy facility, as defined in ORS 469.300, a corridor selection assessment explaining how applicant selected the corridor(s) for analysis in the application. In the assessment, applicant shall evaluate the corridor adjustments the Department has described in the project order, if any. The applicant may select any corridor for analysis in the application and may select more than one corridor. However, if applicant selects a new corridor, then applicant must explain why the applicant did not present the new corridor for comment at an informational meeting under OAR 345-015-0130. In the assessment, the applicant shall discuss the reasons for selecting the corridor(s).*

Response: This rule does not apply to either the natural gas pipeline or the transmission line. Under ORS 469.300(11), the transmission line itself does not constitute an energy facility,

The Station will utilize the UEC 115-kV side of the existing 230-kV HGP transmission towers. Subsection (i) excludes transmission lines constructed entirely within 500 feet of an existing corridor occupied by a high voltage transmission line with a capacity of 230 kV or more (the existing line is 230 kV).

For these reasons, a corridor selection assessment is not required. By placing the new lines on the existing towers, Perennial anticipates that any environmental impacts from construction will be minimized. This is consistent with recommendations by resource management agencies, including the Oregon Department of Fish and Wildlife, to utilize existing corridors to the extent possible to minimize impacts.

The natural gas pipeline is not considered to be an energy facility because it is less than 5 miles long, ORS 469.300(11)(E)(ii). The natural gas pipeline could also meet the intent of the exclusion of subsection (E)(ii)(II), since the line will be placed primarily within the existing HGP natural gas pipeline ROW and the existing gas line was included in the site certificate issued to the HGP.

B.6 TRANSMISSION LINE AND PIPELINE

OAR 345-021-0010(1)(b)(E) *For any pipeline or transmission line, regardless of size:*

(i) The length of the pipeline or transmission line.

(ii) The proposed right-of-way width of the pipeline or transmission line, including to what extent new right-of-way will be required or existing right-of-way will be widened.

(iii) If the proposed corridor follows or includes public right-of-way, a description of where the facility would be located within the public right-of-way, to the extent known. If the applicant proposes to locate all or part of a pipeline or transmission line adjacent to but not within the public right-of-way, describe the reasons for locating the facility outside the public right-of-way. The applicant must include a set of clear and objective criteria and a description of the type of evidence that would support locating the facility outside the public right-of-way, based on those criteria.

(iv) For pipelines, the operating pressure and delivery capacity in thousand cubic feet per day and the diameter and location, above or below ground, of each pipeline.

(v) For transmission lines, the rated voltage, load carrying capacity, and type of current and a description of transmission line structures and their dimensions.

Response: The new natural gas pipeline to supply the Station will be approximately 4.63 miles in length and will be owned and operated by CNG. The new pipeline will be entirely within the already established ROW of the HGP's gas pipeline. This interconnecting lateral will be approximately 12 to 18 inches in diameter. The operating pressure of the pipeline is expected to range from 680 to 750 psig and supply a minimum of 89,300 thousand standard cubic feet per day, assuming a 24-hour operation at full load.

The complete routing (length and ROW use) of the transmission line is described in detail in Section B.4, above. The line will have a load carrying capacity of approximately 997 amps (approximately 417 mega volt ampere) and will be designed to the 230-kV line design standards of the National Electric Safety Code. A description of the various transmission line structures and their dimensions are also provided in Section B.4, above.

B.7 CONSTRUCTION SCHEDULE

OAR 345-021-0010(1)(b)(F) *A construction schedule including the date by which the applicant proposes to begin construction and the date by which the applicant proposes to complete construction. Construction is defined in OAR 345-001-0010. The applicant shall describe in this* *exhibit all work on the site that the applicant intends to begin before the Council issues a site certificate. The applicant shall include an estimate of the cost of that work. For the purpose of this exhibit, "work on the site" means any work within a site or corridor, other than surveying, exploration or other activities to define or characterize the site or corridor that the applicant anticipates or has performed as of the time of submitting the application.*

<u>Response</u>: Total construction duration for the Station is expected to be 22 months, from mobilization to commencement of commercial operation. The first construction contractor is expected to be mobilized onsite in the third quarter of 2015. The first two months of construction activities will comprise site preparation and grading work. Then, construction for Unit 1 through Unit 4 will continue for the next 16 months until the units are ready to be commissioned in the first quarter of 2017. Therefore, the majority of the impact from construction activities, such as traffic, noise, and demand for public service from nearby communities, will occur during this 16-month period when construction is at its peak. Startup, testing, and commissioning will occur for another four months before the Station is ready to be placed into commercial operation. Site survey and geotechnical investigation may take place on the Site prior to receiving site certificate, but no construction activities are expected to begin before July 2015.

An engineering, procurement, and construction (EPC) contractor will be selected in January 2015, with the contract for combustion turbine generators expected to be awarded by March 2015. The Station will commence commercial operation in the second quarter of 2017 under this schedule. The transmission line and natural gas pipeline construction will follow the same schedule.

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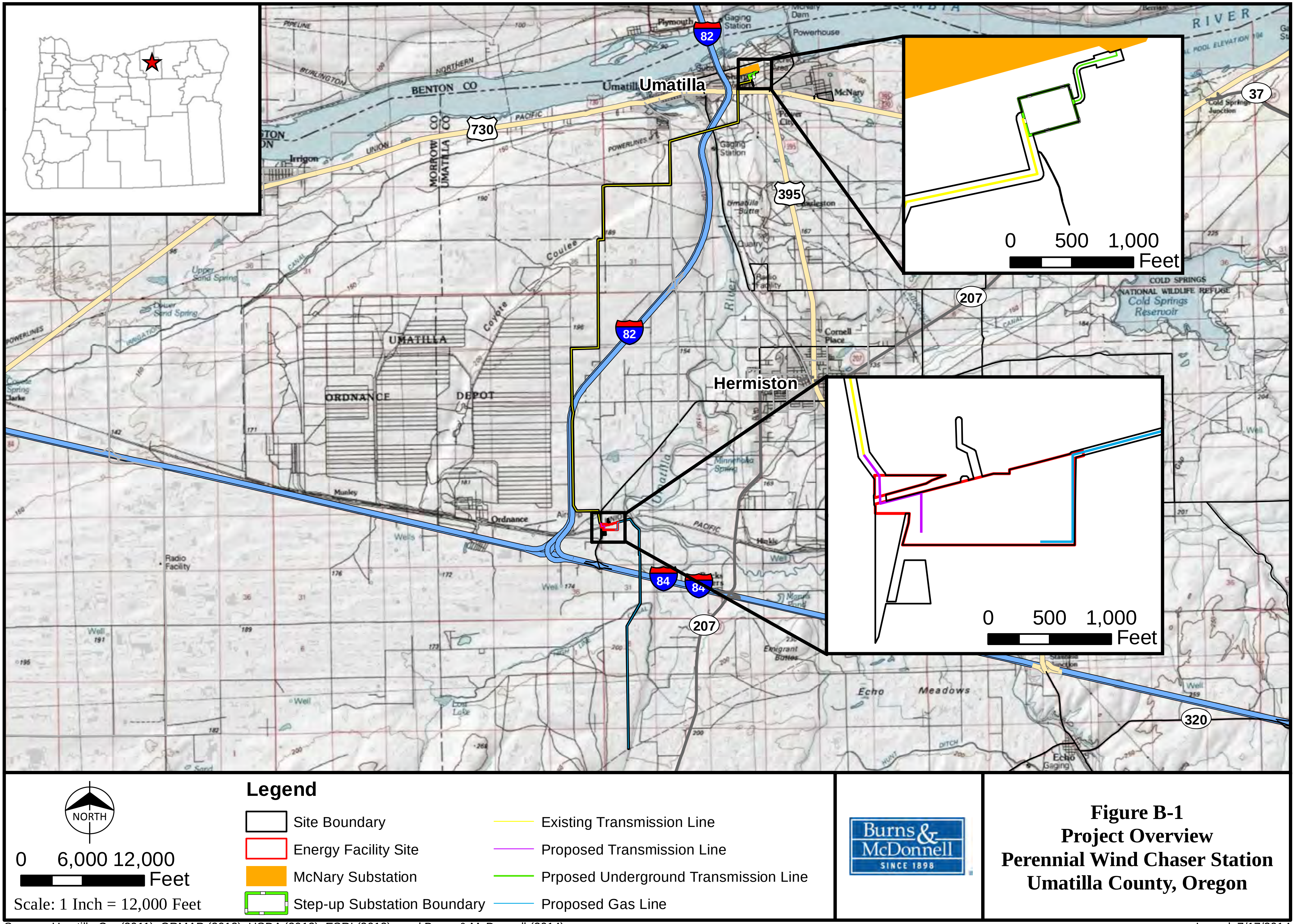
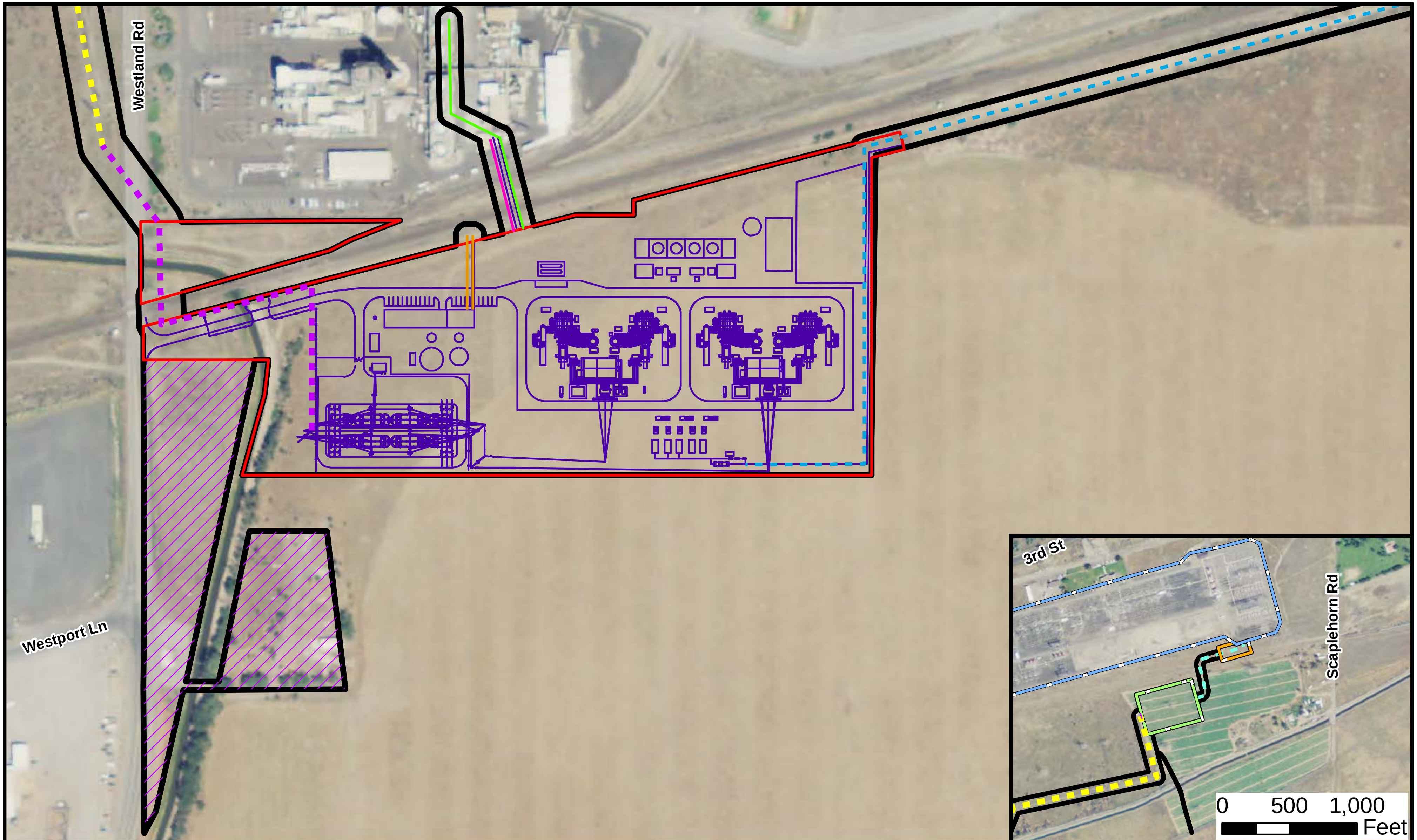


Figure B-1
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014



NORTH

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Feet
Scale: 1 Inch = 300 Feet

Legend

- Site Boundary
- Energy Facility Site
- Step-up Substation Boundary
- McNary Substation
- Proposed Riser Structure Fenced Area
- Proposed Process Water Interconnect
- Proposed Reclaimed Water Interconnect
- Existing Transmission Line
- Proposed Transmission Line
- Proposed Underground Transmission Line
- Proposed Gas Line
- Proposed Utility Line
- Temporary Construction Area

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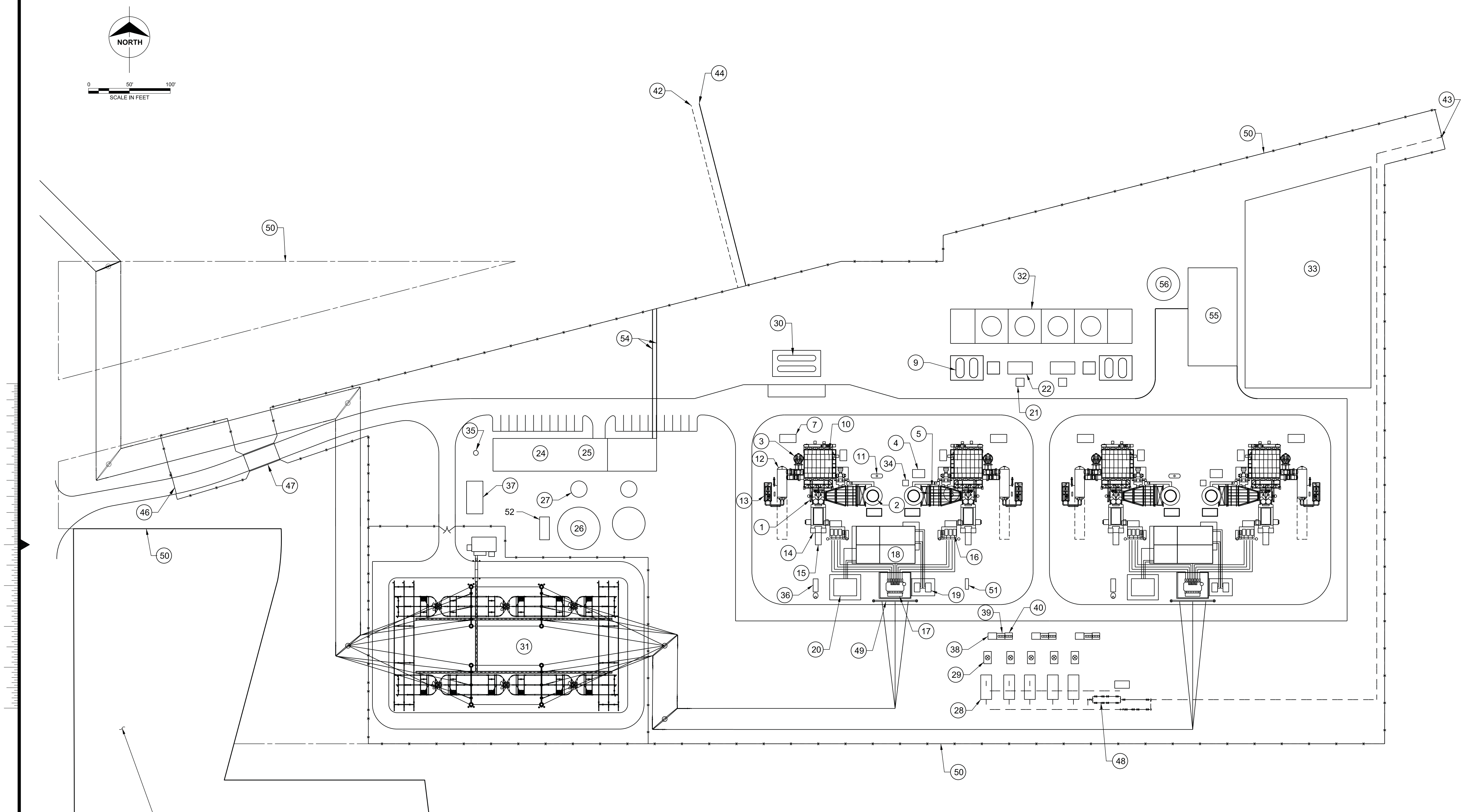
Figure B-2
Site Plan Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

Issued: 7/18/2014



KEY NOTES:

1. LMS100 CTG
2. STACK EXHAUST
3. VBV STACK
4. CEMS
5. SCR
6. SCR AMMONIA INJECTION SKID
7. FUEL GAS FILTER SEPARATOR
8. NOT USED
9. CHEMICAL FEED SKID
10. CTG INLET AIR FILTER
11. WATER WASH SUMP/TANK
12. INTERCOOLER
13. COOLING WATER PUMP SKID
14. GENERATOR
15. GENERATOR PULL SPACE
16. 13.8KV GENERATOR CIRCUIT BREAKER
17. GENERATOR STEP-UP 3-WINDING TRANSFORMER (230KV-13.8KV)
18. TURBINE CONTROL & MAIN POWER DIST CENTER
19. SECONDARY UNIT SUBSTATION TRANS (4.16KV-480V)
20. UNIT AUXILIARY TRANSFORMER (13.8KV-4.16KV)
21. COOLING TOWER TRANSFORMER
22. COOLING TOWER POWER DISTRIBUTION CENTER (PDC)
23. TEMPORARY CONSTRUCTION AREA
24. CONTROL/ADMIN BUILDING
25. WATER TREATMENT
26. RAW WATER TANK
27. DEMINERALIZED WATER TANK
28. GAS COMPRESSOR
29. GAS COMPRESSOR LUBE OIL SKID
30. AMMONIA (29% AQUEOUS) STORAGE AND FORWARDING
31. 230KV SWITCHYARD
32. COOLING TOWER
33. STORMWATER DETENTION BASIN
34. WASTE WATER SUMP
35. SANITARY LIFT STATION
36. OIL WATER SEPARATOR
37. SEPTIC TANK AND LATERAL FIELD
38. GAS COMPRESSOR TRANSFORMER
39. 5KV DISTRIBUTION PANEL
40. GAS COMPRESSOR MCC
41. NOT USED
42. PROCESS WATER INTERCONNECT
43. NATURAL GAS INTERCONNECT
44. WASTE WATER INTERCONNECT
45. NOT USED
46. MOTOR-OPERATED SLIDE GATE
47. ENTRANCE ROAD BRIDGE
48. GAS METERING
49. SWITCHYARD GSU TIE UNITS 1 & 2
50. PROPERTY LINE
51. EMERGENCY DIESEL GENERATOR
52. DIESEL FIRE PUMP
53. NOT USED
54. UTILITY/COMMUNICATIONS LINES
55. ZERO LIQUID DISCHARGE (POTENTIAL ALTERNATIVE)
56. ZLD WATER STORAGE TANK

no.	date	by	ckd	description

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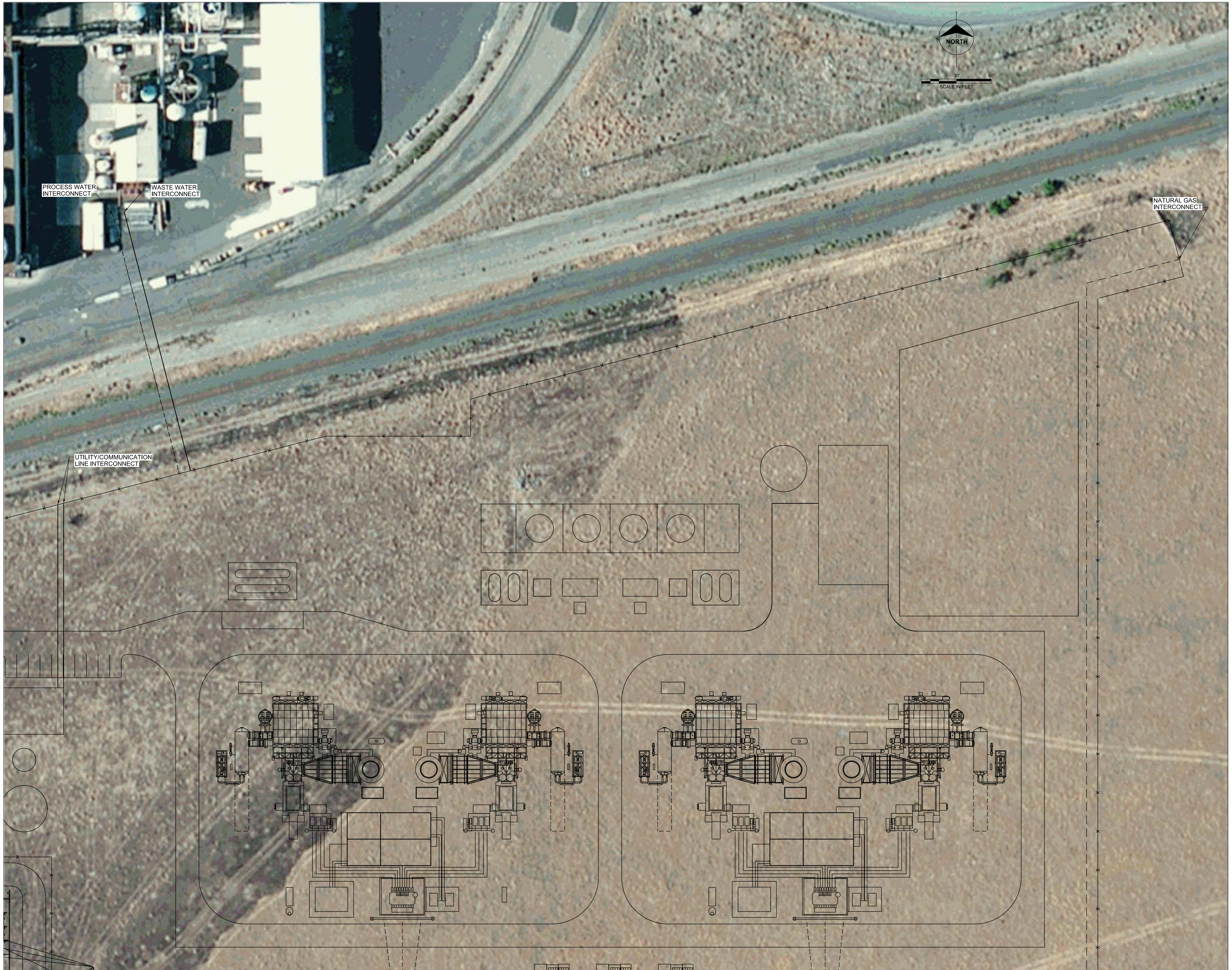
date AUGUST 6, 2013	detailed R. SEDLACEK
designed R. SEDLACEK	checked

PERENNIAL WIND CHASER STATION

UMATILLA COUNTY, OREGON

DETAILED FACILITY SITE PLAN

project 55745	contract
drawing **FIGURE B-3**	rev.
sheet	of	sheets
file	



no.	date	by	ckd	description

Burns & McDonnell SINCE 1898

date AUGUST 6, 2013
detailed R. SEDLACEK
designed R. SEDLACEK
checked

PERENNIAL WIND CHASER STATION

UMATILLA COUNTY, OREGON

UTILITY INTERCONNECTS

project
contract
drawing
rev.

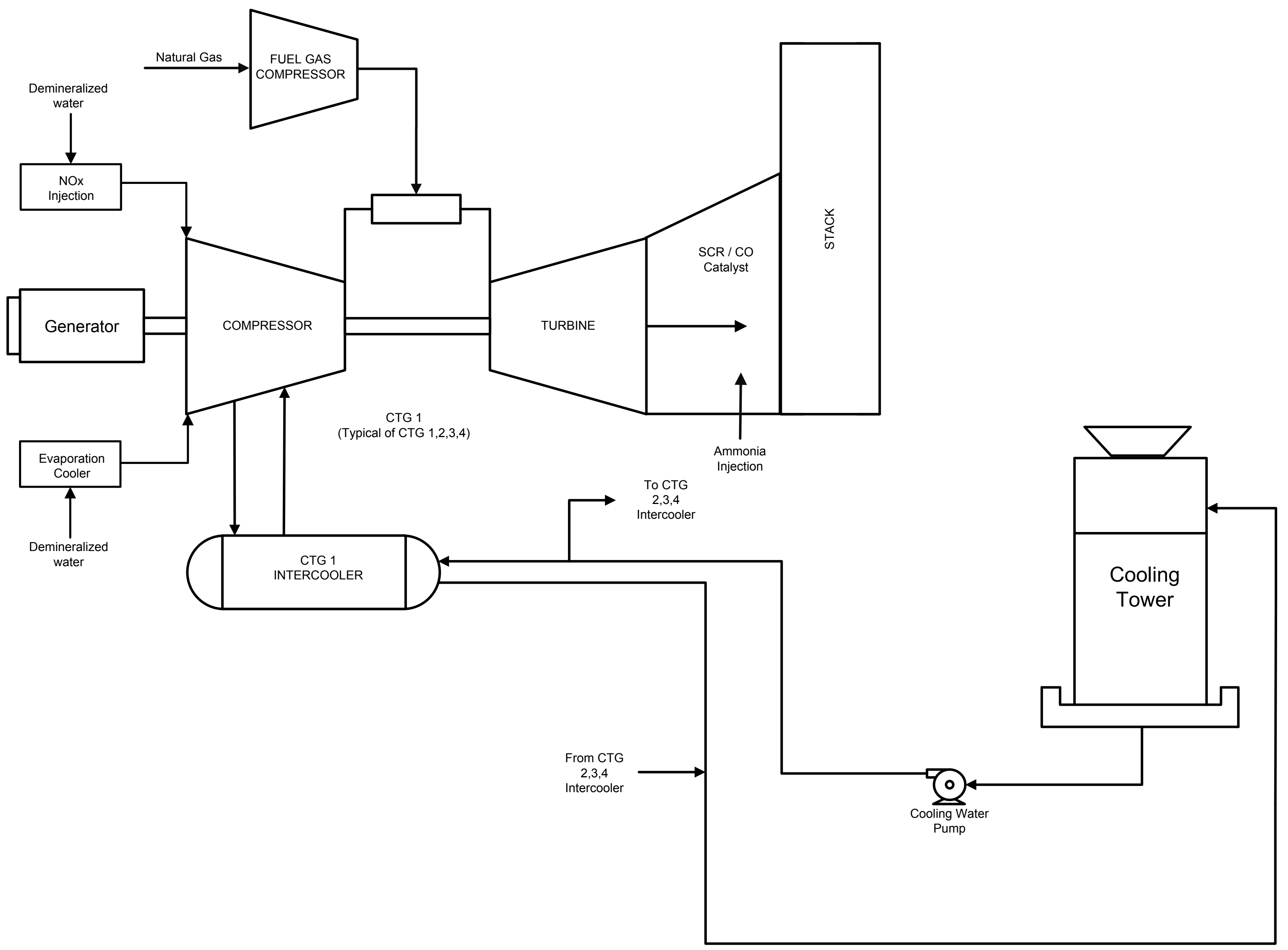
FIGURE B-4

sheet of sheets
file

Scale For Microfilming
Millimeters
Inches

PRELIMINARY, NOT FOR GUARANTEE

Diagram is for graphical representation purposes only. Actual equipment arrangement may vary. Not to be used for construction.



REV.	NOTES:	DATE
0	Issued for Application for Site Certificate	4/2/2013

Perennial Wind Chaser Station, Umatilla County, Oregon
4x LMS100 Simple Cycle

Date 4/2/2013	Detailed K. Sandven
Designed	Checked C. Kinsella

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Figure B-5: Process Flow Diagram

Project Perennial Wind Chaser Station

Drawing Figure B-5 Rev **0**

Sheet 1 of Sheet 1

EXHIBIT C

LOCATION
OAR 345-021-0010(1)(c)

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

C.1 INTRODUCTION

OAR 345-021-0010(1)(c) *Information about the location of the proposed facility.*

Response: The proposed Perennial Wind Chaser Station project (Project) will be located in Umatilla County next to the Hermiston Generating Plant (HGP).

C.2 MAPS

OAR 345-021-0010(1)(c)(A) *A map or maps showing the proposed locations of the energy facility site, all related or supporting facility sites and all areas that might be temporarily disturbed during construction of the facility in relation to major roads, water bodies, cities and towns, important landmarks and topographic features, using a scale of 1 inch = 2,000 feet or smaller when necessary to show detail.*

Response: Maps of the proposed Project location are provided at the end of this exhibit. Figure C-1 shows, at a regional scale, the locations of the various components of the proposed Project, which includes the Perennial Wind Chaser Station (Station) and its associated transmission line and natural gas pipeline; this figure also shows the Project's location in relationship to Interstate Highways 82 and 84. Figure C-2 shows a site plan overview, the proposed location of the Station, all related or supporting facilities near the Station and near the step-up substation, and all areas that could be temporarily disturbed during construction of the Project. Figure C-3 shows a detailed facility site plan of the Station. Figures C-4 through C-7 show the transmission line right-of-way (ROW), along with the associated topography. Figures C-7 through C-9 show the natural gas pipeline ROW.

C.3 LOCATION DESCRIPTION

OAR 345-021-0010(1)(c)(B) *A description of the location of the proposed energy facility site, the proposed site of each related or supporting facility and areas of temporary disturbance, including the total land area (in acres) within the proposed site boundary, the total area of permanent disturbance, and the total area of temporary disturbance. If a proposed pipeline or transmission line is to follow an existing road, pipeline, or transmission line, the applicant shall state to which side of the existing road, pipeline, or transmission line the proposed facility will run, to the extent this is known.*

Response: See Appendix C-1: Land Description for the Perennial Wind Chaser Station Facility Site.

C.3.1 Site Boundary

The overall Site Boundary for the Project is defined as the perimeter of the Energy Facility Site (which includes the Station, switchyard, and temporary laydown area, as defined in Section C.3.2), in addition to the transmission line ROW and natural gas pipeline ROW. Overall, approximately 60 acres are associated with the Project, including about 23 acres permanently impacted and approximately 37 acres temporarily impacted by the Project. The Energy Facility Site is located approximately 5 miles southwest of Hermiston, Oregon, adjacent to the existing HGP, in Township 4 North, Range 28 East, Willamette Meridian. From the Station, the supporting natural gas pipeline is routed south 4.63 miles, and the transmission line is routed north 11.59 miles.

C.3.2 Energy Facility Site

The proposed Energy Facility Site includes the following:

- Station, including building, structures, and stormwater pond on approximately 19.97 acres of land in two portions. Figure C-3 provides a layout of equipment and structures on the Energy Facility Site. The southern portion will be completely fenced.
- Onsite switchyard, to occupy approximately 2 acres within a fenced enclosure at the southwest corner of the Energy Facility Site.

The entire 19.97 acres associated with the Energy Facility Site is expected to be permanently impacted by the Project. During construction, undeveloped areas of the Energy Facility Site will be used as laydown areas. The land is currently owned by Liberated L&E LLC; Perennial-WindChaser LLC (Perennial) has an option to purchase the site from the owner.

C.3.3 Transmission Line

Power generated at the Station will be transmitted to the Bonneville Power Administration (BPA) McNary Substation via the existing transmission infrastructure that runs from Hermiston to McNary, currently supporting both a 115-kilovolt (kV) and a 230-kV electric transmission line. The 115-kV line will be replaced with a new 230-kV line. Utilization of this existing transmission infrastructure involves five distinct phases:

- Initial tie-in,
- Reconductoring the existing line,
- Tie-in to a new step-up substation,
- Development of the new step-up substation, and
- Tie-in of the new step-up substation to the McNary Substation.

Each phase is described in detail below. The transmission line is located in Umatilla County.

C.3.3.1 Initial Tie-In

From the onsite switchyard in southwest corner of the Energy Facility Site (within fence line), it is expected that the installation of four new towers or poles will be necessary to reach the Energy Facility Site boundary at the site's northwestern corner. From the northwest corner of the Energy Facility Site, the transmission line will then cross Westland Road to a new pole on the western side of Westland Road. This fifth new pole will connect with the existing structures of the Hermiston to McNary line. The first connecting pole of the existing line may need to be replaced with a new pole or otherwise modified. If this pole is replaced, there will be a total of six new transmission poles required for the Project (otherwise only five new poles). Both proposed and existing transmission poles are identified in Figure C-7. Note that the northernmost proposed new tower in Figure C-7 is the existing pole that might need to be replaced or otherwise modified.

The Umatilla Electric Cooperative (UEC) has existing ROWs for the western side of the road. Assuming that two new poles will be necessary on the west side of Westland Road (i.e., one existing pole will need to be replaced), about 0.46 acres of land will be temporarily disturbed during this installation. A new ROW (aboveground) is expected to be necessary across Westland Road to connect the new transmission line from the northwest corner of the Station to the first proposed new pole on the west side of Westland Road. The distance from the boundary at the northwest corner of the Energy Facility Site to the first new connecting pole on the west side of Westland Road is 215 feet. The new 215-foot-long ROW associated with the initial tie-in for the Project will be 100 feet wide; however, any ground disturbances associated with the installation of these two poles, across the road from one another, will occur either within the boundary of the Energy Facility Site, or in the existing UEC ROW (included in 0.46-acre estimate above). Disturbances associated with the four new poles located in the Energy Facility Site are considered permanent impacts and are grouped with the disturbance acres for the site as a whole.

Temporary disturbances associated with the installation of up to two new poles on the west side of Westland Road would occur due to the presence of the machinery required for transmission pole and transmission line installation, including utility company boom trucks, an auger for drilling holes, and a concrete truck for pouring transmission pole foundations. Other than augering for the new pole foundations, no excavating would occur. Most other potential disturbances would result from vehicles and equipment driving on vegetation at and between tower sites.

C.3.3.2 Reconductoring the Existing Line

The existing 115-kV line on the Hermiston to McNary transmission structures will be restrung with new 230-kV line for the Station. The existing 115-kV portion of the line is owned and used by the UEC. It is expected that the UEC will need to remove and replace this line. This activity is outside of the scope of this application. This portion of the transmission line will be approximately 11.59 miles long and will stay within the existing UEC ROW portion of the Hermiston line. This transmission line corridor primarily passes through land zoned for exclusive farm use, with a short distance passing through a suburban area in the City of Umatilla. The existing structures were designed to route two 230-kV lines. No new poles are expected to be necessary for this portion of the line. An existing road system follows the transmission line. Utility boom trucks and trucks equipped with platform cranes will be used to remove the existing lines and replace them with new lines. No excavating or grading would occur during reconductoring. Potential disturbances would result primarily from vehicles and equipment driving on vegetation at stringing sites. It is estimated that 12 stringing locations will be required for the reconductoring effort. Each stringing location will be contained within the existing transmission ROW and will measure approximately 50 by 100 feet, for a total of 60,000 square feet, or approximately 1.38 acres of temporary disturbance. Exact stringing locations and equipment requirements will be determined during the advanced Project planning stage. Activities at these sites will be low-impact, consisting primarily of vehicles driving on low-growing vegetation. No excavation, grading, or other soil disturbance will occur at these sites. Crews will be restricted to existing unpaved access roads, including two-track roads in some cases, to access work sites along this corridor.

C.3.3.3 Tie-In to New Step-Up Substation

Just before the existing transmission line enters the McNary Substation, the Station's 230-kV lines will be routed to a new step-up substation. The distance of this tie-in is estimated to be about 11 feet. The land is owned by BPA, and BPA has conditionally approved the use of their land for theses tie-in activities. The ROW associated with the tie-in to the new step-up substation will be 100 feet wide and account for 0.03 acres of temporary disturbance. No new poles will be associated with the tie-in.

C.3.3.4 Development of New Step-Up Substation

In order to tie in to the open bay at the McNary Substation, the voltage of the transmission line must be stepped up from 230 kV to 500 kV. The proposed step-up substation will be sited on approximately 3 acres of land and will include the following:

- Tie-in structure (discussed above).
- 500-kV substation, including the step-up transformers and associated disconnect switches and circuit breakers. Figure C-4 provides a preliminary layout of equipment and structures on the substation site.
- Underground termination structures, where the aboveground transmission line transitions into an underground cable.
- An existing dirt road from Brownell Ditch Road that services the transmission line, about 800 feet long and about 12 feet wide, will be utilized to service the substation as well. It is proposed that gravel will be added to the surface to upgrade the road for the length to the substation. Approximately 0.22 acres of land will be temporarily disturbed by this activity.

The land associated with the new step-up substation is owned by BPA, which has conditionally approved the use of its land for this purpose. The entire 3 acres of the substation (excluding the road) is expected to be permanently impacted by the Project.

C.3.3.5 Tie-In of New Step-Up Substation to McNary Substation

Approximately 477 feet of underground cable route (a temporary disturbance of about 0.55 acres) connects the 500-kV step-up substation to the termination structure (risers). The underground cable crosses lands managed by the United States Army Corps of Engineers (USACE). The riser termination structures are also on USACE lands. Perennial will be required to obtain approval of a ROW from the USACE. The riser termination structure will bring the underground line into the McNary Substation. An area of 0.51 acre is expected to be permanently impacted due to the fenced-in riser termination structure associated with the tie-in of the new step-up substation to the McNary Substation.

C.3.4 Natural Gas Pipeline Lateral

A natural gas pipeline lateral will also be constructed to provide fuel for the Station. This lateral, to be owned and operated by Cascade Natural Gas Corporation (CNG), will bring natural gas to the Energy Facility Site from an existing pipeline owned by Gas Transmission Northwest (GTN). The natural gas pipeline lateral will tap the GTN pipeline approximately 4.63 miles south of the Energy Facility Site and will be approximately 12 to 18 inches in diameter. The new pipeline will be located within the established 50-foot-wide ROW associated with the HGP gas pipeline. It is estimated that about 28.06 acres will be temporarily impacted by the natural gas pipeline portion of the Project. The natural gas pipeline will extend to the area of an existing meter station situated next to the main GTN natural gas pipeline. New metering equipment will be added within the footprint of the existing metering station servicing the HGP. Modifications at the meter station will be conducted by GTN under its blanket Federal Energy Regulatory Commission agreement and connect the lateral to the main pipeline operated by GTN. The meter station is owned by GTN but operated by CNG. Thus, the meter station is not considered part of the Project.

C.3.5 Miscellaneous Temporary Disturbed Areas

The Project includes the following temporary disturbed areas:

- Temporary laydown area of 5.11 acres adjacent to the Energy Facility Site. This land is owned by Hermiston Generating Company and PacifiCorp.
- Underground process water line. This line will need to go under the railroad track, and 0.24 acres (208 feet by 50 feet) are estimated to be disturbed.
- Underground reclaimed water line. This line will need to go under the railroad track, and 0.62 acres (538 feet by 50 feet) are estimated to be disturbed.

C.4 AREAS OF PROJECT DISTURBANCES

Table C-1 presents a summary for the areas of permanent disturbances.

Table C-1 Summary of Areas of Permanent Disturbances

Project Permanent Disturbances	Acres
Energy Facility Site	19.97
Step-up Substation	3.0
Risers within McNary Substation/USACE lands	0.51
Total	**23.48**

C.5 AREAS OF TEMPORARY DISTURBANCE

Table C-2 presents a summary for the areas of temporary disturbances.

Table C-2 Summary of Areas of Temporary Disturbance

Temporarily Disturbed Areas	Acres
Initial tie-in Transmission Poles (two)	0.46
Underground 500-kV Cable	0.55
Underground Natural Gas Line	28.06
Construction Laydown and Parking (not including area on Project site)	5.11
Underground Process Water Line	0.24

Table C-2 Summary of Areas of Temporary Disturbance

Temporarily Disturbed Areas	Acres
Underground Reclaimed Water Line	0.62
T-Line Reconductoring	1.38
T-Line Tie-in to Substation (100 x 11 feet)	0.03
Step-up Substation Road Upgrade	0.22
Total	**36.67**

Key:
kV kilovolt

C.6 SITE BOUNDARY AREA

Table C-3 presents a summary for the Site Boundary Area.

Table C-3 Summary of Site Boundary Area

Site Boundary Area	Acres
Project Facilities	23.48
Temporary Disturbed Areas	36.67
Total	**60.15**

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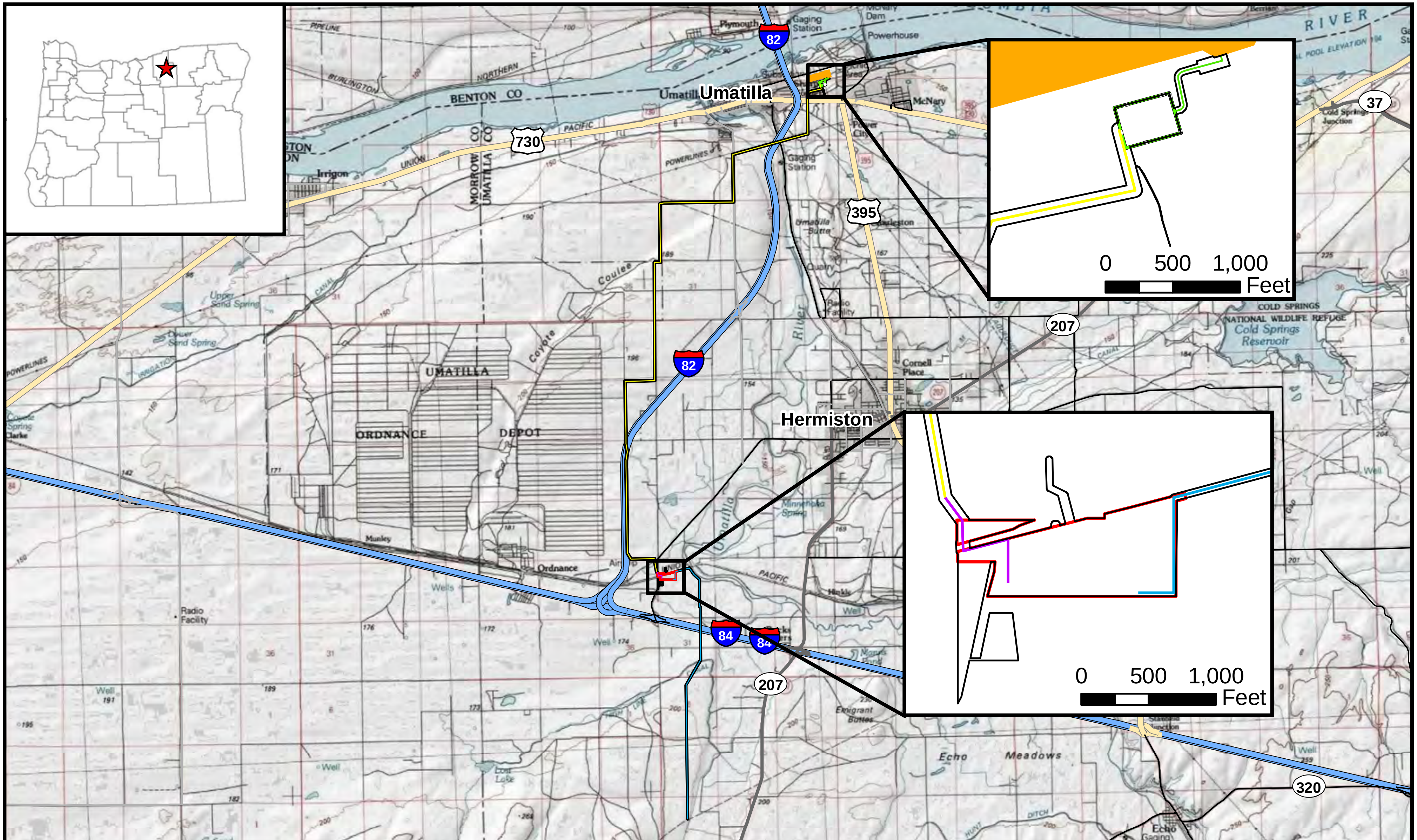

NORTH

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Feet

Scale: 1 Inch = 12,000 Feet

Legend

- Site Boundary
- Energy Facility Site
- McNary Substation
- Step-up Substation Boundary
- Existing Transmission Line
- Proposed Transmission Line
- Prposed Underground Transmission Line
- Proposed Gas Line

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Figure C-1
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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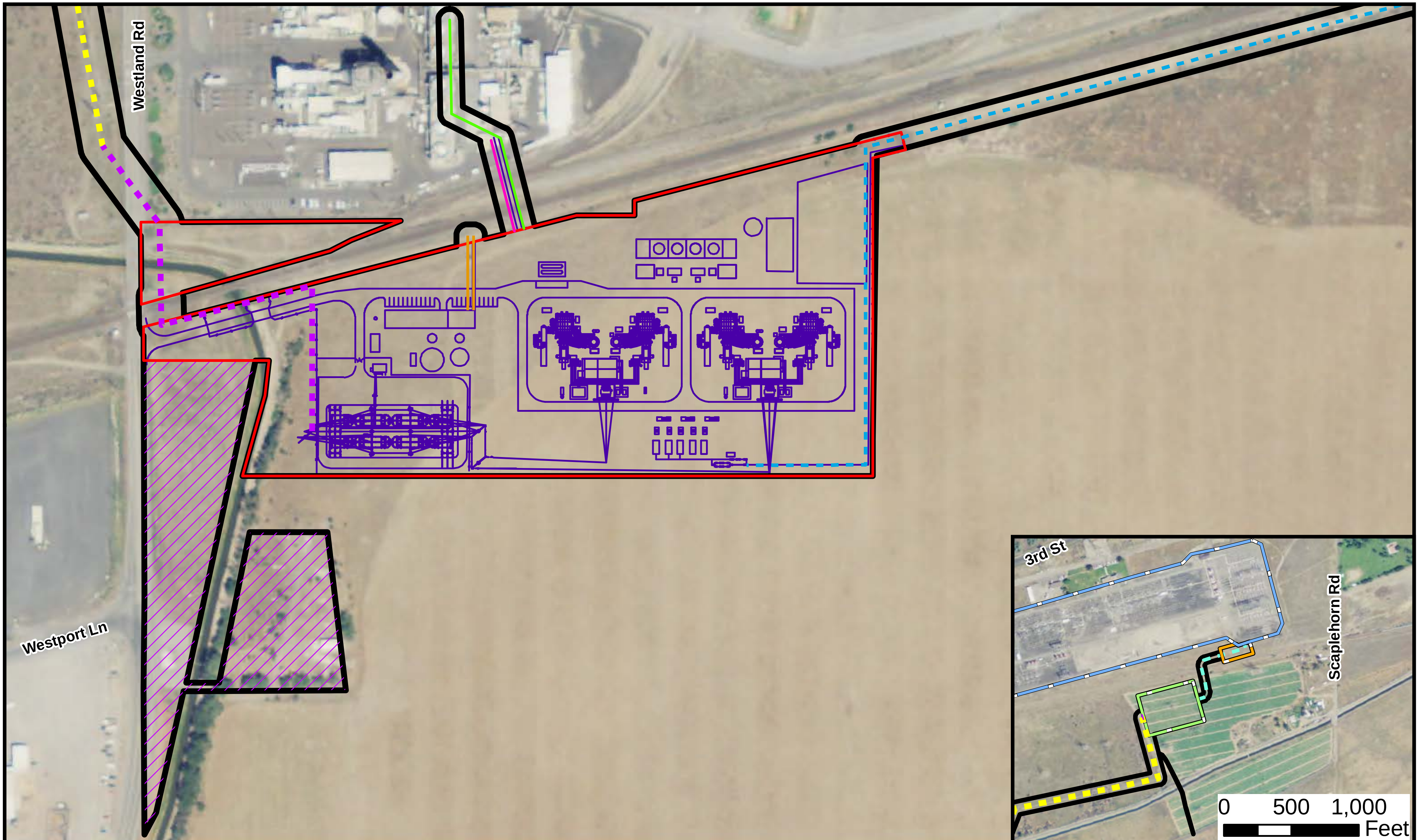

NORTH

0 150 300
Feet

Scale: 1 Inch = 300 Feet

Legend

- Site Boundary
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- Proposed Utility Line
- Temporary Construction Area

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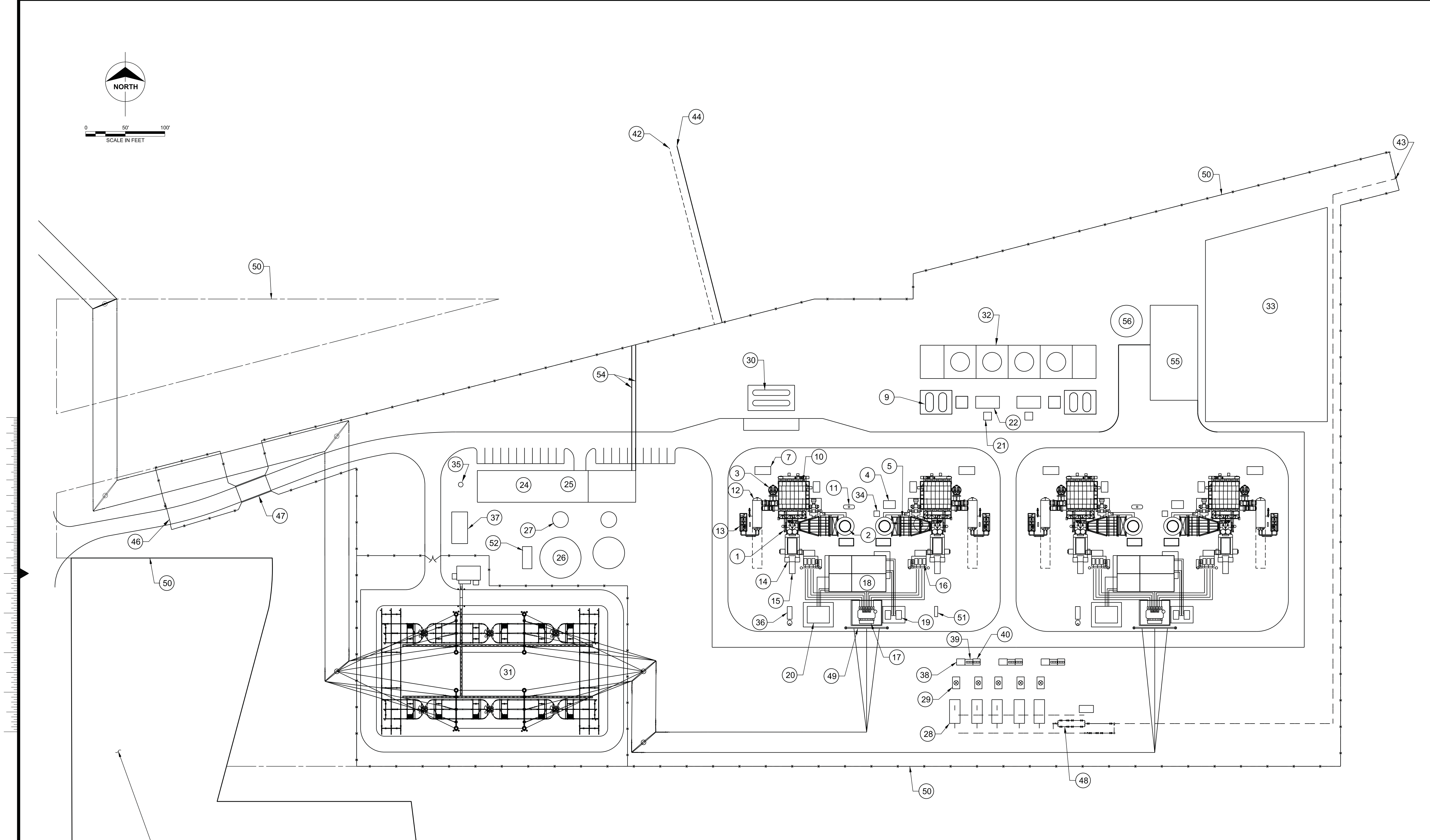
Figure C-2
Site Plan Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

Issued: 7/23/2014



KEY NOTES:

1 LMS100 CTG
2 STACK EXHAUST
3 VBV STACK
4 CEMS
5 SCR
6 SCR AMMONIA INJECTION SKID
7 FUEL GAS FILTER SEPARATOR
8 NOT USED
9 CHEMICAL FEED SKID
10 CTG INLET AIR FILTER
11 WATER WASH SUMP/TANK
12 INTERCOOLER
13 COOLING WATER PUMP SKID
14 GENERATOR
15 GENERATOR PULL SPACE
16 13.8KV GENERATOR CIRCUIT BREAKER
17 GENERATOR STEP-UP 3-WINDING TRANSFORMER (230KV-13.8KV)
18 TURBINE CONTROL & MAIN POWER DIST CENTER
19 SECONDARY UNIT SUBSTATION TRANS (4.16KV-480V)
20 UNIT AUXILIARY TRANSFORMER (13.8KV-4.16KV)
21 COOLING TOWER TRANSFORMER
22 COOLING TOWER POWER DISTRIBUTION CENTER (PDC)
23 TEMPORARY CONSTRUCTION AREA
24 CONTROL/ADMIN BUILDING
25 WATER TREATMENT
26 RAW WATER TANK
27 DEMINERALIZED WATER TANK
28 GAS COMPRESSOR
29 GAS COMPRESSOR LUBE OIL SKID
30 AMMONIA (29% AQUEOUS) STORAGE AND FORWARDING
31 230KV SWITCHYARD
32 COOLING TOWER
33 STORMWATER DETENTION BASIN
34 WASTE WATER SUMP
35 SANITARY LIFT STATION
36 OIL WATER SEPARATOR
37 SEPTIC TANK AND LATERAL FIELD
38 GAS COMPRESSOR TRANSFORMER
39 5KV DISTRIBUTION PANEL
40 GAS COMPRESSOR MCC
41 NOT USED
42 PROCESS WATER INTERCONNECT
43 NATURAL GAS INTERCONNECT
44 WASTE WATER INTERCONNECT
45 NOT USED
46 MOTOR-OPERATED SLIDE GATE
47 ENTRANCE ROAD BRIDGE
48 GAS METERING
49 SWITCHYARD GSU TIE UNITS 1 & 2
50 PROPERTY LINE
51 EMERGENCY DIESEL GENERATOR
52 DIESEL FIRE PUMP
53 NOT USED
54 UTILITY/COMMUNICATIONS LINES
55 ZERO LIQUID DISCHARGE (POTENTIAL ALTERNATIVE)
56 ZLD WATER STORAGE TANK

no.	date	by	ckd	description

Burns & McDonnell SINCE 1898

date: AUGUST 6, 2013
detailed: R. SEDLACEK
designed: R. SEDLACEK
checked:

PERENNIAL WIND CHASER STATION

UMATILLA COUNTY, OREGON

DETAILED FACILITY SITE PLAN

project | contract

drawing: **FIGURE C-3** rev.

sheet of sheets

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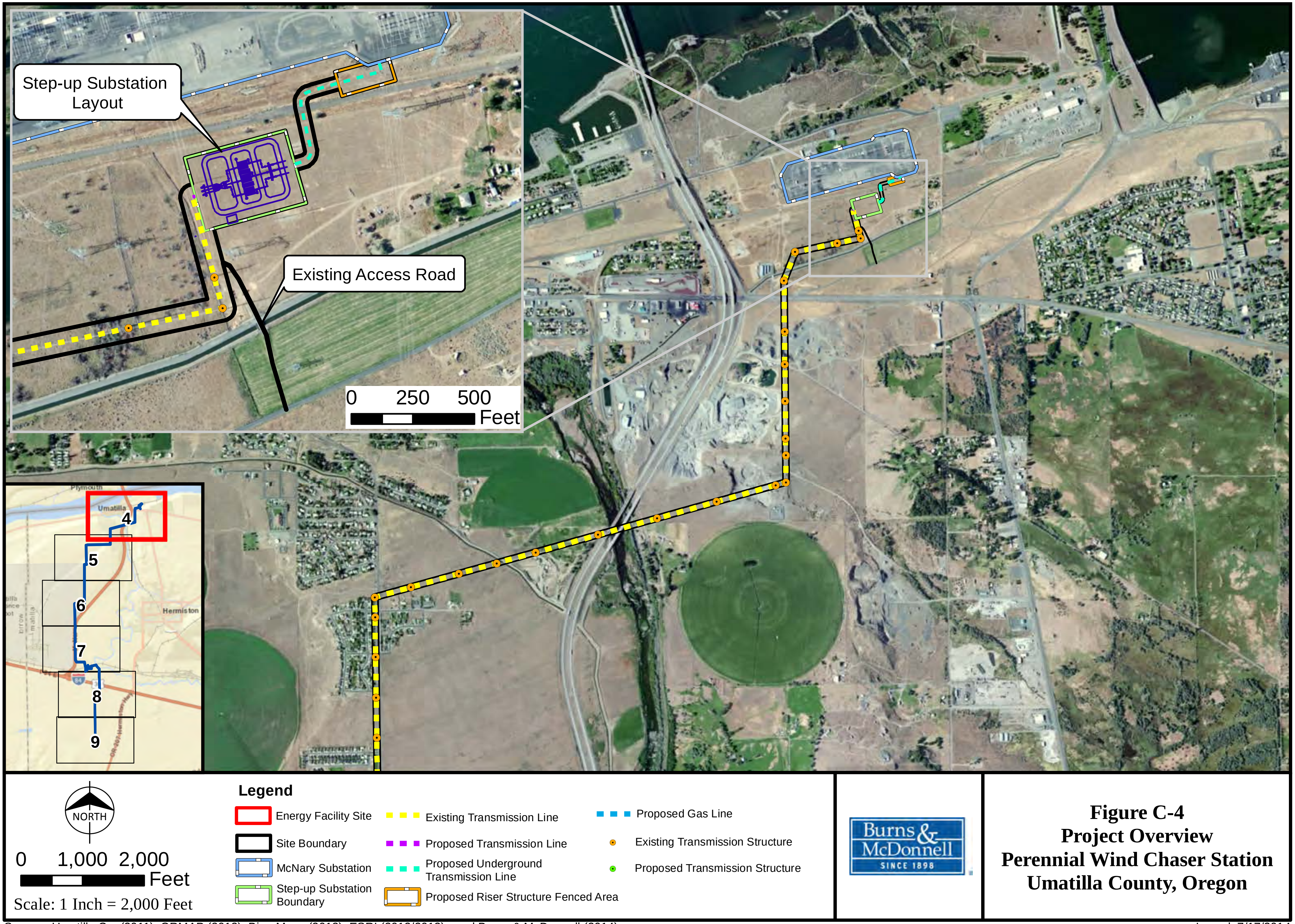

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Figure C-4
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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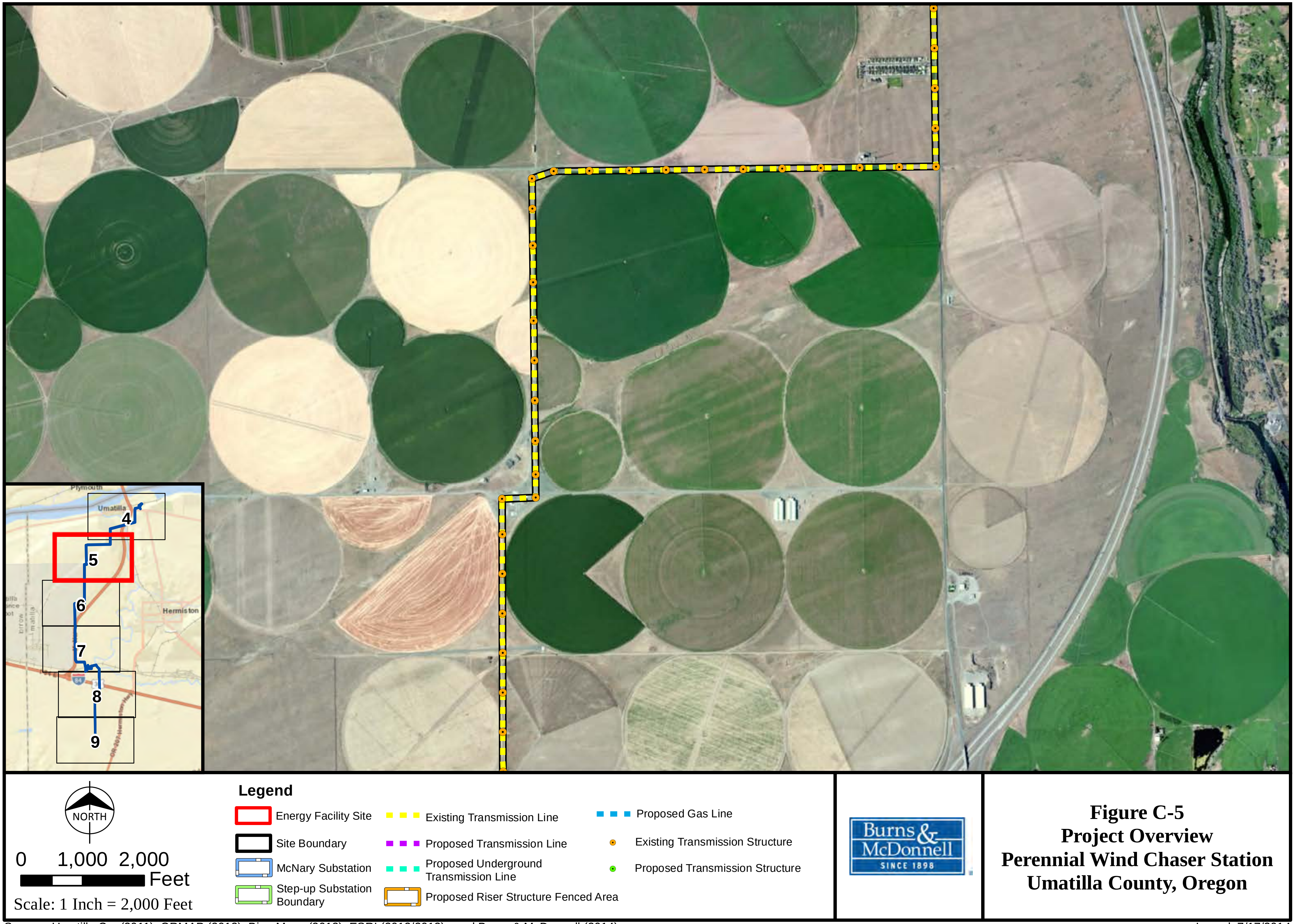

Figure C-5
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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NORTH

0 1,000 2,000 Feet

Scale: 1 Inch = 2,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Existing Transmission Line
- Proposed Transmission Line
- Proposed Underground Transmission Line
- Proposed Riser Structure Fenced Area
- Proposed Gas Line
- Existing Transmission Structure
- Proposed Transmission Structure

Burns & McDonnell SINCE 1898

Figure C-6
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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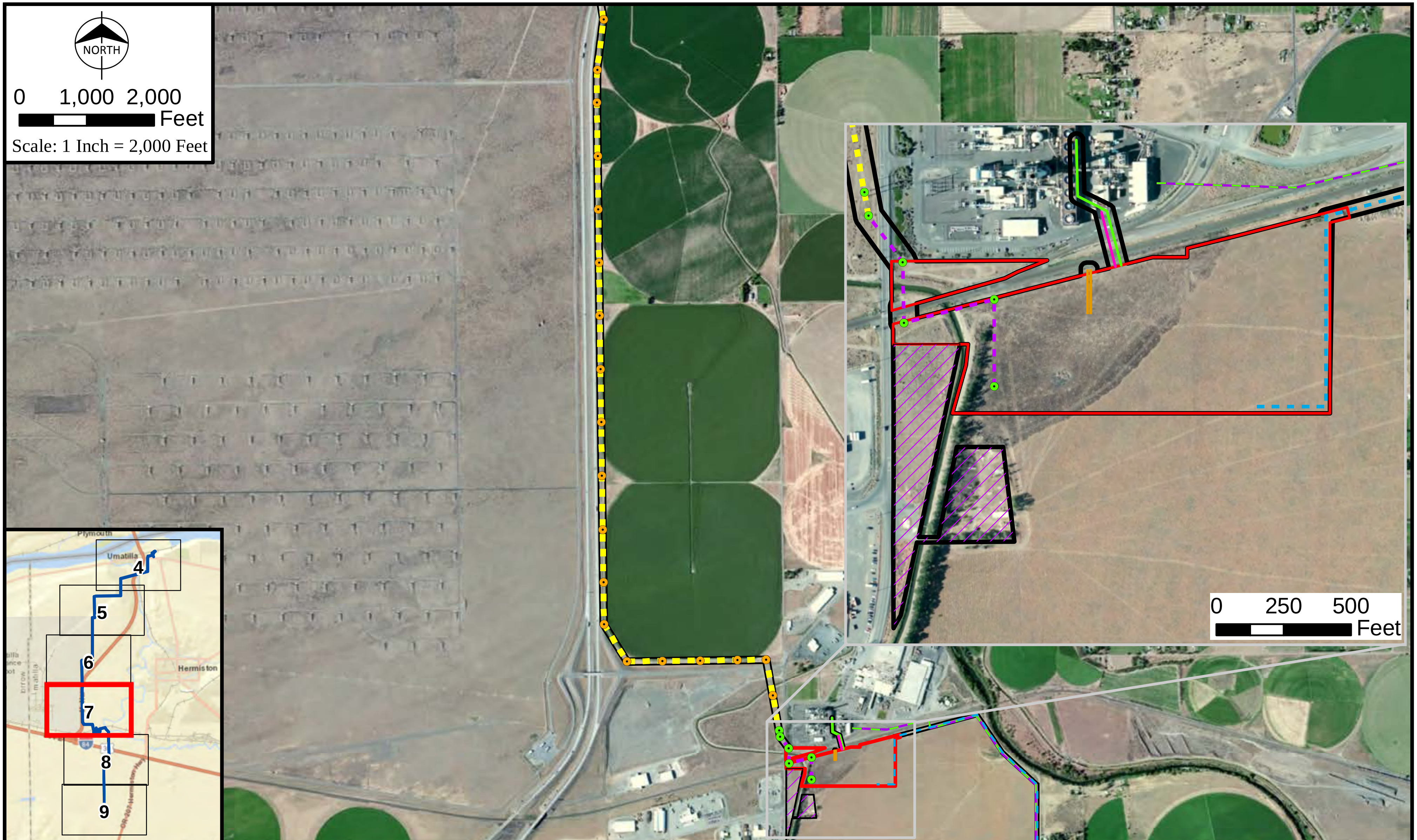

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Temporary Construction Area
- Proposed Riser Structure Fenced Area
- Existing Transmission Structure
- Proposed Transmission Structure
- Existing Transmission Line
- Proposed Transmission Line
- Proposed Gas Line
- Proposed Underground Transmission Line
- Proposed Utility Line
- Proposed Process Water Interconnect
- Proposed Reclaimed Water Interconnect
- Existing Cascade Gasline (Approximate Location)
- Existing GTN Gasline (Approximate Location)

Burns & McDonnell SINCE 1898

Figure C-7
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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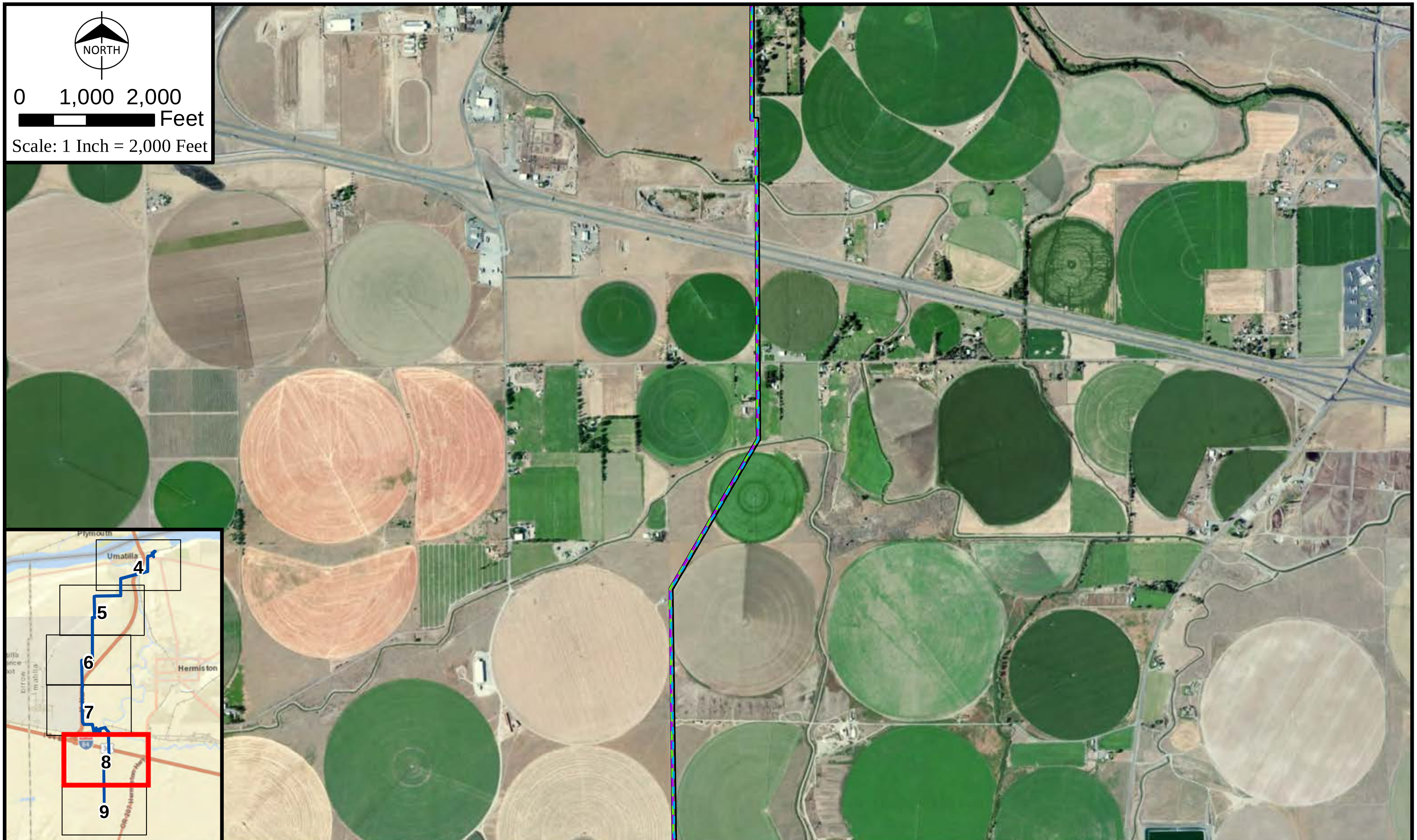

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Temporary Construction Area
- Proposed Riser Structure Fenced Area
- Existing Transmission Structure
- Proposed Transmission Structure
- Existing Transmission Line
- Proposed Transmission Line
- Proposed Gas Line
- Proposed Underground Transmission Line
- Proposed Utility Line
- Proposed Process Water Interconnect
- Proposed Reclaimed Water Interconnect
- Existing Cascade Gasline (Approximate Location)
- Existing GTN Gasline (Approximate Location)

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SINCE 1898

Figure C-8
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/17/2014

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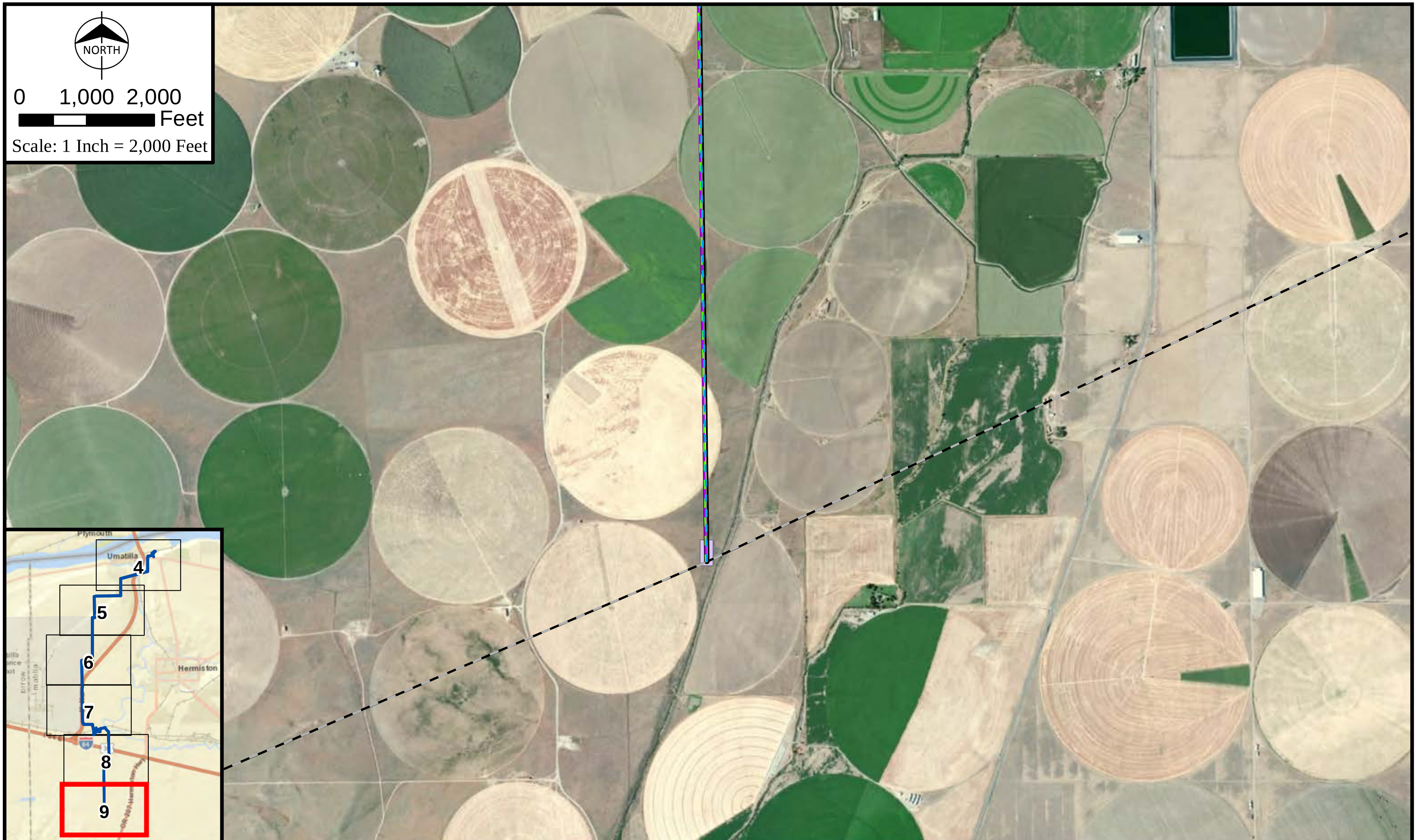

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Temporary Construction Area
- Proposed Riser Structure Fenced Area
- Metering Station
- Existing Transmission Structure
- Proposed Transmission Structure
- Existing Transmission Line
- Proposed Transmission Line
- Proposed Gas Line
- Proposed Underground Transmission Line
- Proposed Utility Line
- Proposed Process Water Interconnect
- Proposed Reclaimed Water Interconnect
- Existing Cascade Gasline (Approximate Location)
- Existing GTN Gasline (Approximate Location)

Burns & McDonnell SINCE 1898

Figure C-9
Project Overview
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); Bing Maps (2013); ESRI (2012/2013) ; and Burns & McDonnell (2014)

Issued: 7/23/2014

Appendix C-1

Land Description for the Perennial Wind Chaser Station Facility Site

Land Description for the Perennial Wind Chaser Station Facility Site: A tract of land in the Northwest Quarter of Section 30, Township 4 North, Range 28 East, Willamette Meridian; said tract being divided by the O.W.R. & R. Railroad, and said tract being more particularly described as follows:

Northwesterly Portion: Beginning at a point which lies at the intersection of the East right-of-way line of Westland Road and the North Line of the North Half of the North Half of the Southwest Quarter of the Northwest Quarter, said point being Easterly 20.00 feet from the Northwest Corner of the Southwest Quarter of the Northwest Quarter, thence Easterly 558.56 feet along the North Line of the North Half of the North Half of the Southwest Quarter of the Northwest Quarter to the northwesterly right-of-way line of said O.W.R. & R. Railroad, thence southwesterly 576.54 feet along said northwesterly right-of-way line to the East right-of-way line of Westland Road; thence northerly 144.91 along said East right-of-way line to the Point of Beginning, containing 0.93 acres within this portion.

Southeasterly Portion: Beginning at a point which lies at the intersection of the East right-of-way line of Westland Road and the southeasterly right-of-way line of said O.W.R. & R. Railroad, said point being 19.71 feet East and 248.71 feet South of the Northwest Corner of the Southwest Quarter of the Northwest Quarter; thence Northeasterly 987.61 feet along the southeasterly right-of-way line of said O.W.R. & R. Railroad to the North Line of the North Half of the North Half of the Southwest Quarter of the Northwest Quarter, thence easterly 124.86 feet along said North Line to the West Line of the Northeast Quarter of the Northwest Quarter, thence northerly 32.36 feet along said West Line to said southeasterly railroad right-of-way line; thence along said O.W.R. & R. Railroad right-of-way northeasterly 619.26 feet; thence southeasterly and perpendicular to the previous line 50.00 feet; thence southwesterly and parallel with prior said O.W.R. & R. Railroad right-of-way line 76.83 to a point which lies 538.00 feet East of the West Line of the Northeast and Southeast Quarters of the Northwest Quarter; thence South and parallel with said West Line 708.71 to a point which lies 257.86 feet South of the South Line of the North Half of the North Half of the Northwest Quarter; thence West and parallel with said South Line 1406.71 feet to the centerline of the Westland Irrigation District canal; thence northeasterly 264.75 feet along said centerline to the South Line of the North Half of the North Half of the Northwest Quarter; thence westerly 271.14 feet along said South Line to the East right-of-way line of Westland Road; thence northerly 82.07 feet along said East right-of-way line to the Point of Beginning, containing 19.04 acres within this portion.

EXHIBIT D

ORGANIZATIONAL EXPERTISE

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

TABLE OF CONTENTS

TABLES

D.1 INTRODUCTION

OAR 345-021-0010(1)(d) *Information about the organizational expertise of the applicant to construct and operate the proposed facility, providing evidence to support a finding by the Council as required by OAR 345-022-0010.*

Response: The Council standards to which this exhibit relates are found in Oregon Administrative Rules (OAR) 345-022-0010(1)-(2); subsection (1) is discussed below while subsection (2) is discussed in section D.7 of this exhibit; OAR 345-022-0010(3)-(4) concern permits and are addressed in Exhibit E – Permits.

OAR 345-022-0010(1) provides:

To issue a site certificate, the Council must find that the applicant has the organizational expertise to construct, operate and retire the proposed facility in compliance with Council standards and conditions of the site certificate. To conclude that the applicant has this expertise, the Council must find that the applicant has demonstrated the ability to design, construct and operate the proposed facility in compliance with site certificate conditions and in a manner that protects public health and safety and has demonstrated the ability to restore the site to a useful, non-hazardous condition. The Council may consider the applicant's experience, the applicant's access to technical expertise and the applicant's past performance in constructing, operating and retiring other facilities, including, but not limited to, the number and severity of regulatory citations issued to the applicant.

Response: This exhibit describes the sources and extent of Perennial-WindChaser LLC's (Perennial's) organizational, managerial, and technical expertise. Perennial has just recently been formed and is a wholly owned subsidiary of Perennial Power Holdings, Inc. (PPH), which itself is a wholly owned subsidiary of Sumitomo Corporation and Sumitomo Corporation of America. These affiliate companies possess the expertise (listed in Table D-1 at the end of this exhibit). With the exception of the natural gas pipeline and meter station, and the 230-kV transmission line, Perennial will construct the Station and all related or supporting facilities including the step-up substation. Perennial will enter into a turnkey engineering procurement and construction (EPC) contract with a qualified and credit-worthy contractor. Perennial will operate the Station and all related or supporting facilities, except the natural gas pipeline with the meter station and the transmission line between the Station and the step-up substation.

The "related or supporting" natural gas pipeline will be constructed and operated by Cascade Natural Gas Corporation (CNG). CNG also constructed and operates the pipeline serving the Hermiston Generating Plant (HGP), which is a related or supporting facility addressed in the Site Certificate for the Hermiston Generating Plant. CNG has been in business in the Pacific Northwest since 1953, and is a natural gas utility serving over 260,000 customers in Oregon and

Washington. The "related or supporting" natural gas meter station will be constructed by Gas Transmission Northwest under its blanket Federal Energy Regulatory Commission (FERC) agreement and operated by CNG. As part of an interstate natural gas pipeline under the jurisdiction of FERC, the meter station will not be subject to the requirements of the site certificate. ORS 469.320(2)(b).

The "related or supporting" transmission line upgrade between the Station and the step-up substation will be constructed by Umatilla Electric Cooperative (UEC). UEC constructed the existing 230/115-kV transmission facility between the HGP and the Bonneville Power Administration McNary Substation; the 230-kV line is a related or supporting facility addressed in the Site Certificate for the Hermiston Generating Plant. UEC has been in business in Oregon since 1937 and constructs, owns and operates electric transmission and distribution facilities serving over 14,000 meters.

Although Perennial will not construct or operate the natural gas pipeline or the transmission line upgrade, Perennial retains responsibility for compliance with applicable site certificate conditions for these "related or supporting" facilities.

D.2 APPLICANT'S PREVIOUS EXPERIENCE

OAR 345-021-0010(1) (d) (A) *the applicant's previous experience, if any, in constructing and operating similar facilities.*

Response: The companies currently have a power portfolio of approximately 6,306 megawatts (MW) of electrical generation, including thermal generation, hydroelectric, wind, and solar, spread across 17 nations on five continents. Table D-1 shows the major facilities that Perennial WindChaser, LLC's (Perennial's) parent companies and subsidiaries currently operate or have interest in, including projects currently under development.

Although the parent companies of Perennial have purchased interests in many existing facilities, they also have significant experience in constructing and supervising the construction of generation projects. A recent example is the construction and operation of the 1,320- MW Tanjung Jati-B Expansion in Indonesia. These affiliated companies prepared and negotiated all the contracts for the design and construction of the project, supervised the construction, and performed many of the engineering functions in support of the design and construction work. The companies' employees have extensive engineering and project management experience associated with generation projects.

With regard to operating facilities, Perennial Power Holdings, Inc. (PPH), through a subsidiary, operates the HGP, located in Umatilla County, Oregon. PPH acquired Hermiston Generating Company, L.P., which owns a 50 percent interest in the HGP, in 2002. PPH was not involved in the construction of the HGP. However, PPH has over 11 years' experience in staffing and operating the HGP, a natural gas–fired generating facility operating under a Site Certificate issued by the Oregon Energy Facility Siting Council. The HGP, moreover, is located immediately north of the Energy Facility Site for the Perennial Wind Chaser Station (Station). Thus, PPH already has over 10 years of experience operating under a Site Certificate in the same environment as the Station site.

D.3 QUALIFICATION OF APPLICANT'S PERSONNEL

OAR 345-021-0010(l) (d) (B) *the qualifications of the applicant's personnel who will be responsible for constructing and operating the facility, to the extent that the identities of such personnel are known when the application is submitted.*

Response: The parent companies and subsidiaries of Perennial have many qualified and experienced employees on staff, including engineers who can supervise the design, construction, and operation of the project. These companies will provide qualified and experienced personnel to manage and supervise the design and construction of the project. Perennial will not use its own personnel for construction work; rather, Perennial will enter into a turnkey EPC contract with a qualified and credit-worthy contractor. Perennial will operate the Station and all related or supporting facilities, except the natural gas pipeline, natural gas meter station, and transmission line to the step-up substation. Perennial has not yet identified the turnkey EPC contractor.

The qualifications of the companies' personnel are provided as examples below:

David Daley, PPH, Senior Vice President-Operations and Development. Mr. Daley has over 15 years' experience in the power and energy infrastructure industry. Prior to his work with PPH, he was an Asset Manager for a 560-MW cogeneration facility located in Indiana, a role he plays in the operation of the HGP as well.

Russ Tenney, PPH, Executive Vice President. Mr. Tenney has over 34 years' experience in the power and energy infrastructure industry. Mr. Tenney is responsible for the corporate operations of PPH and for global technical and commercial support for Sumitomo for investment in power generation assets. He assists with the assessment and evaluation of active and portfolio investments in major power generation auctions and divestitures in Asia, Australia, southeast Asia, the Middle East, and North Africa. He is also currently involved in the development and management of two major (250+ MW) greenfield geothermal projects in Indonesia as a member of the Investor Steering Committee.

Shigenobu Hamada, PPH, President. Mr. Hamada has over 14 years' experience in the power and energy infrastructure industry. Mr. Hamada has been deeply involved with the development, construction, and operations of numerous power plants throughout the world.

In addition, personnel at the HGP may be utilized for training and, in some cases, supervision of operating personnel at the Station.

D.4 QUALIFICATIONS OF KNOWN CONTRACTORS

OAR 345-021-0010(1)(d)(C) *The qualifications of any architect, engineer, major component vendor, or prime contractor upon whom the applicant will rely in constructing and operating the facility, to the extent that the identities of such persons are known when the application is submitted.*

Response: Perennial's parent companies have retained Burns & McDonnell for the design phase of this project. Burns & McDonnell is a full-service engineering, architecture, construction, environmental and consulting solutions firm, with a staff of more than 4,300 people, including engineers, architects, construction professionals, planners, estimators, economists, technicians and scientists, representing virtually all design disciplines. Burns & McDonnell has over 45 years of experience with gas turbine generating facilities.

Perennial will enter into an EPC contract with a qualified and credit-worthy contractor. Perennial will have Burns & McDonnell draft an EPC contract that will serve as the basis for negotiations with a vendor. The parent companies plan to provide a Design Basis and Technical Specifications document in conjunction with the draft EPC contract. The parent companies have extensive experience in the process of preparing and negotiating such documents and in selecting EPC contractors. Perennial has not yet selected a combustion turbine vendor for the Station but expects that one or more of the following will supply the equipment: Siemens, General Electric, Alstom, or equivalent. The parent companies' personnel will supervise and will be extensively involved in overseeing the construction process.

D.5 APPLICANT'S PAST PERFORMANCE

OAR 345-021-0010(1)(d)(D) *The past performance of the applicant, including but not limited to the number and severity of any regulatory citations in constructing or operating a facility, type of equipment, or process similar to the proposed facility.*

Response: Perennial's parent companies have successfully constructed and operated similar energy generating facilities, as listed above in Section D.2.

PPH, a parent company of Perennial, has operated the HGP through a wholly owned subsidiary since 2002. The following statements were presented in the Oregon Department of Environmental Quality (DEQ) Public Notice for the HGP's recent Title V Operating renewal, dated September 19, 2012:

"During the last permit term, the facility was inspected in Sept. 2009 and in April 2011 and was found to be in compliance with permit conditions. No complaints were received during the previous permit term." And "There are no other permits issued or required by DEQ for this facility."

HGP also has a Water Pollution Control Facilities (WPCF) Permit, (No. 102018). In the DEQ Renewal Public Notice for this permit, dated November 16, 2005, the following statements were made:

"This facility was last inspected September 8, 2005, and was found to be operating in compliance. The monitoring reports for this facility were reviewed for the period since the current permit was issued, including any actions taken relating to effluent violations. The permit compliance conditions were reviewed and all inspection reports for the same period were reviewed.

NON ERP-03-026 Failure to submit written report of spill within the required timeframe. The facility currently submits notifications in a timely manner.

NON ERP-04-092 Leached beyond the root zone and over applied nitrogen to peas. Issued an MAO for the leaching, and facility is ensuring that the agronomic application rates of nitrogen are adhered to for its crops.

WL ERP-05-059 Over applied nitrogen to peas. Issued WL requesting that the agronomic application rates of nitrogen are adhered to for pea crops."

and,

"The Department reviewed the compliance history of the facility and evaluated the treatment facility and believes that the facility is capable of continued compliance with the terms of the renewed permit."

The HGP now keeps the WPCF permit in reserve, preferring to have Lamb Weston apply the reclaimed water under its WPCF Permit 48780, as Lamb Weston has far more expertise and experience in the area of farming and irrigation applications.

While the parent companies of Perennial have significant experience with similar facilities, the HGP is the best reference to indicate the likely performance of the Station. Perennial now has long-term experience in meeting the expectations of the State of Oregon and local residents in regard to operational performance and regulatory compliance, both of which have been excellent. The HGP meets its energy contract demands as required. The HGP has no outstanding regulatory issues with regard to environmental or occupational safety and health standards and maintains excellent relations with local residents. The parent companies of Perennial have not been issued any citations in which they were responsible for the operation of a similar facility.

D.6 APPLICANT WITH NO PREVIOUS EXPERIENCE

OAR 345-021-0010(1)(d)(E) *If the applicant has no previous experience in constructing or operating similar facilities and has not identified a prime contractor for construction or operation of the proposed facility, other evidence that the applicant can successfully construct and operate the proposed facility. The applicant may include, as evidence, a warranty that it will, through contracts, secure the necessary expertise.*

Response: Not applicable. As discussed in Sections D.2 and D.3, Perennial and its affiliates have experience in constructing and in operating similar facilities.

D.7 ISO CERTIFIED PROGRAM

OAR 345-021-0010(1)(d)(F) *If the applicant has an ISO 9000 or ISO 14000 certified program and proposed to design, construct and operate the facility according to that program, a description of the program.*

Response: OAR 345-022-0010(2) allows the Council to base its findings under OAR 345-022-0010 "on a rebuttable presumption that an applicant has organizational, managerial and technical expertise, if the applicant has an International Organization for Standardization (ISO) 9000 or ISO 14000 certified program and proposes to design, construct and operate the facility according to that program."

Perennial does not propose to design, construct, or operate the facility according to an ISO 9000 or ISO 14000 certified program.

D.8 MITIGATION DEMONSTRATION

OAR 345-021-0010(1) (d) (G) *If the applicant relies on mitigation to demonstrate compliance with any standards of Division 22 or 24 of this chapter, evidence that the applicant can successfully complete such proposed mitigation, including past experience with other projects and the qualifications and experience of personnel upon whom the applicant will rely, to the extent that the identities of such persons are known at the date of submittal.*

Response: Mitigation measures proposed under Divisions 22 and 24 generally fall into the following categories: (1) pre-construction surveys; (2) facility design measures to avoid or minimize potential impacts; (3) training and work practices during construction to minimize impacts; (4) site restoration following construction; and (5) operational practices to minimize impacts.

As discussed in Sections D.2 and D.3, the Applicant and its affiliated companies and personnel have extensive experience in design and construction of a wide variety of electric generation facilities throughout the world. The Applicant also is utilizing the expertise of Burns & McDonnell in the design phase and will have Burns & McDonnell draft the turnkey EPC contract for negotiation with a contractor, who must be qualified to implement all construction-related mitigation. As also discussed in Section D.2, the parent company of Perennial, PPH, has over 10 years of experience in operating a natural gas–fired combustion turbine facility, the HGP, immediately adjacent to the Station site and under a Site Certificate issued by the Council. Thus, the Applicant, with its contractors and affiliated companies, has the experience to successfully complete mitigation measures relating to the design, construction, and operation of the facility.

Perennial will utilize the Portland Office of Ecology & Environment, Inc. (E & E) for any needed pre-construction wildlife surveys, as well as for overseeing the implementation and monitoring of site restoration efforts outside of Perennial's current expertise. E & E is currently assisting Perennial in the permitting of the Project and has prepared the natural resource and wildlife surveys described in this Application for Site Certificate (Exhibits J – Jurisdictional Wetlands, P – Fish and Wildlife Habitat, and Q – Threatened and Endangered Species). With a staff of over 1,000 scientific and engineering experts in offices throughout the United States and around the world, E & E has extensive experience in performing natural resource, plant, and wildlife surveys, and mitigation and restoration projects, in Oregon and nationwide.

Table D-1 Sources and Extent of Perennial—Wind Chaser LLC's Organizational, Managerial, and Technical Expertise

Power Plant	Fuel	Country	Net Capacity	Operational Date	Acquisition
Hermiston Generating Plant	Nat'l Gas	USA	237 MW	7/1/1996	2002/2005
Cimarron Windpower II	Wind	USA	66 MW	6/1/2012	Since Inception
Ironwood Windpower II	Wind	USA	84 MW	8/1/2012	Since Inception
Stanton Wind	Wind	USA	51 MW	2/1/2008	2009
Shepherds Flat Wind	Wind	USA	190 MW	8/9/2012	Since Inception
Desert Sunlight Investment	Solar	USA	138 MW	3/31/2015	Since Inception
Ambit Waste Coal Power	Bitumen	USA	32 MW	4/1/1993	1993
Amata Power (Bien Hoa) Ltd	Diesel	Vietnam	2 MW	9/1/1997	2007
Summit Mihama Power	Nat'l Gas	Japan	50 MW	7/1/2004	Since Inception
Shuweihat S1	Nat'l Gas	UAE	300 MW	6/30/2005	2008
Shuweihat S3	Nat'l Gas	UAE	326 MW	3/1/2014	Since Inception
Kwinana Power	Nat'l Gas	Australia	160 MW	11/1/2008	2009
Amata B. Grimm Power 1	Nat'l Gas	Thailand	49 MW	9/1/1998	2007
Amata B. Grimm Power 2	Nat'l Gas	Thailand	52 MW	9/1/2001	2007
Amata B. Grimm Power 3	Nat'l Gas	Thailand	24 MW	10/1/2012	Since Inception
Amata B. Grimm Power 4	Nat'l Gas	Thailand	20 MW	9/1/2015	Since Inception
Amata B. Grimm Power 5	Nat'l Gas	Thailand	20 MW	4/1/2016	Since Inception
Amata B. Grimm Power Rayong 1	Nat'l Gas	Thailand	23 MW	6/1/2013	Since Inception
Amata B. Grimm Power Rayong 2	Nat'l Gas	Thailand	23 MW	11/1/2013	Since Inception
Star	Nat'l Gas	Taiwan	27 MW	3/29/2004	Since Inception
Sunba	Nat'l Gas	Taiwan	54 MW	3/29/2004	Since Inception
Star Buck	Nat'l Gas	Taiwan	23 MW	6/30/2009	Since Inception

Table D-1 Sources and Extent of Perennial—Wind Chaser LLC's Organizational, Managerial, and Technical Expertise

Power Plant	Fuel	Country	Net Capacity	Operational Date	Acquisition
Al Hidd IWPP	Nat'l Gas	Bahrain	290 MW	9/1/2008	Since Inception
Phu My 2-2 Power	Nat'l Gas	Vietnam	201 MW	2/4/2005	Since Inception
Tanjung Jati B Power Unit 1&2	Coal	Indonesia	1,320 MW	11/1/2006	Since Inception
Tanjung Jati B Power Unit 3&4	Coal	Indonesia	1,320 MW	1/1/2012	Since Inception
Bluewaters	Coal	Australia	208 MW	11/1/2009	2013
Summit Onahama S Power	Coal	Japan	33 MW	10/1/2004	Since Inception
Birecik Hydro Power	Hydro	Turkey	205 MW	10/1/2001	2005
CBK Power	Hydro	Philippines	396 MW	1/12/2004	2005
EVM	Solar	Spain	2 MW	8/1/2008	Since Inception
EVM2	Solar	Spain	4 MW	8/1/2008	Since Inception
Lavansol 1	Solar	France	15 MW	11/1/2011	Since Inception
EP/ER	Solar	Italy	8 MW	12/1/2010	Since Inception
Osaka Hikarinomori	Solar	Japan	6 MW	10/1/2013	Since Inception
Saijo	Solar	Japan	23 MW	4/1/2015	Since Inception
Kita Kyushu	Solar	Japan	12 MW	8/1/2014	Since Inception
Tomakomoa	Solar	Japan	10 MW	11/1/2014	Since Inception
Summit Myojo Power	Biomas	Japan	33 MW	1/1/2005	Since Inception
Inner Mongol	Wind	China	10 MW	9/1/2009	Since Inception
Dorper Wind Farm	Wind	South Africa	60 MW	7/1/2014	Since Inception
Belwind 1	Wind	Belgium	64 MW	6/28/2011	Since Inception
Northwind	Wind	Belgium	72 MW	6/30/2014	Since Inception
Summit Wind Power (Sakata)	Wind	Japan	16 MW	1/1/2004	Since Inception

Table D-1 Sources and Extent of Perennial—Wind Chaser LLC's Organizational, Managerial, and Technical Expertise

Power Plant	Fuel	Country	Net Capacity	Operational Date	Acquisition
Summit Wind Power (Kashima)	Wind	Japan	20 MW	2/1/2007	Since Inception
Oga Wind Power	Wind	Japan	27 MW	12/1/2014	Since Inception
Total			6,306 MW		

Note
Net Capacity indicates MW by equity percentage of gross capacity. Example: Perennial has 50% equity in Hermiston Generating Plant; the gross capacity is 474 MW, thus the Net Capacity is 237 MW.

Key:
MW megawatts
Nat'l Gas Natural Gas
UAE United Arab Emirates
USA United States of America

EXHIBIT E

PERMITS
OAR 345-021-0010(1)(e)

TABLE OF CONTENTS

APPENDICES

E.1 INTRODUCTION

OAR 345-021-0010(1)(e) *Information about permits needed for construction and operation of the facility.*

Response: This exhibit provides information regarding federal, state, and local government permits needed by Perennial-WindChaser LLC (Perennial) before construction or operation of the proposed Perennial Wind Chaser Station project (Project). These permits are organized into four major headings: (1) federal permits, (2) state permits not federally delegated, (3) state permits federally delegated, and (4) local permits. In addition, a list of ministerial permits and approvals expected for the Project that are not anticipated to be governed by the site certificate is included in Appendix E-1.

E.2 IDENTIFICATION AND DESCRIPTION OF NECESSARY PERMITS

OAR 345-021-0010(1)(e)(A) *Identification of all federal, state and local government permits related to the siting of the proposed facility, a legal citation of the statute, rule or ordinance governing each permit, and the name, mailing address, email address and telephone number of the agency or office responsible for each permit.*

OAR 345-021-0010(l)(e)(B) *A description of each permit and the reasons the permit is needed for construction or operation of the facility and the applicant's analysis of whether the permit should or should not be included in and governed by the site certificate.*

E.2.1 Federal Permits

Response: Rights-of-way (ROWs) are expected to be requested of the U.S. Army Corps of Engineers and Bonneville Power Administration for a step-up substation and for an extension of a transmission line into the McNary Substation from the proposed step-up substation. A federal permit is not necessary for the ROWs; however, approval of the ROWs will be conducted under the National Environmental Policy Act process. One federal permit may be required for the construction of the Project (a Federal Aviation Administration [FAA] permit). None are required for the operation of the Project.

Permit: **Notice of Proposed Construction or Alteration (Permit 7460-1)**

Agency: Federal Aviation Administration
1601 Lind Avenue Southwest
Renton, WA 98057
Dan Shoemaker
Airspace Specialist, FAA
dan.shoemaker@faa.gov
(425) 227-2791

Standards: Federal Aviation Act of 1958 (14 U.S. Code [USC] Section 44718) 14 Code of Federal Regulations (CFR) Part 77 (2008)

Discussion: This permit is not required for construction of the Project's emission stacks themselves, which are the Project's tallest structures (they are less than 200 feet and over 5 miles from the nearest airport); however, it may be required for the use of construction cranes if they are taller than 200 feet. If necessary, permit applications (7460-1) will be filed with the FAA 60 days prior to construction or use. Approvals will be obtained directly from the FAA; thus, the Project should not be governed by the site certificate regarding this federal approval. If permit applications are submitted to the FAA for the use of the cranes, one executed form set (four copies) of FAA Form 7460-1 will be sent to the Oregon Department of Aviation.

E.2.2 State Permits: Not Federally Delegated

Response: Five state permits may be required for the construction and operation of the Perennial Wind Chaser Station (Station).

Permit: **Energy Facility Site Certificate**

Agency: Energy Facility Siting Council
Oregon Department of Energy
625 Marion Street NE, Suite 1
Salem, Oregon 97301-3742
Ms. Andrea Goodwin, JD
andrea.goodwin@state.or.us
(541) 567-3840 x222

Standards: Oregon Revised Statutes (ORS) 469.300-469.520;
Oregon Administrative Rules (OAR) 345, Divisions 1, 21-24, 26-27

Discussion: The Project is defined as an "energy facility" under ORS 469.300(11) because it will generate more than 25 megawatts, which is the threshold for a combustion turbine power plant that requires a site certificate issued by the Oregon Energy Facility Siting Council

(Council). This Application for Site Certificate (ASC) provides the information required to demonstrate that applicable siting standards have been met.

Permit: **Archaeological Excavation Permit**

Agency: State Historic Preservation Office
Oregon Parks and Recreation Department
724 Summer Street, NE, Suite C
Salem, Oregon 97301-1266
Dennis.Griffin@state.or.us
(503) 986-0674

Standards: The National Historic Preservation Act of 1966 as amended (16 USC § 470*), inter alia*; 7 CFR Part 3100; ORS Chapters 97, 358 and 390; OAR 345-022-0090 and OAR 736-051

Discussion: If an archaeological site is discovered during construction, activities at the site will cease and Perennial will report the finding to the State Historic Preservation Office (SHPO) immediately. See Exhibit S – Cultural Resources for a more detailed discussion of archaeological resources in relation to the Project. No known archaeological resources would be excavated; therefore, it is not possible to apply for an archaeological excavation permit as part of the ASC. Should this permit be required during construction, it will be obtained directly from the SHPO, and, consistent with prior practice, the Council can condition the site certificate to require such a permit.

Permit: **Oversize Permit**

Agency: Motor Carrier Transportation Division
Oregon Department of Transportation
3930 Fairview Industrial Drive SE
Salem, OR 97302-1166
Over-Dimension Permit Unit
(503) 373-0000

Standards: ORS 818.200-818.270
OAR 734-082

Discussion: Transportation of loads on state highways and county roads that exceed established size and/or weight limits requires a permit (also known as a Superload Permit) from the Motor Carrier Transportation Division. Movement of oversized loads on public roadways requires a joint permit issued by the State and the County. The Oregon Department of Transportation (ODOT) issues the permit after incorporating any County agency concerns or conditions. Perennial anticipates that the supplier of large equipment necessary for the Station will be responsible for transporting the equipment and obtaining necessary third party permits. The impacts of construction traffic are addressed in Exhibit U – Public Services, which includes a Traffic Impact Analysis. Pursuant to ORS 469.401(4), these permits are not addressed in the ASC, even though the impacts of construction traffic are addressed under the Council's Public Services Standard.

Permit: **State Highway Approach Permit and Utility Facility Permit**

Agency: Oregon Department of Transportation
District 12 - Pendleton
1327 SE Third Street
Pendleton, Oregon 97801
(541) 276-1241

Standards: ORS 184 & ORS 374
OAR 734, Divisions 51 and 55
OAR 345-021-0010(1)(u)
OAR 345-022-0110

Discussion: Any utility installations within the ROW of a state highway will require a Utility Facility Permit (also known as a Permit to Occupy or Perform Operations upon a State Highway) issued by ODOT. The Project's natural gas pipeline will need to be routed under Interstate Highway 84 (State Highway #2), and the transmission line will need to cross Interstate Highway 82 (State Highway #70) twice, as well as U.S. Route 730 (State Highway #2). Perennial understands that the Utility Facility permit is a construction-related permit rather than siting-related permit; pursuant to ORS 469.401(4), therefore, the permit falls under the jurisdiction of ODOT and is not included in or governed by the site certificate. Perennial will apply for this permit as soon as the design and site plans are finalized.

Any access from Oregon state highways will require a State Highway Approach Permit. It is not expected that a State Highway Approach Permit will be necessary for the Project, and both the planned access on Westland Road for the Station and the existing access on Brownell Ditch Road for the step-up substation are also outside of the Interstates' zones of influence.

Permit: **Onsite Sewage Treatment System Permit**

Agency: **Department of Environmental Quality**
Water Quality Onsite Program - Eastern Region
800 SE Emigrant, #330
Pendleton, OR 97801
514-276-4063

Standards: ORS Chapter 468B
OAR Chapter 340-071-0100 through 0650

Discussion: Perennial will apply for an Onsite Sewage Treatment System Permit for regulating a sanitary septic system for the Project after obtaining a favorable site evaluation report from the DEQ. System size is expected to be less than 1,000 gallons per day. Infiltration testing conducted as part of the Preliminary Geotechnical Engineering Report located in Appendix H-1 of Exhibit H - Geology indicates that the site is suitable for an onsite system. A request for a site evaluation by the Oregon Department of Environmental Quality (DEQ) will be made as soon as design and site plan are finalized. Details of the proposed preliminary design of the septic system that show compliance with DEQ rules are included in Appendix V-2 of Exhibit V – Solid Waste and Wastewater.

Permit: **Notice of Proposed Construction or Alteration**
Agency: **Department of Aviation**
3040 25th Street, SE
Salem, OR 97302-1125
Jeff Caines
503-378-2529
Jeff.Caines@aviation.state.or.us

Standards: ORS Chapter 836.530 and 836.535
OAR Chapter 738, Division 70

Discussion: Perennial will submit FAA Form 7460-1 to the Oregon Department of Aviation and the FAA and obtain a determination of air safety from the Department if construction cranes for the Project will be more than 200 feet tall. Perennial understands that the permits are construction-related permits rather than siting-related permits; pursuant to ORS 469.401(4), therefore, the permits fall under the jurisdiction of the Oregon Department of Aviation and are not included in or governed by the site certificate. The forms will be submitted at least 60 days prior to construction if cranes taller than 200 feet will be used in construction.

E.2.3 State Permits: Federally Delegated

Response: Four federally delegated state permits will be required for the construction and operation of the Station. Pursuant to ORS 469.503(3), permits issued by state agencies under federally delegated programs—i.e., under programs for which the determination of compliance has been delegated by a federal agency to a state agency other than the Council—are not within the Council's jurisdiction and are not included in or governed by the site certificate.

Permit: **Air Contaminant Discharge Permit (ACDP) and Prevention of Significant Deterioration Permit (PSD)**

Agencies: Oregon Department of Environmental Quality – Eastern Region
800 SE Emigrant Avenue, Suite 330
Pendleton, Oregon 97801
Mr. Douglas Welch, PE
Welch.doug@deq.state.or.us
(541) 278-4621

Standards: ORS Chapters 468 and 468A
OAR 340-216-0010 through 340-224-0110
Clean Air Act (42 USC § 7401 et seq.)
40 CFR Parts 50, 51 and 52

Discussion: PSD Permit review authority has been delegated to the DEQ by the U.S. Environmental Protection Agency under the federal Clean Air Act and will be covered by the ACDP. Perennial submitted the ACDP/PSD Applications to the DEQ on September 12, 2013. A copy of the air permit application and the letter from the DEQ are provided in Appendix E-2. Since the permit is issued by the DEQ under federally delegated authority, it is not included in or governed by the site certificate.

Permit: **Title V Operating Permit**

Agency: Department of Environmental Quality - Eastern Region
800 SE Emigrant Avenue, Suite 330
Pendleton, Oregon 97801
Mr. Douglas Welch, PE
Welch.doug@deq.state.or.us
(541) 278-4621

Standards: ORS 468 and 468A
OAR 340-218 and 340-220
Clean Air Act, Title V (42 USC §§ 7661 through 7661f)
40 CFR 70

Discussion: A Title V Operating Permit is required from the DEQ for any major stationary source of air pollutants that directly emits, or has the potential to emit, 100 tons per year of any regulated air pollutant. Because it is an operating permit, DEQ rules require a facility to operate for a period so that current operating data can be used in the permit. A Title V application will be submitted as required by the DEQ, within one year of start of operations. Since a Title V permit is issued by the DEQ under federally delegated authority, it is not included in or governed by the site certificate. In addition, under ORS 469.401(4), the Title V permit is not addressed in the ASC, since it does not relate to the siting of the facility.

Permit: **Title IV Acid Rain Program**

Agencies: Oregon Department of Environmental Quality – Eastern Region
800 SE Emigrant Avenue, Suite 330
Pendleton, Oregon 97801
Mr. Douglas Welch, PE
Welch.doug@deq.state.or.us
(541) 278-4621

Standards: OAR 340-218, 340-220 and 340-228
Clean Air Act, Title IV; 42 USC §§ 7651 through 7651e
40 CFR Part 73 (sulfur dioxide requirements)
42 USC § 7651f
40 CFR Part 76 (nitrogen oxide requirements)

Discussion: 40 CFR Part 72 (July 1, 1994) has been adopted and incorporated by reference in the OAR for purposes of implementing an acid rain program that meets the requirements of Title IV of the Clean Air Act. An application for the four units will be submitted 24 months before the units commence operations. Since a Title IV is administered by the DEQ under federally delegated authority, it is not included in or governed by the site certificate.

Permit: **National Pollutant Discharge Elimination System (NPDES) Permit**

Agencies: Oregon Department of Environmental Quality - Eastern Region
Water Quality Division
475 NE Bellevue Drive, Suite #110
Bend, Oregon 97701
Ms. Krista Ratliff
Ratliff.krista@deq.state.or.us
(541) 633-2033

Standards: ORS 468 and 468B
OAR 340-014, 340-041, 340-045, 340-052, and 345-055
Clean Water Act of 1977 (33 USC § 1251 et seq.)
40 CFR Parts 6, 122 and 124

Discussion: Perennial has applied for a 1200-C Construction Stormwater NPDES Permit for regulating stormwater runoff from construction activities of the Project. A copy of the NPDES permit application and the response letter from the DEQ are contained in Appendix I-2 of Exhibit I – Soils. Since the permit will be obtained directly from the DEQ under federally delegated authority, it is not included in or governed by the site certificate.

E.2.4 Local Permits

Response: Land use permits from Umatilla County and the City of Umatilla will be required for the construction and operation of the Station.

Permit(s): Umatilla County Conditional Use and Zoning Permits

Agency: Umatilla County Department of Land Use Planning
216 S.E. 4th Street
Pendleton, Oregon 97801
Ms. Tamra Mabbott, Planning Director
tamra@co.umatilla.or.us
(541) 278-6246

Standards: ORS 215.283 and 215.275
Applicable Statewide Planning Goals
Site Plan Review
Zoning Permit
Umatilla County Comprehensive Plan
Umatilla County Development Code
1972 Umatilla County Zoning Ordinance
Umatilla County Transportation System Plan
Umatilla County Natural Hazards Mitigation Plan
Applicable Statewide Planning Goals

Discussion: Perennial is electing to pursue local permits through ORS 469.504(1)(b). Perennial will demonstrate compliance with the substantive criteria from the County of Umatilla through the Council. As detailed in Exhibit K – Land Use, a Conditional Use Permit will be required for the Project's Energy Facility Site and for the new transmission towers to be constructed in the Light Industrial (LI) zone. Zoning permits will be required for each tax lot affected by the construction of the Station, the new transmission towers, and the step-up substation. If requested, Perennial will also apply for zoning permits for all tax lots crossed by the reconductored portions of the existing transmission line. New structures require zoning permits. Perennial requests the Council's approval of these permits/local land use approvals under ORS 469.504(1)(b) and requests that these approvals be included in and governed by the site certificate.

Permit(s): Umatilla City Conditional Use Permit

Agency: Umatilla City Planning Department
700 Sixth Street
Umatilla, Oregon 97882

Mr. Bill Searles
Bills@umatilla-city.org
(541) 922-3226 X101

Standards: City of Umatilla Comprehensive Plan
City of Umatilla Zoning Code
Applicable Statewide Planning Goals
Site Plan Review

Discussion: The existing transmission line passes through the city limits on its way to the McNary Substation. Activities inside the city limits consist of restringing the electrical conductors from 115 to 230 kV. As detailed in Exhibit K – Land Use, a Conditional Use Permit will be required for the transmission line in the NC, R1, and R2 zones of the City of Umatilla. Perennial requests the Council's approval of these permits/local land use approvals under ORS 469.504(1)(b) and requests that these approvals be included in and governed by the site certificate.

E.3 PERMITS SUBJECT TO THE ENERGY FACILITY SITING COUNCIL

OAR 345-021-0010(1)(e)(C) *For any state or local government agency permits, licenses or certificates that are proposed to be included in and governed by the site certificate, evidence to support findings by the Council that construction and operation of the proposed facility will comply with the statutes, rules and standards applicable to the permit. The applicant may show this evidence: (i) In Exhibit J for permits related to wetlands (ii) In Exhibit O for permits related to water rights.*

Response: As discussed in Section E.2.4, construction and operation of the Station will require land use approvals, including conditional use permits, from Umatilla County and the City of Umatilla. Evidence supporting findings by the Council that construction and operation of the Station will comply with all statutes, rules, and standards applicable to the permits is provided in detail in Exhibit K – Land Use with respect to Umatilla County and City of Umatilla land use standards.

As discussed in Section E.2.2, the septic leach field system for disposal of sanitary wastewater will require a permit from the DEQ; that permit is under the jurisdiction of the Council. Details of the proposed preliminary design of the septic system that show compliance with DEQ rules are included in Appendix V-2 of Exhibit V – Solid Waste and Wastewater.

No permits or approvals related to wetlands and water rights are necessary for the Project. Support for these conclusions is provided in Exhibits J – Jurisdictional Wetlands and O – Water Use, respectively.

E.4 FEDERALLY DELEGATED PERMIT APPLICATION

OAR 345-021-0010(1)(e)(D) *For federally-delegated permit applications, evidence that the responsible agency has received a permit application and the estimated date when the responsible agency will complete its review and issue a permit decision.*

Response: See Section E.2.3 above.

E.5 THIRD-PARTY STATE AND LOCAL PERMITS

OAR 345-021-0010(1)(e)(E) *If the applicant relies on a state or local government permit or approval issued to a third party, identification of any such third party permit and for each: (i) Evidence that the applicant has, or has a reasonable likelihood of entering into a contract or other agreement with the third party for access to the resource or service to be secured by that permit: (ii) Evidence that the third party has or has a reasonable likelihood of obtaining, the necessary permit; and (iii) An assessment of the impact of the proposed facility on any permit that a third party has obtained and on which the applicant relies to comply with any applicable Council standards.*

Response: Perennial will rely on three third-party permits for the construction and operation of the Station. The first third-party permit deals with the water supply. The second and third third-party permits deal with the reclaimed water generated by the Station. Perennial proposes to send reclaimed water from the Project to the Hermiston Generating Plant (HGP) as makeup water for the HGP's cooling towers. The HGP operates under a Council Site Certificate. The HGP then discharges its reclaimed water to Lamb Weston. Lamb Weston uses the reclaimed water for wash down or irrigation purposes. Lamb Weston operates under a Water Pollution Control Facilities Permit.

Permit:	**Water Right Permit S-49497** Issued to Port of Umatilla 500 Willamette Street Umatilla, Oregon 97882 Mr. Kim Puzey, General Manager 541-922-3224
Agency:	**Oregon Water Resources Department** 725 Summer Street NE, Suite A Salem, OR 97301
Standards:	ORS Chapter 537 OAR Chapter 690

Discussion: The Port of Umatilla has issued a letter stating that it expects to able to enter into a contract with Perennial Power Holdings, Inc. to supply up to 2,000 gallons per minute for the Project. A copy of the letter is included in Appendix O-1 of Exhibit O – Water Use. As detailed in Exhibit O – Water Use, use of this water by the Station is consistent with the existing permit, agreement, and any applicable Council standards, so no changes to the existing permit or additional water rights will be necessary.

Permit: **Water Pollution Control Facilities Permit 48780**
Issued to ConAgra Foods Lamb Weston, Inc.
78153 Westland Road
Hermiston, OR 97838
Mr. David Nevin, Energy and Environmental Manager
David.Nevin@conagrafoods.com
(541)-481-2011

Agency: **Department of Environmental Quality**
Columbia Gorge Office
400 East Scenic Drive, Building 2
The Dalles, OR 97058
514-298-7255

Standards: ORS Chapter 468B
OAR Chapter 340, Division 45

Discussion: Lamb Weston's Water Pollution Control Facilities Permit allows the facility to manage and dispose of the HGP's wastewater, among other wastewaters, by land application for beneficial use on the North Farm and the Madison Farm in accordance with the DEQ-approved Operations, Monitoring, and Management Plan. The permit is currently being renewed. Because this permit is under review, Lamb Weston has not been able to consent to the Project sending reclaimed water to the HGP. If Lamb Weston is eventually able to accept reclaimed water from the HGP that has come from the Station, then Perennial prefers to have all the necessary process and approvals in place to do so. Exhibit V – Solid Waste and Wastewaters details how the Project will comply with any Council standards that apply to this option. Should Lamb Weston not be able to accept reclaimed water from HGP that has come from the Station, then Perennial would install a zero liquid discharge (ZLD) system. Exhibit V– Solid Waste and Wastewaters also details how the Project will comply with any applicable Council standards that apply to a ZLD system if this option is chosen.

Permit: **Site Certificate**
Issued to PacifiCorp and Hermiston Generating Company
78145 Westland Road
Hermiston, OR 97838

Mr. Richard Moroney, General Manager
Richard.moroney@perennialpower.net
(541) 564-8320

Agency: **Energy Facility Siting Council**
Oregon Department of Energy - Hermiston Office
395 E. Highland Avenue
Hermiston, Oregon 97838
Mr. Duane Kilsdonk
Duane.kilsdonk@odoe.state.or.us
514-567-3840 X224

Standards: ORS 469.300-469.520
OAR 345, Divisions 1, 21-24, 26-27

Discussion: Once Lamb Weston has indicated that it can accept reclaimed water from the HGP that has come from the Station, Hermiston Generating Company (HGC) will issue a letter to Perennial indicating acceptance of the Station's reclaimed water. Perennial expects that the Station will generate suitable wastewater for re-use as makeup water in the HGP because cooling water at the Station will be used inside the turbine equipment, which requires higher water quality specifications than cooling tower makeup water used at the HGP. Given the anticipated quality of water the HGP would receive from the Station, HGC anticipates no difficulty in continuing to meet the parameters of its contract with Lamb Weston, as well as all environmental standards and applicable Council standards, and that no amendment of the site certificate for the HGP would be required. Exhibit V– Solid Waste and Wastewaters also details how the Project will comply with any applicable Council standards. Should HGC not be able to accept reclaimed water from the Station, then Perennial would install a ZLD system. Exhibit V – Solid Waste and Wastewaters also details how the Project will comply with any applicable Council standards with a ZLD system.

E.6 THIRD-PARTY FEDERALLY DELEGATED PERMITS

OAR 345-021-0010(1)(e)(F) *If the applicant relies on a federally-delegated permit issued to a third party, identification of any such third-party permit and for each: (i) Evidence that the applicant has, or has a reasonable likelihood of entering into, a contract or other agreement with the third party for access to the resource or service to be secured by that permit. (ii) Evidence that the responsible agency has received a permit application. (iii) The estimated date when the responsible agency will complete its review and issue a permit decision.*

Response: Perennial will not rely on a federally delegated third-party permit for the construction or operation of the Station.

E.7 MONITORING PROGRAM

OAR 345-021-0010(1)(e)(G) *The applicant's proposed monitoring program, if any, for compliance with permit conditions.*

Response: Perennial, in collaboration with associated agencies, will establish monitoring programs for compliance with permit conditions associated with the Project. Compliance with permit conditions related to the Project is the responsibility of Perennial, and proposed monitoring programs for compliance with permit conditions are described in applicable exhibits. Perennial will comply with all permit and certificate conditions related to the Project by developing a compliance tracking system that assigns due dates and/or trigger events for site certificate conditions. Additionally, a responsible individual will be assigned to each condition to ensure that it is complied with. Additional discussions of monitoring programs are as follows:

- Threatened and endangered species disturbance, see **Exhibit Q**
- Scenic resources disturbance, see **Exhibit R**
- Cultural resources disturbance, see **Exhibit S**
- Recreational resources disturbance, see **Exhibit T**
- Public services disturbance, see **Exhibit U**
- Stormwater and wastewater, see **Exhibit V**
- Hazardous materials, see **Exhibit G**
- Noise, see **Exhibit X**

APPENDIX E-1

List of Ministerial Permits

List of Ministerial Permits

Since the following permits and/or approvals are federal, federally delegated (ORS 469.503(3)), or related to construction rather than siting (ORS 469.401(4)), they will be obtained directly from various agencies and will not be included in or governed by the site certificate.

Permits Pertaining to the Operations of the Station

Permit: **Hazardous Waste Generator Registration**

Agency: Department of Environmental Quality - Land Quality Division
Hazardous Waste Section
811 SW Sixth Avenue
Portland, Oregon 97204
(503) 229-5913; and
2020 SW Fourth Avenue, Suite 400
Portland, Oregon 97201
Ms. Edna Mayes
(503) 229-6938

Standards: 40 CFR 261.5 and 262.12
OAR 340-102

Discussion: This is not a permit; however, if the generation and storage of hazardous waste exceeds the threshold quantities identified by 40 CFR 261.5 for a conditionally exempt small quantity generator, then Perennial will register and obtain a generator identification number.

Permit: **Emergency Risk Management Plan**

Agency: Environmental Protection Agency
Office of Emergency Management
RMP Reporting Center
P.O. Box 10162
Fairfax, VA 22038
PMPRC@eoacdx.net
(703)-227-7650

Standards: 40 CFR 68

Discussion: This is not a permit; however, if a tank, drum, container, pipe, or other "process" at a facility contains any of the extremely hazardous toxic and flammable substances listed in CFR at 40 CFR 68.130 in an amount above the "threshold quantity" specified for that substance, the owner is required to develop and implement a risk management program under a rule issued by the U.S. Environmental Protection Agency. An Emergency Risk Management Plan (RMP) will be developed prior to construction to comply with this standard. Currently, an RMP is expected to be necessary for the ammonia stored onsite.

Permits Pertaining to the Construction of the Station

A number of permits would be obtained closer to the beginning of construction, as more detailed information regarding schedule, materials, transport, and building become available

Permits: **Plumbing, Structural/Mechanical/Energy, Elevator, Fire Marshal, Electrical, Pressure Vessel (Boiler)**

Agency: Building Codes Division
Department of Consumer and Business Services
1535 Edgewater NW
Salem OR 97301-3878
(503) 378-4133

Standards:	ORS 447	Building Codes Division
	ORS 455	Building Codes Division
	ORS 460	Building Codes Division
	ORS 479	Building Codes Division
	ORS 480	Building Codes Division
	ORS 671	Building Codes Division
	OAR 918, Division 225	Building Codes Division
	OAR 918, Division 290	Building Codes Division
	OAR 918, Division 300	Building Codes Division
	OAR 918, Division 302	Building Codes Division
	OAR 918, Division 400	Building Codes Division
	OAR 918, Division 440	Building Codes Division
	OAR 918, Division 460	Building Codes Division
	OAR 918, Division 750	Building Codes Division
	OAR 918, Division 770	Building Codes Division
	OAR 918, Division 780	Building Codes Division

Discussion: The construction plans for the Station will be reviewed for structural and safety permits by the Oregon Building Codes Division. The purpose of this process is to ensure adequate design for operational safety. Review by the Building Codes Division will include structural, electrical, mechanical, plumbing, and safety considerations. Review and issuance of the necessary permits will be conducted through the Salem Office of the Building Codes Division. The result of this review will be issuance of building permits, electrical permits, and other plant operational component permits. Umatilla County has not yet assumed the Building Permit Program from the State.

Permit: **Road Approaches Permit**

Agency: Umatilla County Public Works
3920 Westgate Street
Pendleton, Oregon 97801
(541) 278-5424

Standards: ORS 375.305-374.325

Discussion: All road crossings and new access points are required to comply with the Umatilla County Public Works and transportation specifications in order to ensure the protection of the roadways being crossed and the travelling public. The Oregon Department of Transportation Rail (ODOT Rail) has jurisdiction over traffic issues within 495 feet of the rail road grade crossing on Westland Road. Through telephone and email correspondence, ODOT Rail staff has reviewed the preliminary site plan and provided initial comments related to design details at the proposed site-access intersection. Refer to Exhibit U – Public Services for additional details. As long as Perennial does not modify the Rail Road crossing equipment (including the guard rail), then there is no permit needed from ODOT Rail. If Perennial has to modify the existing guard rail as a result of turning movements at the new driveway, then Perennial will need to apply for and obtain a Rail Crossing Order from ODOT Rail. Perennial anticipates that the Rail Road crossing equipment (including the guard rail) will not need to be modified; thus, a permit from ODOT Rail will not be needed. Perennial understands that the Road Approaches Permit is a construction-related permit rather than siting-related permit. The impacts of operational and construction traffic within this zone are addressed in Exhibit U – Public Services, which includes a Traffic Impact Analysis. Pursuant to ORS 469.401(4), these permits are not addressed in the ASC, even though these impacts of traffic are addressed under the Council's Public Services Standard.

Permits: **Natural Gas Pipeline and Transmission Line Safety Review**

Agency: Oregon Public Utility Commission
550 Capitol St. NE, Suite 215
Salem, OR 97308
503-378-6634

Standards: ORS 757.035
ORS 757.039
ORS 757.542 through 757.562
ORS 757.600 through 757.667

ORS 765.040
OAR 860-024
OAR 860-028-005
OAR 860-031
OAR 860-038-0400
OAR 952

Discussion: The Oregon Public Utility Commission will conduct safety reviews of the design for the natural gas pipeline and the transmission line, including interconnection to the energy facility. In addition, operators of underground facilities are required by ORS 757.557(1) to subscribe to the Oregon Utility Notification Center. Rules in OAR 952, Division 001 include standards for marking underground facilities.

Permit: **Hazardous Materials Survey Application to Install Flammable/Combustible Liquid Tanks**

Agency: Office of State Fire Marshal
4760 Portland Road NE
Salem, OR 97305-1760
(503) 378-3473

Standards: ORS 453
ORS 476
ORS 479
OAR 837-020
OAR 837-040 (Uniform Fire Code)
OAR 837-085
OAR 837-090

Discussion: Businesses that use or store hazardous substances are required to report such substances annually to the State Fire Marshal and to pay hazardous substance possession fees. Prior to installation of aboveground tanks for the storage of flammable or combustible liquids, Perennial will prepare plans showing compliance with the Uniform Fire Code and submit the plans for review by the State Fire Marshal.

Permit: **Public Water System Plan Review**

Agency: Oregon Health Authority, Drinking Water Services
State Office Building, Suite 640
800 NE Oregon St.
Portland, OR 97232
(971) 673-0405

Standards: ORS 448.131
OAR 333-061

Discussion: Plans for the Station's water system connection to process water supply of the Port of Umatilla or from a water well will be submitted to the Health Division, if required, for approval. After construction of the system, sampling and analysis of drinking water, if required, will be conducted pursuant to Health Division guidelines and reported to the Health Division.

APPENDIX E-2

Air Permit (ACDP/PSD) Application and Letter from the Oregon Department of Environmental Quality

Applications for

Prevention of Significant Deterioration Permit / Air Contaminate Discharge Permit

Perennial Wind Chaser Station

Submitted to

Oregon Department of Environmental Quality

Submitted by

Perennial-WindChaser LLC
600 Third Avenue, 30F
New York, NY

September 2013

Prepared by

RTP Environmental Associates, Inc.
2050 Torrey Pines Road
La Jolla, California 92037
(858) 456-8020

Table of Contents

Table of Contents (continued)

FIGURES

Table of Contents (continued)

APPENDICES

1.0 INTRODUCTION

Perennial-WindChaser LLC (Perennial) is proposing to construct and operate a nominal 415 megawatt (MW) open-cycle natural gas-fired electricity generation plant, the Perennial Wind Chaser Station (Station), near Hermiston, Oregon. The Station will serve to complement the electrical generation from the wind power farms in the area when the wind levels are low and will decrease rates of generation when the wind projects are producing electricity. Perennial proposes to locate the Station across the Union Pacific railroad tracks from Hermiston Generating Plant (HGP). Perennial, through a wholly owned subsidiary, operates the 468 MW natural gas-fired combined cycle electricity generation plant (HGP).

Federal and State New Source Review regulations require that the Station be evaluated as a major modification of HGP due to the Station's location, similar operation, and operational control. This application covers the proposed Station under the major modification rules, and provides a description of the Station, emissions calculations, regulatory applicability, a best available control technology (BACT) analysis and a comprehensive air quality impact analysis.

Perennial, through its wholly owned subsidiary, has an ownership in a portion of HGP. However, due to the differences in ownership aspects between the two power plants, Perennial requests that separate permits be issued for the Station.

1.1 Application Contacts

The following persons can be contacted for information regarding this application:

David Daley
Senior Vice President
Perennial Power Holdings, Inc.
600 Third Avenue, 30 F
New York, NY 10016
936-447-4927

Paul Neil (Permitting Project Manager)
Principal
RTP Environmental Associates, Inc.
2050 Torrey Pines Road
La Jolla, CA 92037
858-456-8020

Greg Darvin (Air Quality Impact Analysis)
Principal
Atmospheric Dynamics, Inc.
Torres Street 3 SW of Mountain View
P.O. Box 5907
Carmel-by-the-Sea, CA 93921-5907
831-620-0481

1.2 Application Forms

Completed and signed application forms are included in Appendix A of this report.

Form AQ101
Form AQ102
Form AQ201-CTG1
Form AQ201-CTG2
Form AQ201-CTG3
Form AQ201-CTG4
Form AQ201-EG1
Form AQ201-FP1
Form AQ230-CT1
Form AQ307-SCR1
Form AQ307-SCR2
Form AQ307-SCR3
Form AQ307-SCR4
Form AQ307-CO1
Form AQ307-CO2
Form AQ307-CO3
Form AQ307-CO4
Form AQ401
Form AQ402
Form AQ403

2.0 PROJECT DESCRIPTION

The Station will generate a nominal 415 MW of electricity under annual average site conditions. Proposed equipment includes 4 (four) General Electric LMS100 (or equivalent) natural gas-fired combustion turbine generators.

2.1 Existing Facility Description

Perennial, through a wholly owned subsidiary, operates and partially owns the 468 MW combined cycle electric power plant located at 78145 Westland Road, near Hermiston, Oregon (Hermiston Generating Plant (HGP)). HGP is within Standard Industrial Code (SIC) 4911. HGP was issued its Site Certificate from the Oregon Energy Facilities Siting Council in March 11, 1994 and an Air Contaminate Discharge Permit from the Oregon Department of Environmental Quality (DEQ) in conjunction with the Site Certificate. The Station will be located across a railroad right-of-way south of HGP.

HGP consists of two GE Frame 7Fa combustion turbine generators (CTGs) fueled only by natural gas, two heat recovery steam generators (HRSG), not equipped with duct burners, and two steam turbines. Process steam is sent to the adjacent Lamb-Weston facility for their operation use. Each combustion turbine uses dry-low-NO_X combustors and selective catalytic reduction (SCR) for NO_X control downstream of the two HRSGs.

2.2 Site Location

The Station is located in the semi-arid, north central region of the State (Section 30, Township 4 North and Range 28 East, 45.802 degrees Latitude, 119.367 degrees Longitude), approximately six miles southwest of the City of Hermiston, Oregon. An area map indicating the location of the Station is shown in Figure 1 of this report. The area map shows the site property relative to predominant geographical features, such as railroad tracks, rivers and roads. Elevation of the site will be approximately 560 AMSL.

2.3 Proposed Project

The proposed project will include four (4) GE LMS100 or equivalent natural gas fired CTGs operating in simple cycle. The turbines will use water injection and selective catalytic reduction with ammonia injection for NO_X control and catalytic oxidation to control emissions of carbon monoxide and volatile organic compounds. Other components of the project consist of a diesel-fired emergency generator and a fire pump. A four-cell cooling tower will also be utilized. Operation of the emergency generator and fire pump will be limited to 100 hours per year for reliability testing and maintenance.

The Wind Chaser Station and the Hermiston Generating Plant (HGP) constitute a single source for purposes of determining applicability of Oregon's New Source Review program. OAR Section 340-200-0020(128). There will be no physical changes or modifications at HGP. The table below shows the total emissions increases with the addition of the Wind Chaser Station (units in tons per year):

Pollutant	SER (tpy)	HGP Netting Increase	Wind Chaser Increase	Total Increase	Exceed SER?
PM	25	0	59	59	Yes
PM_{10}	15	0	59	59	Yes
$PM_{2.5}$	10	0	59	59	Yes
CO	100	0	212	212	Yes
NO_X	40	0	111	111	Yes
SO_2	40	33	6	39	No
VOC	40	39	34	73	Yes
GHG	75,000	88,000	1,058,349	1,114,349	Yes
H_2SO_4	7	NA	4	4	No
Note: SER = Significant Emission Rate					

As a result, the Wind Chaser Station is considered a major PSD modification for all of the listed pollutants, except for SO_2 and H_2SO_4, and the remaining requirements of the PSD rules apply to these pollutants.

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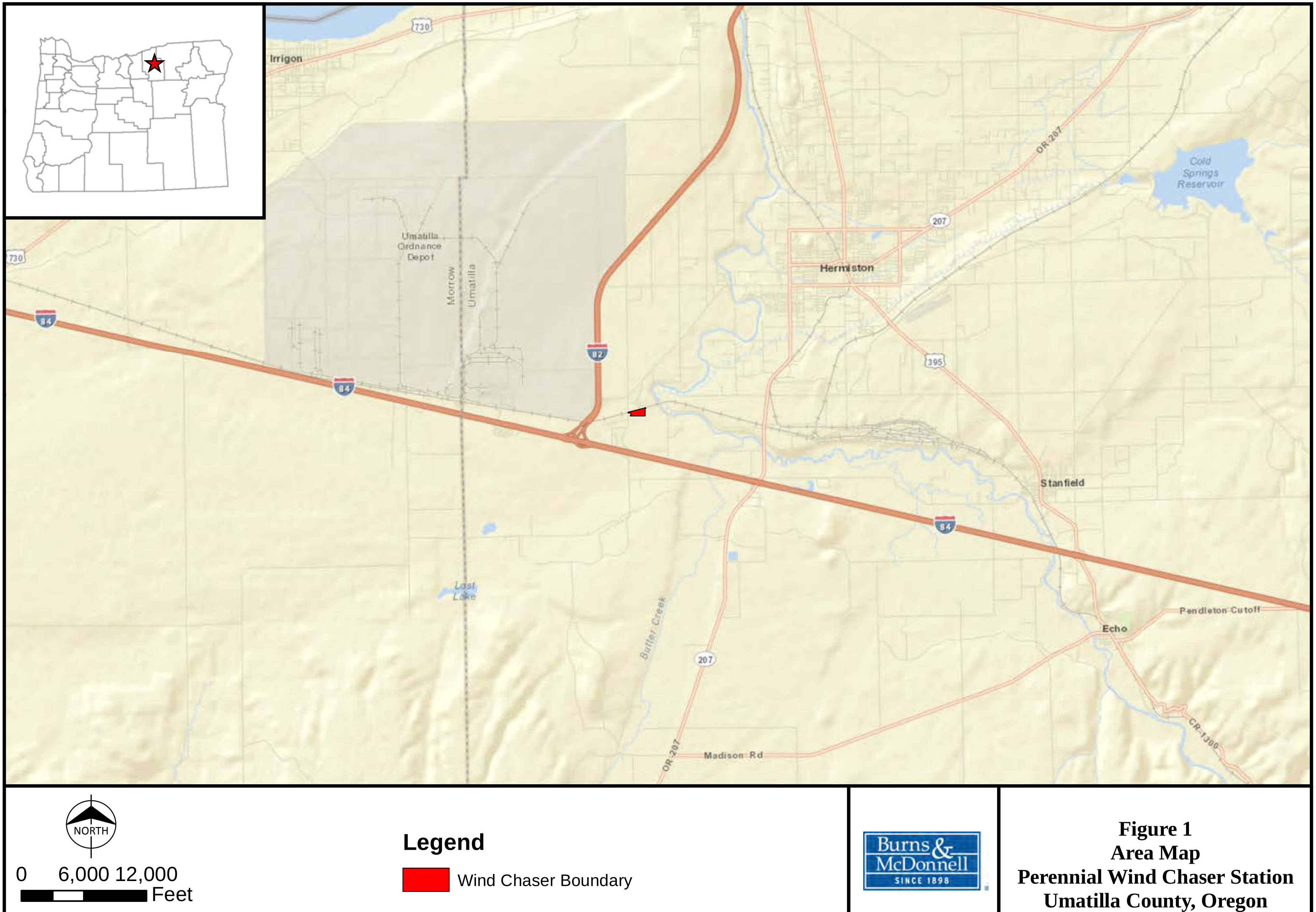

Scale: 1 Inch = 12,000 Feet

Legend

Wind Chaser Boundary

Burns & McDonnell SINCE 1898

Figure 1
Area Map
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

Issued: 8/20/2013

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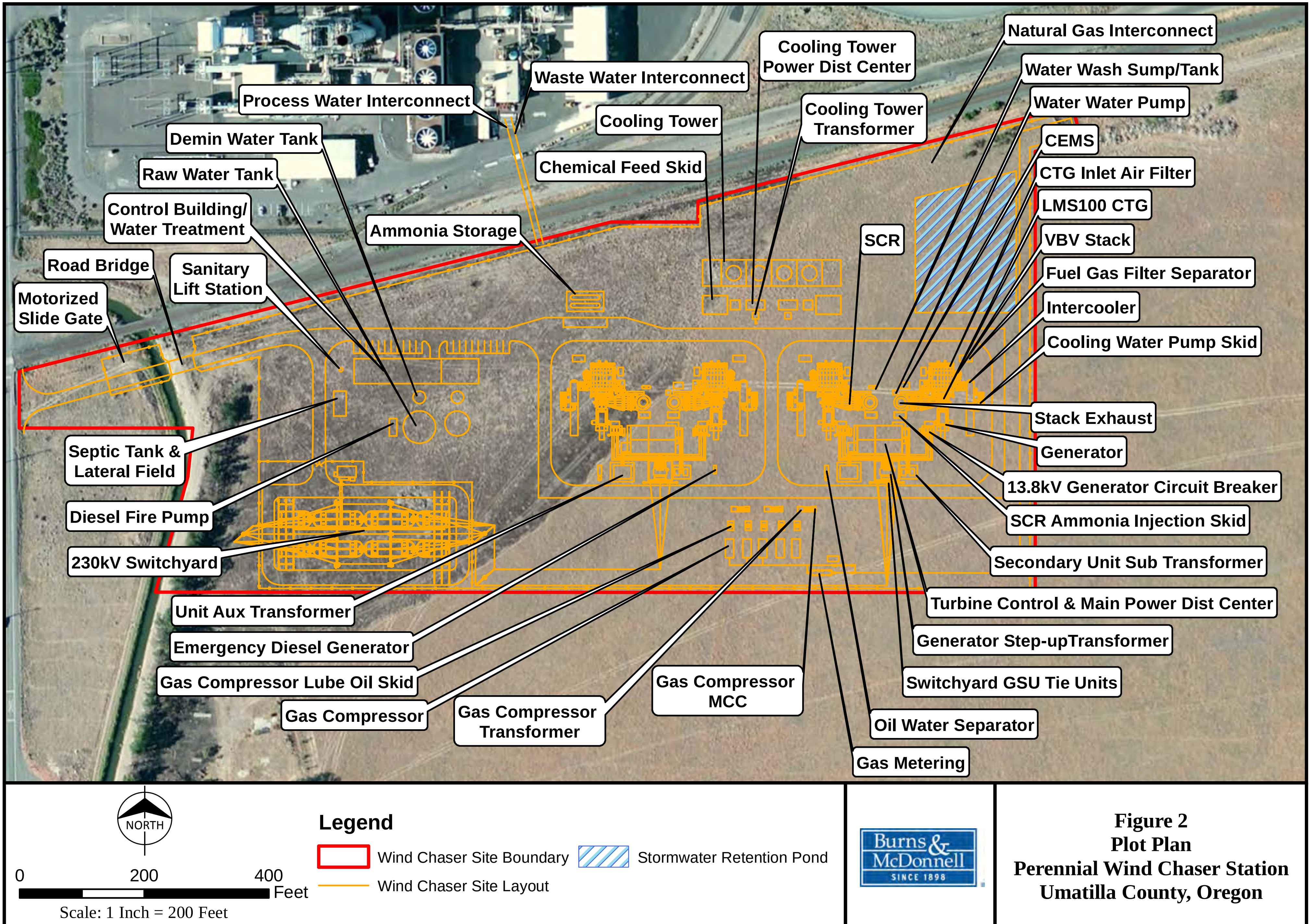


Burns & McDonnell SINCE 1898

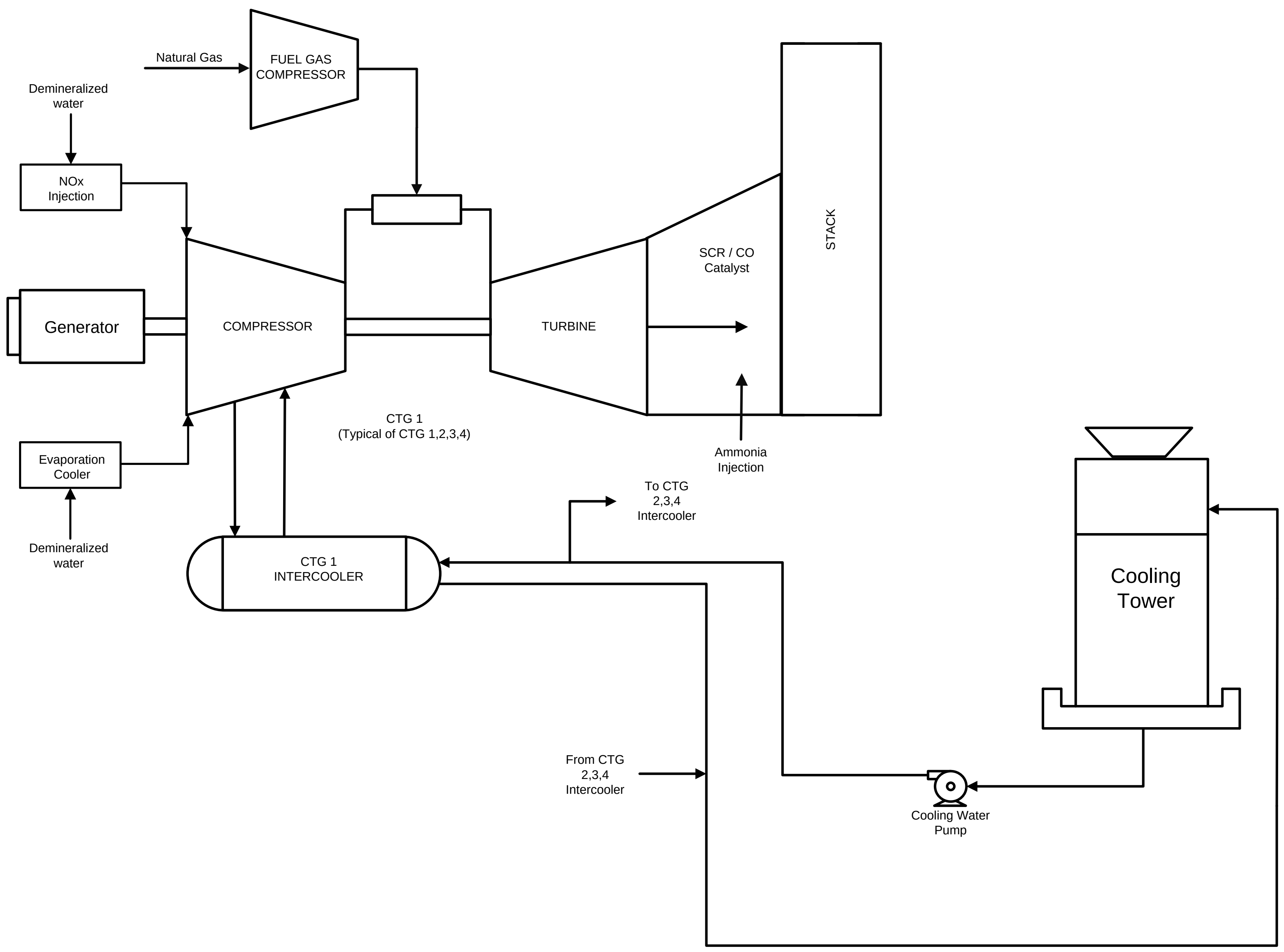
Figure 2
Plot Plan
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co., ORMAP; ESRI; and Burns & McDonnell

Issued: 8/20/2013

PRELIMINARY, NOT FOR GUARANTEE

Diagram is for graphical representation purposes only. Actual equipment arrangement may vary. Not to be used for construction.



REV.	NOTES:	DATE
0	Issued for Application for Site Certificate	4/2/2013

Perennial Wind Chaser Station, Umatilla County, Oregon
4x LMS100 Simple Cycle

Date 4/2/2013
Designed
Detailed K. Sandven
Checked C. Kinsella

Burns & McDonnell SINCE 1898

Figure 3: Process Flow Diagram

Project Perennial Wind Chaser Station

Drawing Figure 3 Rev **0**

Sheet 1 of Sheet 1

3.0 EMISSIONS REVIEW

The table below presents the summary annual emissions expected at the Station. Subsequent parts of this section provide support for estimating the emissions.

Pollutant	Tons per Year
TSP/ PM_{10}/ $PM_{2.5}$	58.7
NO_X	111.0
CO	213.1
VOC	33.5
SO_2	5.4
Sulfuric Acid Mist	4.1
Formaldehyde	1.3
Total HAPs	1.8
CO_2	1,048,408
Methane	77
N_2O	27
Equivalent CO_{2e}	1,058,349
Ammonia	111.5

3.1 Emissions Units

The following units are the proposed sources of air emissions at the Station:

(a) Combustion Turbine Generator #1
(b) Combustion Turbine Generator #2
(c) Combustion Turbine Generator #3
(d) Combustion Turbine Generator #4
(e) One Cooling Tower
(f) One Diesel Powered Emergency Generator
(g) One Diesel Fire Pump

The following air pollution control devices are proposed for the emissions units:

(a) Combustion Turbine #1 will have a selective catalytic reduction (SCR) system for control of NO_X and a catalytic oxidation system for the control of CO.
(b) Combustion Turbine #2 will have a SCR system for control of NO_X and a catalytic oxidation system for the control of CO.
(c) Combustion Turbine #3 will have a SCR system for control of NO_X and a catalytic oxidation system for the control of CO.
(d) Combustion Turbine #4 will have a SCR system for control of NO_X and a catalytic oxidation system for the control of CO.
(e) Cooling Tower will have a high efficiency drift eliminator for control of particulate.

The Emergency Generator and the Diesel Fire Pump emissions will be limited to the applicable Tier standard for each engine category.

Normally, the method of estimating emissions is to derive an hourly emission rate and multiply that by the number of hours a unit is expected to operate. Thus, the number of hours can become a limiting condition of operation. This has been the system for base-loaded facilities and for peaking facilities. However, The Station's emissions units will be operated in a manner much different from the emissions units at standard base-loaded and peaking facilities. These emissions units will be used for complementing the wind generated energy originating in the Columbia Plateau. Loads will be variable and on a short term basis. The Station could operate from a range of 50 MW (1 turbine 50% load) to 415 MW (all 4 turbines at 100% load), with each hour being different from the last. The Station will be designed to operate 4,400 hours per year at full power load equivalent and emissions have been calculated in the preceding sections with this basis in mind.

Thus, utilizing the standard approach of controlling by operational hours without consideration of the variable load would disadvantageously limit the Station from fully complementing the wind generated energy derived in the Columbia Plateau. On the other hand, permitting for an 8,760 hour condition, not only would overestimate the emissions, but it would result in mischaracterization of the units on an energy contract basis.

DOE has acknowledged this limiting aspect of hourly limitations and has defined "non-base load power plant" in Oregon Administrative Rules (OAR) 345-001-0010(40) as follows:

> "Non-base load power plant means a fossil-fueled generating facility that is limited by the site certificate to an average number of hours of operation per year of not more than 6,600 hours. For a non-base load power plant designed to operate at variable load, the facility's annual hours of operation are determined by dividing the actual annual electric output of the facility in megawatt-hours by the facility's nominal electric generating capacity in megawatts."

Perennial would like to have the same operational condition or a similar condition that would allow for the consideration of a variable load, i.e. a limit of 4,400 hours is acceptable as long as the Station's annual hours of operation are determined by dividing the actual annual electric output of the Station in megawatt-hours by the Station's nominal electric generating capacity in megawatts.

3.2 Facility Emissions Factors

Nominal Power Output:	415 MW
Hours of Operation:	4,400 hours
Annual Power Output:	1,826,000 MW
Total Hours (including startup & shutdown)	4,736 hours

Note that for NO_x, CO, and VOCs, the emissions are provided on a part per million (ppm) basis. On a pound per hour (lb/hr) basis, the resultant emissions are dependent upon the temperature and load conditions at which the turbines are operating. Based on the results of the screening modeling, Perennial has chosen the highest lb/hr emissions of the five different ambient cases reviewed as the default short-term emission rate. The highest emission rate will be used with the worst-case turbine stack parameter to assess the ambient air quality impacts. Please refer to the screening analysis of the air dispersion modeling study for details regarding the various ambient cases.

3.2.1 Particulate Emissions (TSP/PM_{10}/$PM_{2.5}$)

Particulate emissions include particulate matter, particulate matter of 10 microns in diameter or smaller (PM_{10}) and particulate matter of 2.5 microns in diameter or smaller ($PM_{2.5}$).

Combustion Turbines (#1-#4)
Normal Operation (GE guaranteed) – 6 lb/hr – 13.2 tpy each turbine
Startups – 500 per year – 30 minutes per event – 6 lb/hr – 0.75 tpy each turbine
Shutdowns – 500 per year – 10.32 minutes per event – 6 lb/hr – 0.26 tpy each turbine
Particulate Emissions – total for four turbines: 56.832 tpy

Cooling Tower
Circulation Rate – 28,000 gpm
Drift Efficiency – 0.0005%
TDS Level – 1000 ppm
Hours (of operation) – 5236 (4400+336+500)
Particulate Emissions – total: 1.83 tpy

Emergency Generator
Expect to use EPA highest Tier engine available for its classification
Based on Tier 3 limitation – 0.2 grams/KW-hr
Engine Size – 500 KW
Hours (of operation) – 100 hr/yr
Particulate Emissions – 22 lb/yr

Fire Pump
Expect to use EPA highest Tier engine available for its classification
Based on Tier 3 limitation– 0.2 grams/KW-hr
Engine Size – 280 KW
Hours (of operation) – 100 hr/yr
Particulate Emissions – 12 lb/yr

Total Facility Particulate Emissions: 58.7 tpy

Note that Particulate Emissions from fugitive and other potential sources are expected to be insignificant.

3.2.2 NO_X Emissions

Combustion Turbines (#1-#4)
Normal Operation (2.5 ppm @ 15% O_2) – 8.57 lb/hr – 18.854 tpy each turbine
Startups – 500 per year – 30 minutes per event – 250 hours – 62.56 lb/hr – 7.82 tpy each turbine

Shutdowns –500 per year – 10.32 minutes per event – 86 hours – 23.09 lb/hr - 0.993 tpy each turbine
NO_X Emissions – total for four turbines: 110.668 tpy

Emergency Generator
Based on Tier 3 limitation – 3.9 grams/KW-hr
Engine Size – 500 KW
Hours (of operation) – 100 hr/yr
NO_X Emissions – 430 lb/yr

Fire Pump
Based on Tier 3 limitation– 3.9 grams/KW-hr
Engine Size – 280 KW
Hours (of operation) – 100 hr/yr
NO_X Emissions –241 lb/yr

Total Facility NO_X Emissions: 111.0 tpy

3.2.3 CO Emissions

Combustion Turbines (#1-#4)
Normal Operation (6.0 ppm @ 15% O_2) – 12.52 lb/hr – 27.544 tpy
Startups – 250 hours – 176.26 lb/hr – 22.033 tpy
Shutdowns – 86 hours – 84.48 lb/hr - 3.633 tpy
CO Emissions – total for four turbines: 212.834 tpy

Emergency Generator
Based on Tier 3 limitation– 3.5 grams/KW-hr
Engine Size – 500 KW
Hours (of operation) – 100 hr/yr
CO Emissions – 385 lb/yr

Fire Pump
Based on Tier 3 limitation – 3.5 grams/KW-hr
Engine Size – 280 KW
Hours (of operation) – 100 hr/yr
CO Emissions – 216 lb/yr

Total Facility CO Emissions: 213.1 tpy

3.2.4 VOC Emissions

Combustion Turbines (#1-#4)
Normal Operation (3.0 ppm @ 15% O_2) – 3.58 lb/hr – 7.876 tpy
Startups – 250 hours – 3.63 lb/hr – 0.454 tpy

Shutdowns – 86 hours – 1.22 lb/hr – 0.052 tpy
VOC Emissions – total for four turbines: 33.529 tpy

Emergency Generator
Based on Tier 3 limitation– 0.1 grams/KW-hr
Engine Size – 500 KW
Hours (of operation) – 100 hr/yr
VOC Emissions – 11 lb/yr

Fire Pump
Based on Tier 3 limitation– 0.1 grams/KW-hr
Engine Size – 280 KW
Hours (of operation) – 100 hr/yr
VOC Emissions – 6 lb/yr

Total Facility VOC Emissions: 33.5 tpy

3.2.5 SO_2 Emissions

Sulfur dioxide (SO_2) emissions are based on sulfur content in the fuel:

Natural gas (sulfur content) – 0.2142 grains/100 SCF
Diesel (sulfur content) – 15 ppm (by weight)

The natural gas sulfur level is based on the historic levels measured at the Hermiston Generation Plant. This is equivalent to 0.0006 lbs SO_2/MMBtu. A sulfur level of 1 grain/100 SCF is used for short term modeling review.

Combustion Turbines (#1-#4)
Normal Operation – 0.2142 grains/100 SCF – 0.567 lb/hr – 1.25 tpy
Startups – 250 hours – 0.567 lb/hr – 0.071 tpy
Shutdowns – 250 hours – 0.567 lb/hr – 0.025 tpy
SO_2 Emissions – total for four turbines: 5.40 tpy

Emergency Generator
Based on 36.6 gallons/hour fuel use
Engine Size – 500 KW
Hours (of operation) – 100 hr/yr
Diesel Fuel Density – 7.05 lb/gallon
SO_2 Emissions – 0.8 lb/yr

Fire Pump
Based on 18.8 gallons/hour fuel use
Engine Size – 280 KW
Hours (of operation) – 100 hr/yr

Diesel Fuel Density – 7.05 lb/gallon
SO_2 Emissions – 0.4 lb/yr

Total Facility SO_2 Emissions: 5.4 tpy

3.2.6 Sulfuric Acid Mist Emissions

Fifty percent of the SO_2 is expected to be oxidized to sulfuric acid mist (SAM). Note that the SO_2 emissions were not adjusted for the conversion of SO_2 to SAM. The conversion factor for SO_2 to SAM is 0.766.

Combustion Turbines (#1-#4)
SAM Emissions – 0.434 lb/hr – total for four turbines: 4.11 tpy

Emergency Generator
SAM Emissions – 0.6 lb/yr

Fire Pump
SAM Emissions – 0.3 lb/yr

Total Facility SAM Emissions: 4.1 tpy

3.2.7 Formaldehyde Emissions

Eighty percent of the formaldehyde potentially emitted by the combustion turbines is expected to be controlled by the catalytic oxidation system. Uncontrolled emissions are based on AP-42 emission factors.

Combustion Turbines (#1-#4)
7.1 E-4 lbs formaldehyde/MMBtu (reference: Table 3.1-3 of AP-42)
945 MMBtu/hr HHV
4736 total hours of operations annually (including startups & shutdowns)
Formaldehyde Emissions – 1.27 tpy

Emergency Generator
1.18 E-3 lbs formaldehyde/MMBtu (reference: Table 3.3-2 of AP-42)
100 total hours of operations annually
36.6 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb– 498 MMBtu/yr
Formaldehyde Emissions –0.6 lbs/yr

Fire Pump
1.18 E-3 lbs formaldehyde/MMBtu (reference: Table 3.3-2 of AP-42)
100 total hours of operations annually
18.8 gallons/hour – 7.09 lbs/gallon – 19,300 Btu/lb– 256 MMBtu/yr

Formaldehyde Emissions –0.3 lbs/yr

Total Facility Formaldehyde Emissions: 1.3 tpy

3.2.8 Total HAPs Emissions

Eighty percent of the total HAPs potentially emitted by the combustion turbines are expected to be controlled by the catalytic oxidation system. Uncontrolled emissions are based on AP-42 emission factors. For ease of review, total HAPs emissions factors listed in AP-42 were summed into one value, including Formaldehyde, which is the highest emitting HAP. Note that for the engines, summed AP-42 Table 3.3-2, Propylene was not included because it is not a HAP.

Combustion Turbines (#1-#4)
1.03 E-3 lbs total HAPs/MMBtu (reference: summed Table 3.1-3 of AP-42)
945 MMBtu/hr HHV
4736 total hours of operations annually (including startups & shutdowns)
Total HAPs Emissions –1.84 tpy

Emergency Generator
0.00387 lbs total HAPs/MMBtu (reference: summed Table 3.3-2 of AP-42)
100 total hours of operations annually
36.6 gallons/hour – 7.09 lbs/gallon – 19,300 Btu/lb
Total HAPs Emissions –1.9 lbs/yr

Fire Pump
0.00387 lbs total HAPs/MMBtu (reference: summed Table 3.3-2 of AP-42)
100 total hours of operations annually
18.8 gallons/hour – 7.09 lbs/gallon – 19,300 Btu/lb
Total HAPs Emissions – total for four turbines: 1.0 lbs/yr

Total Facility HAPs Emissions: 1.8 tpy

3.2.9 CO_2 Emissions

Based on the analysis of the natural gas that is being supplied to HGP, (1015.8 Btu/scf HHV, 96.4758 vol% methane, 1.997 vol% ethane, 0.1159 vol% propane, 0.0209 vol% butane, 0.0013 vol% pentane, and 0.7385 vol% CO_2) a CO_2 emission factor of 117.12 lbs CO_2/MMBtu has been calculated at a peak operation.

Combustion Turbines (#1-#4)
Annual Average Operations at 945 MMBtu/hr - 117.12 lbs CO_2/MMBtu – 243,492 tpy
Startups and Shutdowns – 336 hours – 18,594 tpy
CO_2 Emissions – total for four turbines: 1,048,346 tpy

Emergency Generator
CO_2 emissions factor based on 164 lbs CO_2/MMBtu – (reference: Table 3.3-1 of AP-42)
36.6 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
CO_2 Emissions – 40.8 tpy

Fire Pump
CO_2 emissions factor based on 164 lbs CO_2/MMBtu – (reference: Table 3.3-1 of AP-42)
18.8 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
CO_2 Emissions – 21 tpy

Total Facility CO_2 Emissions: 1,048,408 tpy

3.2.10 Methane Emissions

Methane is a greenhouse gas with a global warming potential (GWP) of 21 (EPA). The emission factor of 8.6 E-3 lbs/MMBtu is based on Table 3.1-2a of AP-42 for the turbines. 40 CFR 98 Table C-2 was used for the engines. Emissions are also presented on equivalent CO_2 units (eCO_2) basis. No fugitive methane emissions are expected.

Combustion Turbines (#1-#4)
Annual Average Operations at 945 MMBtu/hr – 8.6 E-3 lbs Methane/MMBtu – 17.9 tpy
Startups and Shutdowns – 336 hours – 1.4 tpy
Methane Emissions – total for four turbines: 77 tpy

Emergency Generator
Methane emissions factor based on 4.17E-4 kg Methane/MMBtu – (Table C-2 of 40 CFR Part 98)
36.6 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
Methane Emissions – 0.002 tpy

Fire Pump
Methane emissions factor based on 4.17E-4 kg Methane/ MMBtu – (Table C-2 of 40 CFR Part 98)
18.8 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
Methane Emissions – 0.001 tpy

Total Facility Methane Emissions: 77 tpy

Total Facility eCO_2 Emissions – Methane form: 1,617 tpy

3.2.11 N_2O Emissions

Nitrous oxide (N_2O) is a greenhouse gas with a global warming potential (GWP) of 310 (EPA). The emission factor of 3.0 E-3 lbs/MMBtu is based on Table 3.1-2a of AP-42. 40 CFR 98 Table

C-2 was used for the engines. Emissions are also presented on equivalent CO_2 units (eCO_2) basis.

Combustion Turbines (#1-#4)
Normal Operations at 945 MMBtu/hr – 3.0 E-3 lbs N_2O/MMBtu – 6.24 tpy
Startups and Shutdowns – 336 hours– 0.48 tpy
Nitrous Oxide Emissions – total for four turbines: 26.9 tpy

Emergency Generator
Nitrous Oxide emissions factor based on 6.0 E-4 kg/ MMBtu – (Table C-2 of 40 CFR Part 98)
36.6 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
Nitrous Oxide Emissions – 0.0003 tpy

Fire Pump
Nitrous Oxide emissions factor based on 6.0 E-4 kg/ MMBtu – (Table C-2 of 40 CFR Part 98)
18.8 gallons/hour – 7.05 lbs/gallon – 19,300 Btu/lb
Nitrous Oxide Emissions – 0.0002 tpy

Total Facility N_2O Emissions: 27 tpy

Total Facility eCO_2 Emissions – N_2O form: 8,325 tpy

3.2.12 Equivalent CO_2 Emissions

Combustion Turbines (#1-#4)

Total Facility CO_2 Emissions – total for four turbines & other engines: 1,048,408 tpy
Total Facility eCO_2 Emissions – Methane form — total for four turbines: 1,617 tpy
Total Facility eCO_2 Emissions – N_2O form – total for four turbines: 8,325 tpy

Total Facility eCO_2 Emissions from all forms: 1,058,349 tpy

3.2.13 Other Pollutants

Ammonia emissions are the only other significant pollutant expected to be emitted at the Station. Ammonia emissions, in the form of ammonia slip, are due to the use of SCR for NO_X control. On average, the expected ammonia slip for the Station will be approximately 10 ppm (11.77 lbs/hr). Total annual hours of operation of 4736 hours with startups and shutdowns provides a total facility ammonia emission rate of 111.5 tpy.

4.0 REGULATORY REVIEW

4.1 New Source Review Applicability

The Wind Chaser Station and the Hermiston Generating Plant constitute a single source for purposes of determining applicability of Oregon's New Source Review program. OAR 340-200-0020(128) defines a "source" as meaning,

"…any building, structure, facility, installation or combination thereof that emits or is capable of emitting air contaminants to the atmosphere, is located on one or more contiguous or adjacent properties and is owned or operated by the same person or by persons under common control. The term includes all pollutant emitting activities that belong to a single major industrial group (i.e., that have the same two-digit code) as described in the Standard Industrial Classification Manual, (U.S. Office of Management and Budget, 1987) or that support the major industrial group."

The Station is proposed to be sited next to HGP with the Union Pacific railroad right-of-way separating the two facilities, with the following interconnections:

- Tie-in of the reclaimed water from the Station to the cooling tower basins of HGP as makeup water, and
- Tie-in to the process water supply line of the Port of Umatilla, which supplies HGP, and
- Process controls may also have interconnections between the facilities.

This indicates inclusion with the location criterion. Subsidiaries of Perennial Power Holdings, Inc. will be operating both facilities. This satisfies the common control criterion. The Station and HGP both share the same two-digit SIC code (49), thus meeting the final criterion. Therefore, the Wind Chaser Station will be considered as a modification to the existing Hermiston Generating Plant. However, the facilities will be owned by different companies, thus the request that separate permits be issued, both for construction and also for operation (Title V Operating Permit).

The next step in evaluating a project under Oregon's NSR rules is assessing the attainment status of the area with regard to air quality. The air quality in Umatilla County is designated as attainment or as unclassified for all criteria pollutants, therefore only Oregon's PSD rules apply to the project.

Hermiston Generating Plant is classified as a federal major source as defined by Oregon's NSR program since it has the potential to emit a regulated air pollutant in excess of 250 tons per year.

A major modification is defined as any physical change or change of operation of a source that results in (1) an increase in the Plant Site Emission Limit by an amount equal to or more than the significant emission rate over the netting basis, and (2) the accumulation of physical changes and changes in operation since the baseline period that would result in a significant emission rate increase. Both criteria must be satisfied for the change to be deemed a major modification on a pollutant by pollutant basis.

The Review Report for HGP's Renewal Title V Permit (located in Sections 2.2 and 2.3 of the Permit) provides the following tables pertaining to baseline and netting emissions:

PLANT SITE EMISSIONS LIMITS

22. Provided below is a summary of the baseline emissions rate, netting basis, plant site emissions limits, and emissions capacity.

Pollutant	*Baseline Emission Rate (tons/yr)*	*Netting Basis*		*Plant Site Emission Limit (PSEL)*		
		Previous (tons/yr)	Proposed (tons/yr)	Previous (tons/yr)	Proposed (tons/yr)	Increase (tons/yr)
$PM/PM_{10}/PM_{2.5}$	0	64	64	64	64	0
CO	0	447	447	447	447	0
NO_X	0	272	272	272	272	0
SO_2	0	0	0	39	39	0
VOC	0	0	0	39	39	0
GHG	1,680,000	NA	1,680,000	NA	1,768,000	88,000

Note: Information taken from HGP Renewal Title V Permit Review Report

23. The proposed PSEL is not greater than the previous netting basis as shown below except for GHGs. The GHG PSEL is greater than the baseline emission rate due to the use of existing capacity, not a physical change or change in the method of operation.

Pollutant	*SER*	*Increase Over Previous Netting Basis*	*Increase Due to Rule Revisions*	*Increase Due to Physical Changes or Changes in the Method of Operation*
PM	25	0	NA	NA
PM_{10}	15	0	NA	NA
$PM_{2.5}$	10	0	NA	NA
CO	100	0	NA	NA
NO_X	40	0	NA	NA
SO_2	40	39	28	11
VOC	40	39	5	34
GHG	75,000	88,000	NA	0

Note: Information taken from HGP Renewal Title V Permit Review Report

It should be noted that there have been no physical changes or modifications at HGP. For SO_2, HGP requests that netting increase be decreased to 33 tons/yr from 39 tons/yr. On average, SO_2 emissions from HGP are less than 10 tons/yr. The table below shows the total emissions increases with the addition of the Wind Chaser Station (units in tons per year):

Pollutant	**SER (tpy)**	**HGP Netting Increase**	**Wind Chaser Increase**	**Total Increase**	**Exceed SER?**
PM	25	0	59	59	Yes
PM_{10}	15	0	59	59	Yes
$PM_{2.5}$	10	0	59	59	Yes
CO	100	0	213	213	Yes
NO_X	40	0	111	111	Yes
SO_2	40	33	6	39	No
VOC	40	39	34	73	Yes
GHG	75,000	88,000	1,058,349	1,146,349	Yes
H_2SO_4	7	NA	4	4	No

As a result, the Wind Chaser Station is considered a major modification for all of the listed pollutants, except for SO_2 and H_2SO_4, and the remaining requirements of the PSD rules apply to these pollutants. In addition, DEQ has requested that a BACT analysis for VOC emissions be conducted for the turbines at HGP. This analysis is presented in Section 5.3.3 of this report.

4.2 Best Available Control Technology

Oregon air rules require that proposed major modifications at federal major sources employ BACT for each pollutant above significant emission rate (SER). BACT, specifically, applies to (a) each new emissions unit that emits the pollutant in question and was installed since the baseline period or the most recent NSR construction approval, and (b) each modified emissions unit that increases the actual emissions of the pollutant above the netting basis. The only new emission units installed since the last NSR approval are those associated with the Wind Chaser Station. No emission units at HGP have been modified. Thus, BACT is applicable to the above noted pollutants emitting from the Wind Chaser Station, except for SO_2 and H_2SO_4. However, as noted above, a BACT review has been conducted for the VOC emissions at HGP (Section 5.3.3).

Based on EPA BACT/LEAR Clearinghouse and other BACT sources with a focus on LMS100 simple-cycle, and a top down BACT analysis, Perennial proposes the following BACT for the four turbine units:

- Selective Catalytic Reduction for NO_X at 2.5 ppm (3-hour average)
- Good Engineering Practices Combustion Procedures and utility grade natural gas for $TSP/PM_{10}/PM_{2.5}$ and SO_2,
- Oxidation Catalyst for CO and VOC, at 6.0 and 3.0 ppm, respectively.
- Energy efficient equipment for GHG.

$TSP/PM_{10}/PM_{2.5}$ emissions from the cooling tower will be controlled with high efficiency drift eliminators with a drift rate of 0.0005%. The BACT analysis and discussion of control alternatives for all of the proposed emission units is presented in Section 5 of this application.

4.3 Ambient Air Quality Analysis

A dispersion modeling analysis is required for the following pollutants: $TSP/PM_{10}/PM_{2.5}$, CO, NO_X, and SO_2. The dispersion modeling analysis is conducted to demonstrate that impacts from these pollutants comply with National Ambient Air Quality Standards (NAAQS), PSD Increments, and Air Quality Related Values (AQRVs) (e.g., deposition and visibility) as they apply to Class I and Class II Areas.

4.3.1 Non-Attainment and Maintenance Area Review

Oregon regulations require a review of a project's potential air quality impact upon Oregon's non-attainment and maintenance areas. If a project has the potential to have a significant impact upon the area's air quality, then offsets are required for that pollutant.

For determining if a project has an adverse impact on an ozone non-attainment or maintenance area, Oregon allows use of a distance formula. The formula is presented below:

$$D = (Q/40)\ x\ 30\ km$$

where,

$$D = ozone\ precursor\ distance\ (km - D\ not\ to\ exceed\ 100\ km)$$

$$Q = the\ larger\ of\ the\ NOx\ or\ VOC\ emission\ increase$$
$$from\ the\ source\ being\ evaluated\ (tons/year)$$

For the Wind Chaser Station, NO_X emissions are estimated to total 111 tons per year (tpy) and VOC emissions are estimated to total 34 tpy. With the 111 tpy NO_X emissions, D becomes approximately 83 km. Oregon has no ozone non-attainment areas, but it does have two ozone maintenance areas. Their general distances from the Station are shown below:

Portland Ozone Maintenance Area:	260 km
Salem Ozone Maintenance Area:	302 km

Since the area distances are greater than the ozone precursor distances of 83 km, the Wind Chaser Station is not expected to have an adverse air quality impact.

For the other air quality pollutants, Oregon allows dispersion modeling to assess a project's impact upon Oregon non-attainment and maintenance areas. If the dispersion modeling shows concentrations greater than the significant impact level (SIL), then, in general, offsets are required for that pollutant. The SILs are presented below:

Pollutant			
PM_{10}	1.0	µg/m^3	Annual average
	5.0	µg/m^3	24-hour average
$PM_{2.5}$	0.3	µg/m^3	Annual average
	1.2	µg/m^3	24-hour average
CO	500	µg/m^3	8-hour average
	2000	µg/m^3	1-hour average

Oregon non-attainment and maintenance areas for the other pollutants and general distances from the project are presented following:

Pollutant	**Non-Attainment/Maintenance Area**	**Distance (in kilometers)**
$PM_{2.5}$	Oakridge Non-attainment Area	334
PM_{10}	La Grande Maintenance Area	112
PM_{10}	Oakridge Non-attainment Area	334

Pollutant	Non-Attainment/Maintenance Area	Distance (in kilometers)
PM_{10}	Eugene-Springfield Non-attainment Area	352
PM_{10}	Lakeview Maintenance Area	408
PM_{10}	Klamath Falls Maintenance Area	440
PM_{10}	Medford Maintenance Area	475
PM_{10}	Grants Pass Maintenance Area	487
CO	Portland Maintenance Area	260
CO	Salem Maintenance Area	302
CO	Eugene –Springfield Non-attainment & Maintenance Area	352
CO	Klamath Falls Non-attainment & Maintenance Area	440
CO	Medford-Ashford Maintenance Area	475
CO	Grants Pass Maintenance Area	487

The dispersion modeling presented in Section 6 of this report, indicates potential air quality impacts significantly below the SILs for each of the Non-Attainment and Maintenance Areas. Thus the project will not have an adverse impact.

4.3.2 Air Quality Review

Oregon regulations require ambient air quality monitoring if the project potentially emits at or above a significant emission rate (SER). PM_{10}, $PM_{2.5}$, NO_X, CO, and Sulfur Dioxide (SO_2) are all potentially emitted above the SER. However, the Department may exempt the owners of a proposed source if the air quality impacts from the emissions increases are less than the significant monitoring concentration (SMC) amounts, as listed below:

Pollutant			
PM_{10}	10	µg/m^3	24-hour average
$PM_{2.5}$*	4	µg/m^3	24-hour average
NO_2	14	µg/m^3	Annual average
CO	575	µg/m^3	8-hour average
SO_2	13	µg/m^3	24-hour average

* $PM_{2.5}$ SMCs as well as the SILs have been vacated by EPA. As per DEQ requirements, the vacated values will be used on this project.

The dispersion modeling presented in Section 6 of this report indicates potential air quality impacts are significantly below the SMC for each of the listed pollutants. Based on this demonstration, Perennial requests that ambient air quality monitoring not be required for the Wind Chaser Station emissions increase.

4.4 New Source Performance Standards

Oregon has adopted by reference New Source Performance Standards (NSPS) established under 40 CFR Part 60. The following NSPS are applicable to the Station.

4.4.1 NSPS Subpart KKKK

Standard of Performance for Stationary Combustion Turbines.
This new source performance standard requires stationary combustion turbines with a heat input equal to or greater than 10 MMBtu/hour based on heating value of the fuel to comply with NO_X, and SO_X emissions standards. The Station has turbines with peak load of 945 MMBtu/hour on a higher heating value (HHV). Load at annual average conditions is estimated to be 935 MMBtu/hour.

Sections 60.4320 and 60.4350 in general require new combustion turbines firing natural gas with a rated heat input greater than 850 MMBtu/hour and using CEMS, to comply with a NO_X standard of 15 ppmvd at 15% O_2 (hourly average on a 4-hour rolling average basis). Perennial is proposing a 2.5 ppmvd emission rate for normal operations; therefore, the turbines are expected to comply with the NO_X emissions standard of this subpart.

Section 60.4330 prohibits sulfur dioxide emissions from the combustion turbines in excess of 0.90 lbs/MW-hour gross output or 0.060 lbs/MMBtu heat input. SO_2 emissions from these combustion turbines are estimated to be 0.00064 lbs/MMBtu, based on the historical natural gas supplied at HGP.

SO_2 emission rates = (0.6 lbs/hr) x (1 hour/945 MMBtu) = 0.00064 lbs/MMBtu
SO_2 emission rates = (0.6 lbs/hr) / (106.9 MW-gross) = 0.0056 lbs/MW-hr

On a short-term peak basis of 1 grain S per 100 SCF:

SO_2 emission rates = (2.65 lbs/hr) x (1 hour/945 MMBtu) = 0.0028 lbs/MMBtu
SO_2 emission rates = (2.65 lbs/hr) / (106.9 MW-gross) = 0.0025 lbs/MW-hr

Therefore, the turbines are expected to be in compliance with the SO_2 limit requirement.

Section 60.4335(b) requires turbines using water injection as an option to install, calibrate, maintain and operate a continuous emission monitoring system (CEMS) consisting of a NO_X monitor and a diluents gas (oxygen) monitor to determine the hourly NO_X emission rate in ppmvd. The combustion turbines will be equipped with a CEMS to monitor NO_X emissions in parts per million and oxygen content in the exhaust gas.

Section 60.4345 requires the CEMS to be installed and certified according to Performance Specification 2 in Appendix B to this part, or according to Appendix A of Part 75 of this chapter. The CEMS for these combustion turbines will be required to go through Relative Accuracy Test Audit (RATA) and all other required certification tests in accordance with 40 CFR Part 75 Appendix A and B.

Section 60.4350 requires turbine operators to use data from CEMS to identify excess emissions in accordance with specific procedures.

Section 60.4365 exempts the requirement to monitor total sulfur content of the fuel if it can be demonstrated through a valid purchase contract, tariff sheet or transportation contract for the fuel that total sulfur content of natural gas used is 20 grains of sulfur or less per 100 standard cubic feet (SCF).TransCanada, the primary supplier of natural gas for the area (www.gastransmissionnw.com/info_post/) lists the gas quality tariff at 10 grains of total sulfur per 100 SCF (Gas Transmission Northwest LLC – FERC Gas Tariff, Section 6.3(1)(b)(4)). Historically, the natural gas has had a sulfur content of 0.2142 grains per 100 SCF. Quarterly records of natural gas sulfur content are to be kept on site to satisfy this requirement.

Section 60.4375 requires submittal of reports of excess emissions and monitor downtime for all periods of unit operation, including startup, shutdown and malfunction.

Section 60.4400 requires that an initial performance test and annual NO_X performance test be conducted in accordance with certain requirements. Annual source tests are not required pursuant to Subpart KKKK for combustion turbine equipment with CEMS.

4.4.2 NSPS Subpart IIII

Standard of Performance for Stationary Compression Ignition Internal Combustion Engines. This new source performance standard requires compression ignition (CI) engines to meet specific emissions limitations. The Station will have a diesel-fired emergency generator and fire pump engines sized at approximately 500 KW and 280 KW respectively. Manufacturers of diesel-fired engines will be supplying certified engines, which will meet the required emission standards. Perennial will purchase engines with the highest Tier available.

Section 60.4205(b) governs emergency generators, however by way of 60.4202(a)(2), these engines must meet the standards listed in 40 CFR 89.112 (Table 1). These emissions standards are listed in Section 5.2.2 of this report.

Section 60.4205(c) governs fire pumps, which means that they will need to meet the emissions limits listed in Table 4 of the subsection. These emissions standards are listed in Section 5.2.2 of this report.

Section 60.4207 requires that the fuel have a maximum sulfur content of 15 ppm and have a minimum Cetane index of 40 or a maximum aromatic content of 35% value. The fire pump will be supplied with the specified ultra low sulfur diesel.

Section 60.4211 requires that maintenance checks and readiness testing of engines be limited to 100 hours per year. Engine testing will be limited to 100 hours per year.

Perennial will purchase an engine certified by the manufacturer and will operate and maintain the engine according to manufacturer's instructions. A non-resettable hour meter will be installed on the unit.

4.4.3 National Emissions Standards for Hazardous Air Pollutants

NESHAPs have been established in 40 CFR Part 63 to control the emissions of hazardous air pollutants (HAPs). NESHAP regulations establish emission standards or work practices for specific types of equipment located at a HAP major source. A HAP major source is a facility with a potential to emit 10 tpy of a single HAP or 25 tpy of a combination of HAPs. The Station is considered co-located with the Hermiston Generating Plant and so the combined HAP emissions are evaluated in determining HAP major source status.

Presented below are the individual (single highest and total) HAP emissions rates for HGP (from its Oregon Title V Operating Permit) and the Station in units of tons per year:

HAP	HGP *(tpy)*	Station *(tpy)*	Total *(tpy)*
Formaldehyde	5.4	1.3	6.7
Total HAPs	11.2	1.8	13.0

The emissions indicate that HGP and the Station are not a major source for HAPs.

EPA has also promulgated emission standards for source categories that are below the major source threshold. These sources are called “area sources”. Review of the regulations indicates that 40 CFR Part 63, Subpart ZZZZ applies to the diesel-fired engines (also referred to as “RICE” engines).

4.5 Acid Rain Program

Each CTG will be subject to the Acid Rain Program as a new source pursuant to 40 CFR §72.6(a)(3)(i), because each CTG has a generating capacity greater than 25 MW. And the CTGs do not qualify for the new units exemption in 40 CFR §72.7. The following elements of the Acid Rain Program apply to each new gas turbine:

Section 40 CFR 72.9(a) requires an application to EPA 24 months prior to the commencement of unit operations.

Section 40 CFR 72.9(c) requires holding emission allowances to cover the SO_2 emissions from the units.

Section 40 CFR 72.10(a) requires monitoring of SO_2, CO_2, and NO_X emissions from each unit.

Section 40 CFR 72.10(c) requires determination and recording the heat input to each unit.

Perennial will install and operate the required equipment and obtain the required emission allowances in compliance with the Acid Rain Program.

4.6 Title V Program

HGP is a major source of air pollutants and has received a Title V Operating Permit from DEQ as required in OAR 314 Division 218.

Perennial will submit a new Title V application for the Station within 12 months of initial startup of operation of the new facility, and requests that the Title V Operating Permits be separate, consistent with the PSD Permit.

4.7 Compliance Assurance Monitoring Program

All Compliance Assurance Monitoring (CAM) program monitoring requirements are satisfied by the NO_X and CO CEM required under Part 75. No additional CAM is required.

4.8 Accidental Release Program

The Accidental Release Program (40 CFR Part 68) requires the preparation and submission to EPA of a Risk Management Plan (RMP) for facilities that store specific substances above a threshold amount. The Station is expected to have approximately 24,000 gallons of 29% aqueous ammonia on site for control of NO_X emissions with its SCR system. This amount is above the threshold for aqueous ammonia. The Station will have prepared and submitted a RMP to EPA prior to the acceptance of aqueous ammonia on site.

4.9 Mandatory Greenhouse Gas Reporting Program

The Mandatory Greenhouse Gas Reporting Program (40 CFR Part 98) requires the monitoring and submission of greenhouse gas (GHG) emissions data. The program applies to the Station and the Station will comply with the reporting requirements.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

A BACT review is required for six classes of pollutants: NO_X, CO, VOC, SO_2, TSP/PM_{10}/$PM_{2.5}$, and GHG. There are basically seven point sources at the project as planned: the four combustion turbine generators (CTGs), the cooling tower, the diesel-fired emergency generator engine, and the diesel-fired emergency firewater pump engine. The combustion turbines will be reviewed for TSP/PM_{10}/$PM_{2.5}$, CO, NO_X, SO_2, VOC and GHG. The cooling tower will be reviewed for TSP/PM_{10}/$PM_{2.5}$. The diesel-fired emergency/fire pump engines will be reviewed as a single combustion source for the same pollutants as the CTGs. In addition, circuit breakers are a potential source of fugitive emissions of sulfur hexafluoride, a potent GHG that is used as an insulator in high-voltage equipment. Accordingly, circuit breakers will also be reviewed for GHG.

5.1 Methodology

A "top-down" BACT analysis requires reviewing the possible control options starting with the best control efficiency. In the course of the BACT analysis, one or more options may be eliminated from consideration because they are demonstrated to be technically infeasible or have unacceptable energy, economic, or environmental impacts on a case-by-case (site-specific) basis. The steps required for a "top-down" BACT review are:

- Identify available control technologies,
- Eliminate technically infeasible options,
- Rank the remaining technologies,
- Evaluate the remaining technologies (regarding economic, energy, and environmental impacts), and
- Select BACT (the most efficient technology that cannot be rejected for economic, energy or environmental impact reasons).

However because of the extensive reviews that have already been conducted on the simple cycle General Electric LMS100 turbines throughout the nation, a more summarized BACT is presented in this section.

The recently permitted Port Westward Project was used as a baseline for this assessment due to the similarity of the facility process (aeroderivative) and equipment (General Electric LMS100). An additional database reviewed was the recent additions to US EPA RACT/BACT/LAER Clearinghouse (RBLC). Note that Port Westward's BACT determinations have not yet been entered into the RBLC.

5.2 BACT Review for NO_X

The project will consist of two classes of sources of NO_X emissions, the four CTGs, and the two diesel-fired emergency/fire pump engines.

5.2.1 NO_X Technology Identification/Review for CTGs

Control technologies employed for reducing NO_X emissions from aeroderivative CTGs are listed in the following bullet items:

- A Selective Catalytic Reduction (SCR) system capable of continuously complying with a limit of 2.5 ppmvd @ 15% oxygen (O_2)
- Water or steam injection in combination with SCR
- Low NO_X burner design (e.g., dry low NO_X (DLN or DLE) combustors)
- Selective Non-Catalytic Reduction (SNCR) capable of continuously complying with a limit of 4.5 ppmvd @ 15% O_2
- An EMx (formerly SCONOx) system capable of continuously complying with a limit of 2.5 ppmvd @ 15% O_2).

A summarized NO_X BACT listing for aeroderivative simple-cycle combustion turbines in this size range is presented in Table 5-1.

Table 5-1 Recent NO_X BACT Determinations for Simple-Cycle Combustion Turbines[1]

Facility	Agency	NO_X Limit[2]	Averaging Period	Control Method Used	Date Permit Issued
Port Westward	DEQ	2.5 ppmvd	3-hrs	Water Injection and SCR	11/1/2010
El Cajon Energy, LLC	SDAPCD	2.5 ppmvd	1-hr	Water Injection and SCR	12/11/2009
Orange Grove Energy, LLC	SDAPCD	2.5 ppmvd	1-hr	Water Injection and SCR	12/4/2008 (FDOC)
Pio Pico Energy Center	SDAPCD	2.5 ppmvd	1-hr	Water Injection and SCR	11/19/2012

Note:
1. El Cajon and Orange Grove utilize GE LM6000-model units except Port Westward and Pio Pico, which utilize GE LMS100 CTG.
2. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.

The RBLC BACT list used for the summary is included in Appendix B. The most stringent NO_X limit in these recent BACT determinations is a 2.5 ppm limit averaged over a 1-hour averaging period, excluding startups and shutdowns. This level is achieved using water injection combustors and SCR. However, these BACT determinations were for facilities located in state nonattainment ozone areas and thus can be considered to be lowest achievable emissions rate (LAER) determinations rather than BACT level determinations.

The SCR system uses ammonia injection to reduce NO_X emissions. SCR systems have been widely used in simple-cycle gas turbine applications of all sizes. The SCR process involves the injection of ammonia into the flue gas stream via an ammonia injection grid upstream of a reducing catalyst. The ammonia reacts with the NO_X in the exhaust stream to form N_2 and water vapor. The catalyst does not require regeneration, but must be replaced periodically; typical SCR catalyst lifetimes are in excess of three years. This is a feasible technology for the project.

Water or steam injection keeps exhaust temperatures controlled, thus moderating the emissions of NO_X. This technology is used with SCR and has been widely used in simple-cycle gas turbine applications. This is a feasible technology for the project.

DLN or DLE combustors have just recently been introduced for the GE LMS100 CTGs. While it is expected to match the emission rates of water injection, energy generation and efficiency is downgraded. At this stage of application, this technology is considered infeasible for the project because it is not yet achievable or proven in practice.

SNCR technology is considered infeasible because the system requires temperatures of 1,700ºF – 2,000ºF, while exhaust temperatures of the LMS100 are in the range of 700ºF - 800ºF.

EMx (formerly SCONOx) is a NO_X reduction system distributed by EmeraChem. This system uses a single catalyst to oxidize both NO and CO, a second catalyst system to absorb NO_2, and then a regeneration system to convert the NO_2 to N_2 and water vapor. The EMx system does not use ammonia as a reagent. EMx has yet to be demonstrated in practice on a combustion turbine large than 50-MW. The EMx process has been demonstrated in practice on much smaller gas turbines, including Redding Electric Utility's (REU) Units 5 and 6, a 43-MW Alstom GTX100 and 45-MW Siemens SGT 800 combined-cycle gas turbines, respectively. This technology is considered infeasible for the project.

Based on the results of the analysis, a NO_X BACT emission rate of 2.5 ppmvd @ 15% O_2 (3-hour average) is proposed, utilizing SCR with water injection.

5.2.2 NO_X Technology Identification/Review for Engines

The only feasible control technology for the diesel-fired emergency engines is NSPS compliant engines due to the low number of operational hours expected (less than 100 hours annually), and the high cost of add-on controls. EPA promulgated 40 CFR Part 60 Subpart IIII (60.4200) on July 11, 2006, (71 FR 39154) on a phased roll-out of operational emission standards for engines, which is currently on-going. It is proposed that BACT for the emergency engines to obtain the highest Tier engine required for the class of engine, "emergency/fire pump", when construction of the project occurs. It is expected that Tier 3 engines will be utilized for the project; emission standards for Tier 3 engines are as follows:

Pollutant	Emissions (fired with 15ppm sulfur diesel fuel)
NO_X + NMHC	4.0 grams/KW-hr
CO	3.5 grams/KW-hr
PM	0.2 grams/KW-hr

5.3 BACT Review for CO and VOC

The project will consist of two classes of sources for CO and VOC emissions, the four CTGs, and the two diesel-fired emergency engines. In addition, a BACT review of the VOC emissions from HGP is presented in Section 5.3.3.

5.3.1 CO and VOC Technology Identification/Review for CTGs

Control technologies employed for reducing CO and VOC emissions emitted from aeroderivative CTGs are listed below:

- Thermal oxidation
- Catalytic oxidation.

A summarized CO and VOC BACT listing for aeroderivative simple-cycle combustion turbines in this size range are presented in Table 5-2. The RBLC BACT list used for the summary is included in Appendix B. The most stringent VOC limits in these recent BACT determinations are a 2.0 ppm limit averaged over a 1-hour averaging period, excluding startups and shutdowns. This level is achieved using catalytic oxidation. However, the BACT determinations were for facilities located in state nonattainment ozone areas and thus can be considered to be LEAR determination rather than BACT level determinations.

Table 5-2 Recent CO/VOC BACT Determinations for Simple-Cycle Combustion Turbine[a]

Facility	Agency	CO Limit[b]	VOC Limit[b]	Averaging Period	Control Method Used	Date Permit Issued
Port Westward	DEQ	6.0 ppmvd	3.0 ppmvd	3-hrs	Catalytic Oxidation	11/1/2010
El Cajon Energy, LLC	SDAPCD	--- ppmvd	2.0 ppmvd	1-hr	Catalytic Oxidation	12/11/2009
Orange Grove Energy, LLC	SDAPCD	6.0 ppmvd[c]	2.0 ppmvd	1-hr (VOC) 3-hr (CO)	Catalytic Oxidation	12/4/2008 (FDOC)
Pio Pico Energy Center	SDAPCD	4.0 ppmvd[c]	2.0 ppmvd[c]	1-hr	Catalytic Oxidation	11/19/2012

Note:
a. El Cajon and Orange Grove utilize GE LM6000-model units; Port Westward and Pio Pico utilize GE LMS100 CTG.
b. All concentrations expressed as parts per million by volume dry, corrected to 15% O_2.
c. Orange Grove and Pio Pico have permit limits noted, but were not listed in the RBLC.

The prevalent CO limit in these recent BACT determinations is a 6.0 ppm limit averaged over a 3-hour averaging period, excluding startups and shutdowns. The RBLC did not list any of the projects above for CO.

In catalytic oxidation, a catalyst is used to oxidize CO and VOC at lower temperatures. The addition of a catalyst to the exhaust stream accelerates the rate of oxidation by absorbing oxygen and CO in the exhaust stream onto the catalyst surface to react to form CO_2 and H_2O. Good combustion practices include providing sufficient excess air (i.e., O_2) for complete combustion and/or staged combustion to complete combustion of CO and VOC, thereby ensuring proper air-to-fuel ratios. These practices are mainly a function of good design; to ensure the necessary temperature, residence time and mixing conditions in the combustion zone of the equipment.

In addition, catalytic oxidation is also known to reduce organic hazardous air pollutants by at least 80% control.

Conversely, thermal oxidation requires higher temperatures (1,000ºF to 2,000ºF) to control CO and VOC, and thus is considered infeasible for the Wind Chaser Station.

Based on the results of the analysis, a CO BACT emission rate of 6.0 ppm @ 15% O_2 (3-hour average) is proposed and a VOC BACT emission rate of 3.0 ppm @ 15% O_2 (3-hour average) is proposed, utilizing catalytic oxidation combined with good combustion practices.

5.3.2 CO and VOC Technology Identification/Review for Engines

The only feasible control technology for the diesel-fired emergency/fire pump engines is NSPS compliant engines. Refer to Section 5.2.2 of this report for additional details.

5.3.3 BACT Review for VOC Emissions at HGP

In the initial PSD application (December 1992 prepared by ENSR) for HGP, a BACT analysis for VOC emissions from the project was conducted. The text of that analysis, which discusses VOC emissions, is presented following:

> 3.6.2 Gas Turbines
>
> 3.6.2.1 Catalytic Oxidation
>
> The most stringent VOC control level for gas turbines has been achieved using catalytic oxidation. According to the list of turbines in the BACT/LAER Clearinghouse with limits on VOC, oxidation catalyst systems have been concluded to represent BACT for VOC control for only 5 of 29 gas turbines with VOC limits listed.
>
> The same technical factors which apply to the use of oxidation catalyst technology for control of CO emissions (narrow operating temperature range, loss of catalyst activity over time, system pressure losses) apply to the use of this technology for control of VOC. Further discussion on these factors can be found in Section 3.3.2. Note, however, that very little VOC is expected to be oxidized below 1,000°F.
>
> According to vendors, a specially formulated catalyst is preferred for VOC oxidation and requires about twice the catalyst required for CO oxidation. The basic equipment cost was scaled from a similar gas turbine combined-cycle system and is shown in Tables 3-15 and 3-16 together with total capital cost and annualized cost. A VOC removal efficiency of 80 percent yields removal of 13.7 tons per year of VOCs per gas turbine. The cost per ton of VOC removed is estimated at $165,800. This is not considered cost-

effective. Therefore the use of an oxidation catalyst is concluded to be economically infeasible, and not representative of BACT for control of VOCs from the gas turbines.

3.6.2.2 Combustion Controls

Conclusions pertaining to use of combustion controls for VOCs are similar to those drawn for control of CO. This control method is proven, reliable, does not result in increased emissions of other pollutants, and has no adverse economic impacts. Total VOC emissions from the two gas turbines will be 34.6 tons per year. Combustion controls have been concluded to represent BACT of 24 of 29 turbines listed with VOC controls in the BACT/LAER Clearinghouse, and as the next most stringent control alternative after catalytic oxidation, is concluded to represent BACT for the gas turbines.

3.6.3 Auxiliary Boiler

3.6.3.1 Catalytic Oxidation

The most stringent VOC control level for boilers has been achieved using catalytic oxidation; however this technology has not been installed on auxiliary gas-fired boilers in this size range due to cost considerations. The low emission rate of VOC from the proposed boiler (6.3 tons per year) and the high capital cost ($1,600,000 as shown in Table 3-17) combine to result in a prohibitive cost-effectiveness, even considering that this alternative could control 80 percent of the VOC emitted from the boiler. The capital cost of this technology includes the incremental cost ($661,000) to custom design the packaged boiler to accommodate VOC catalyst operating at 1,000°F without efficiency penalties. As shown in Table 3-18, the estimated cost-effectiveness of this alternative is $128,800 per ton VOC controlled. Even with the added benefit of removing CO, this is not considered cost-effective, and not representative of BACT for VOC control for the auxiliary boiler.

3.6.3.2 Combustion Controls

As described in Section 2.3.2, the auxiliary boiler will be equipped with high-efficiency burners which will provide for total combustion of the fuel, thereby limiting VOC emissions to about 1.4 lb/hr. This amounts to only 6.3 ton VOC per year emitted from the boiler. These burners do not present any adverse economic, environmental, or energy impacts, and as the next most stringent alternative after catalytic oxidation can be concluded to represent BACT for VOC emissions from the auxiliary boiler.

Since that time, the available control technologies remain the same: catalytic oxidation and combustion controls. As concluded in the earlier BACT analysis, economic costs for catalytic oxidation are prohibitive. In addition, there would now be the added costs associated with retrofitting of the facility and also the costs presented by losses due to non-operation of the facility during retrofitting. Based on the same principles presented in the initial BACT determination, application of catalytic oxidation is still not cost effective. Thus, combustion controls, which have been successfully used since the facility was constructed, are still proposed as BACT for HGP.

5.4 BACT Review for SO_2

The project will consist of two classes of sources for SO_2 emissions, the four CTGs, and the two diesel-fired emergency/fire pump engines.

5.4.1 SO_2 Technology Identification/Review for CTGs

The only feasible method of controlling SO_2 emissions is utilizing pipeline quality natural gas. The Wind Chaser Station is expected to combust natural gas with a sulfur content of 0.2142 grains/100SCF based on an historical analysis at the Hermiston Generating Plant. This level of sulfur content is expected to be a long-term emission rate; the sulfur content of 1.0 grains/100SCF is used as a potential short term emission rate.

5.4.2 SO_2 Technology Identification/Review for Engines

The only feasible control technology for controlling SO_2 emissions from engines is to utilize ultra-low sulfur (15 ppm) diesel fuel. This is proposed as BACT for the engines.

5.5 BACT Review for TSP/PM_{10}/$PM_{2.5}$

The project will consist of three classes of sources for TSP/PM_{10}/$PM_{2.5}$ emissions, the four CTGs, the cooling tower, and the two diesel-fired emergency engines.

5.5.1 TSP/PM_{10}/$PM_{2.5}$ Technology Identification/Review for CTGs

While numerous technologies have been employed at power plants such as coal and biomass, the only feasible method of controlling particulate emissions utilizing aeroderivative CTGs is clean fuel and good combustion practices. Particulate formation (both filterable and condensate) from these engines is dependent upon the sulfur and nitrogen content in the fuel. Natural gas is low in these substances. Therefore, BACT reviews are dependent upon turbine manufacturers guarantees. An emission limitation of 6 lbs/hr from each turbine, as a guarantee by General Electric, is proposed for the Wind Chaser Station; and BACT is proposed as clean fuel and good combustion practices. The proposed emission rate is similar to the BACT emission rate determined for Port Westward (6.3 lb/hr). Pio Pico's BACT emission rate was based on 0.0065 lbs/MMBtu with PUC quality natural gas. The Station's equivalent emission rate is 0.00642 lbs/MMBtu.

5.5.2 TSP/PM_{10}/$PM_{2.5}$ Technology Identification/Review for Cooling Tower

Recirculating wet cooling towers can be a source of particulate due to the release of water droplets from the cooling tower. These water droplets contain dissolved solids, which, when the water evaporates, can become a particulate matter. The release of water droplets from a cooling tower is controlled by drift eliminators. The efficiency of two drift eliminators from recently permitted power plants in Oregon are presented below:

Facility	Efficiency
Port Westward	0.0005%
Carty	0.0005%

Use of high efficiency drift eliminators is still considered BACT and is proposed for the Station.

5.5.3 TSP/PM_{10}/$PM_{2.5}$ Technology Identification/Review for Engines

The only feasible control technology for control of the diesel-fired emergency engines is NSPS compliant engines. Refer to Section 5.2.2 of this report for additional details.

5.6 BACT Review for GHG

The project will consist of three classes of sources for GHG emissions, the four CTGs, the two diesel-fired emergency engines, and the circuit breakers fugitive emissions.

5.6.1 GHG Technology Identification/Review for CTGs

Potential and actual technologies employed for reducing GHG emissions from combustion sources are listed below:

- Carbon capture and storage
- Efficient design and operation of the electrical generating portion of the power plant,
- Efficient design and operation of the auxiliary load portion of the power plant.

Each potential technology is discussed in the following text.

Carbon Capture and Storage

The capture, compression and transportation of CO_2 from the turbine exhaust may be possible from a purely technical evaluation of feasibility, although it has never been performed in practice. Rather than simply rating this technology as infeasible, evolving discussion warrants attention due to the wide-spread interest in this area. The storage aspects of the captured CO_2 are discussed as follows:

Geologic Formations

The geologic formations considered appropriate for CO_2 storage are layers of porous rock deep underground that are "capped" by a layer or multiple layers of non-porous rock above them. In this application, a well is drilled down into the porous rock and pressurized CO_2 is injected into it. Under high pressure, CO_2 turns to liquid and can move through a formation as a fluid. Once injected, the liquid CO_2 tends to be buoyant and will flow upward until it encounters a barrier of non-porous rock, which can trap the CO_2 and prevent further upward migration.

There are other mechanisms for CO_2 trapping as well: CO_2 molecules can dissolve in brine, react with minerals to form solid carbonates, or adsorb into the pores of porous rock. The degree to which a specific underground formation is amenable to CO_2 storage can be difficult to determine. Research is being performed today which is aimed at developing the ability to characterize a formation before CO_2 injection in order to predict its CO_2 storage capacity. Another area of research is the development of CO_2 injection techniques that achieve broad dispersion of CO_2 throughout the formation, overcome low diffusion rates, and avoid fracturing the cap rock.

Several of the major unresolved issues with respect to CO_2 sequestration pertain to the legal framework for closing and remediating sequestration sites, including liability of accidental releases from these sites. Until the financial responsibility issues are defined and codified by the Federal government, companies and most likely states will not undertake commercial geologic CO_2 sequestration activities beyond those states that already have regulations for enhanced oil recovery.

There are several types of geologic formations, some of which are depleted oil and gas reservoirs, un-mineable coal seams, saline formations, and basalt formations. These are formations in which CO_2 can be stored and each presents different opportunities and challenges.

Depleted Oil and Gas Reservoirs
These are formations that held crude oil and natural gas at some time. In general, they are characterized by a layer of porous rock with a layer of non-porous rock that forms a dome. Domes of this type offer great potential to trap CO_2 and make these formations excellent sequestration opportunities.

As a value-added benefit, CO_2 injected into a depleting oil reservoir can enable recovery of additional oil and gas. When injected into a depleted oil bearing formation, the CO_2 dissolves in the trapped oil and reduces its viscosity. This improves the ability of oil to move through the pores in the rock and flow with a pressure differential toward a recovery well. A CO_2 injection typically enables recovery of an additional 10 to 15 percent of the original oil in place. Enhanced oil recovery and enhanced gas recovery are commercial processes and are in demand with recently high commodity prices. It is estimated that 50 to 90 billion metric tons of sequestration potential exists in mature oil and gas reservoirs identified by the Regional Carbon Sequestration Partnerships. There are no known oil or gas reservoirs providing CO_2 sequestration opportunities within the vicinity of the Perennial Wind Chaser Station. Thus, this option is not feasible.

Un-mineable Coal Seams
Un-mineable coal seams are those that are too deep or too thin to be mined economically. All coals have varying amounts of methane adsorbed onto pore surfaces, and wells can be drilled into un-mineable coal beds to recover this coal bed methane (CBM). Initial CBM recovery methods, dewatering and depressurization; leave an appreciable amount of CBM in the reservoir. Additional CBM recovery can be achieved by sweeping the coal bed with nitrogen or CO_2, which preferentially adsorbs onto the surface of the coal, releasing the methane. Two or three molecules of CO_2 are adsorbed for each molecule of methane released, thereby providing an excellent storage sink of CO_2. Like depleting oil reservoirs, un-mineable coal beds are a good early opportunity for CO_2 storage.

One potential barrier to injecting CO_2 into un-mineable coal seams is swelling. When coal adsorbs CO_2, it swells in volume. In an underground formation swelling can cause a sharp drop in permeability, which not only restricts the flow of CO_2 into the formation but also impedes the recovery of displaced CBM. Two possible solutions to this challenge include angled drilling techniques and fracturing.

It is estimated that 150 to 200 billion metric tons of CO_2 sequestration potential exists in un-mineable coal seams identified by the Regional Carbon Sequestration Partnerships. No such seams are known to exist in the vicinity of the Perennial Wind Chaser Station. Thus, this option is not feasible.

Saline Formations
These formations are layers of porous rock that are saturated with brine. They are much more commonplace than coal seams or oil and gas bearing rock, and represent an enormous potential for CO_2 storage capacity. The Regional Carbon Sequestration Partnerships estimate a range of 3,300 to 12,000 billion metric tons of sequestration potential in saline formations. However, much less is known about saline formations than is known about crude oil reservoirs and coal seams, and there is a greater amount of uncertainty associated with their ability to store CO_2. Saline formations contain minerals that could react with injected CO_2 to form solid carbonates. The carbonate reactions have the potential to be both a positive and a negative. They can increase permanence but they also may plug up the formation in the immediate vicinity of an injection well. Additional research is required to better understand these potential obstacles and how best to overcome them. No such saline formations are known to exist in the vicinity of the Perennial Wind Chaser Station. Thus, this option is not feasible.

Basalt Formations
These are geologic formations of solidified lava. Basalt formation has a unique chemical makeup that could potentially convert all of the injected CO_2 to a solid mineral form, thus permanently isolating it from the atmosphere. Current research is focused on enhancing and utilizing the mineralization reactions and increasing CO_2 flow within a basalt formation. Although oil and gas-rich organic shale and basalt research is in its infancy, these formations may, in the future, prove to be optimal storage sites for sequestering CO_2 emissions. This CO_2 sequestration technique is considered technically infeasible for the Perennial Wind Chaser Station.

Efficient Design and Operation of the Electrical Generating Portion of the Power Plant
The more efficient a power plant is, the less fuel is required for electrical generation and thus less GHG emissions are emitted. The typical energy efficiency of several simple cycle turbines that can potentially meet the project's objectives is presented in Table 5-3:

Table 5-3 Ranking of Simple-Cycle Peaking Units by Heat Rate (ISO Conditions)

Machine	Generating Capacity (MW)	Heat Rate (Btu/KW-hr, LHV)
GE LMS100	103	7,815
GE LM6000PC SPRINT	49.6	8,531
Siemens SGT-800	50.5	8,916
P & W FT8 TwinPac	51	9,269

The reason the LMS100 is much more efficient than the other turbines listed is due to the intercooling process, which enhances energy efficiency. Therefore, the utilization of intercooler technology is proposed as BACT. Note that the levels listed in Table 5-3 are not guaranteed performance level, only the nominal value for representative purposes. The BACT clearinghouse lists Pio Pico Energy Center at a limit of 1,328 pounds GHG per MW-hr at 80% load. Also Troutdale Energy Center is proposing a BACT level with a limit of 1,707 pounds CO_2 per gross

MW-hr (365-day rolling average) for their LMS100 simple-cycle operation. Because thermal efficiency with decreasing load and turbine degradation over the life of the facility is not yet established, a BACT limit similar to Troutdale's proposal of 1,707 pounds GHG per gross MW-hr (365-day rolling average) is proposed as the BACT emission rate for the Station.

Efficient Design and Operation of the Auxiliary Load Portion of the Power Plant

The auxiliary load portion of a simple-cycle power plant is a small part of total operations of the power plant. Total output at the generators of the station is expected to be a nominal 424 MW (gross generation) of electricity with 415 MW (net generation) leaving the power plant. Therefore, approximately 10.6 MW (or 2.5%) of the energy produced is utilized for auxiliary loads. Most of the energy is utilized in (1) compressing the inlet air and natural gas, and (2) intercooling aspects of the process. In addition, these aspects are integral to the design and operation of the units; essentially part of a unified process package. Thus, reliance on the inherent energy efficiency of the systems is proposed as BACT for the auxiliary load portion of the power plant.

5.6.2 GHG Technology Identification/Review for Engines

The only feasible control technology for diesel-fired emergency engines is NSPS compliant engines. Refer to Section 5.2.2 of this report for additional details.

5.6.3 GHG Technology Identification/Review for Circuit Breakers

The project's circuit breakers will also have the potential to emit sulfur hexafluoride (SF_6), which has a global warming potential 23,000 times greater than CO_2. The project will not emit SF_6 directly, but only as leaks from the circuit breakers that may occur over time. The technologies potentially employed for control of circuit breaker emissions are listed below:

- Oil/air blast circuit breakers
- Enclosed pressure SF_6 circuit breakers

Oil/air blast circuit breakers are a feasible technology and have been historically used for breaker use at older power plants. However for new power plants SF_6 circuit breakers are used because of their superior capabilities in reliability, efficiency, and environmental impacts (fires and oil spills) over oil/air blast circuit breakers and is resulting in replacement of oil/air blast circuit breakers at the older power plants because of these superior capabilities. Modern SF_6 circuit breakers can now achieve a leak rate of 0.5% or less. This leak rate meets the International Electrotechnical Commission maximum leak rate standard. Performance can be further enhanced with a density alarm system. This system provides a warning when more than 10% by weight has been released as fugitive emissions. This allows for a proactive response prior to a potentially greater release of SF_6. Modern SF_6 circuit breakers with alarm system are proposed as BACT.

6.0 AIR QUALITY IMPACT ANALYSIS

This section describes the methodology and results, in both magnitude and spatial extent of ground level concentrations resulting from emissions from the Station. The modeled concentrations were added to the background concentrations in order to calculate a total impact for comparisons with the NAAQS.

In summary, the air quality analysis was conducted to demonstrate that impacts from NO_x, CO, PM_{10} and $PM_{2.5}$ will comply with the National Ambient Air Quality Standards (NAAQS) and PSD Increments (Class I and Class II) for the applicable averaging periods. Additionally, based on inputs from the Federal Land Managers, no Air Quality Related Values (AQRVs) for nitrogen deposition or visibility were required. Table 6-1 summarizes the proposed analyses on a pollutant specific basis.

The modeling followed procedures as summarized by the January 24^{th} 2013 Air Quality Modeling Protocol for the Perennial Wind Chaser Station. The protocol was approved on March 1^{st}, 2013 by the DEQ. The protocol follows the methodologies as outlined by the DEQ, the United States Environmental Protection Agency (EPA) and Federal Land Managers (FLM) modeling guidelines. The air quality analyses were also prepared based on conversations with Phillip Allen and Mark Bailey (DEQ), John Notar of the National Park Service (NPS) and Rick Graw of the United States Forest Service (USFS). Additional guidance procedures are summarized below: U.S. Environmental Protection Agency (EPA) in its "*Guideline on Air Quality Models*" (including supplements), EPA Memorandum "*Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*" (March 2011), EPA Memorandum "*Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard*" (August 2010), EPA Memorandum "*Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS* (March 2010), the Federal Land Managers' "*Air Quality Related Values Work Group (FLAG) Phase I Report-Revised*" (October 2010), and the "*Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Recommendations*" (1998).

Table 6-1 Air Quality Criteria

	NO_2	PM_{10}	$PM_{2.5}$	CO	SO_2
PSD Significant Impact Levels for Class II Areas	✓	✓	✓	✓	✓
PSD Significant Impact Levels for Class I Areas	✓	✓	✓		
Ambient Air Quality Standards	✓	✓	✓	✓	✓
Class I and Class II Visibility and Deposition	✓	✓	✓		
Impacts to Soils and Vegetation	✓	✓	✓	✓	
Class I and Class II Area Increment	✓	✓	✓		

A copy of the modeling protocol is included in Appendix C. All input and output modeling files are contained on a CD-ROM disk that has been provided to the DEQ. All modeling analyses were performed using the techniques and methods as discussed with the DEQ and USFS through development of a modeling protocol.

6.1 Dispersion Modeling

Several United States Environmental Protection Agency (EPA) dispersion models were used to quantify pollutant impacts on the surrounding environment based on the emission sources, operating parameters and their locations and included the AERMOD modeling system (version 12345) with the associated meteorological and receptor processing programs AERMET version 12345, AERSURFACE version 13016, and AERMAP version 11103). The Building Profile Input Program for PRIME (BPIP-PRIME version 04274) was also used for determining building dimensions for downwash calculations in AERMOD. These models were used for the following:

- Comparison of operational impacts to significant impact levels (SILs), significant monitoring concentrations (SMC), National Ambient Air Quality Standards (NAAQS), and PSD Increments using AERMOD;
- Cumulative NAAQS analyses with AERMOD in accordance with EPA requirements and;
- Assessment of impacts to soil and vegetation

The surface and upper air meteorological data processed in AERMET were five years (1995-1999) of representative surface data collected at the Umatilla Army Depot (Depot) with the upper air data collected in Spokane, Washington. The Depot is located 4.5 kilometers (km) northwest of the Station. These five years of surface data were selected because they are the most representative data available which also meet the minimum 90% data recovery rate requirement (for each calendar year) after combining with concurrent upper-air data. The surface data was provided by the DEQ.

AERMOD input data options are listed below. Use of these options follows the DEQ and EPA modeling guidance: default model option for temperature gradients, wind profile exponents, and calm processing, which includes final plume rise, stack-tip downwash, and elevated receptor (complex terrain) heights option. All sources were modeled as rural sources.

6.2 Model Selection

AERMOD is a steady-state plume dispersion model that simulates transport and dispersion from multiple point, area, or volume sources based on updated characterizations of the atmospheric boundary layer. AERMOD uses Gaussian distributions in the vertical and horizontal for stable conditions, and in the horizontal for convective conditions; the vertical distribution for convective conditions is based on a bi-Gaussian probability density function of the vertical velocity. For elevated terrain AERMOD incorporates the concept of the critical dividing streamline height, in which flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. AERMOD also uses the advanced PRIME algorithm to account for building wake effects.

AERMOD input data options are listed below which follow DEQ and EPA modeling guidance documents.

- Final plume rise
- Stack tip downwash

- Regulatory default option (i.e., calm and missing meteorological data processing and elevated terrain heights option)

As needed for the generation of wind-direction based inputs into AERMOD for effects of downwash impacts on modeled concentrations, the Building Profile Input Program for PRIME (BPIP-PRIME, current version 04274) was also used. These models, along with options for their use and how they are used, are discussed below.

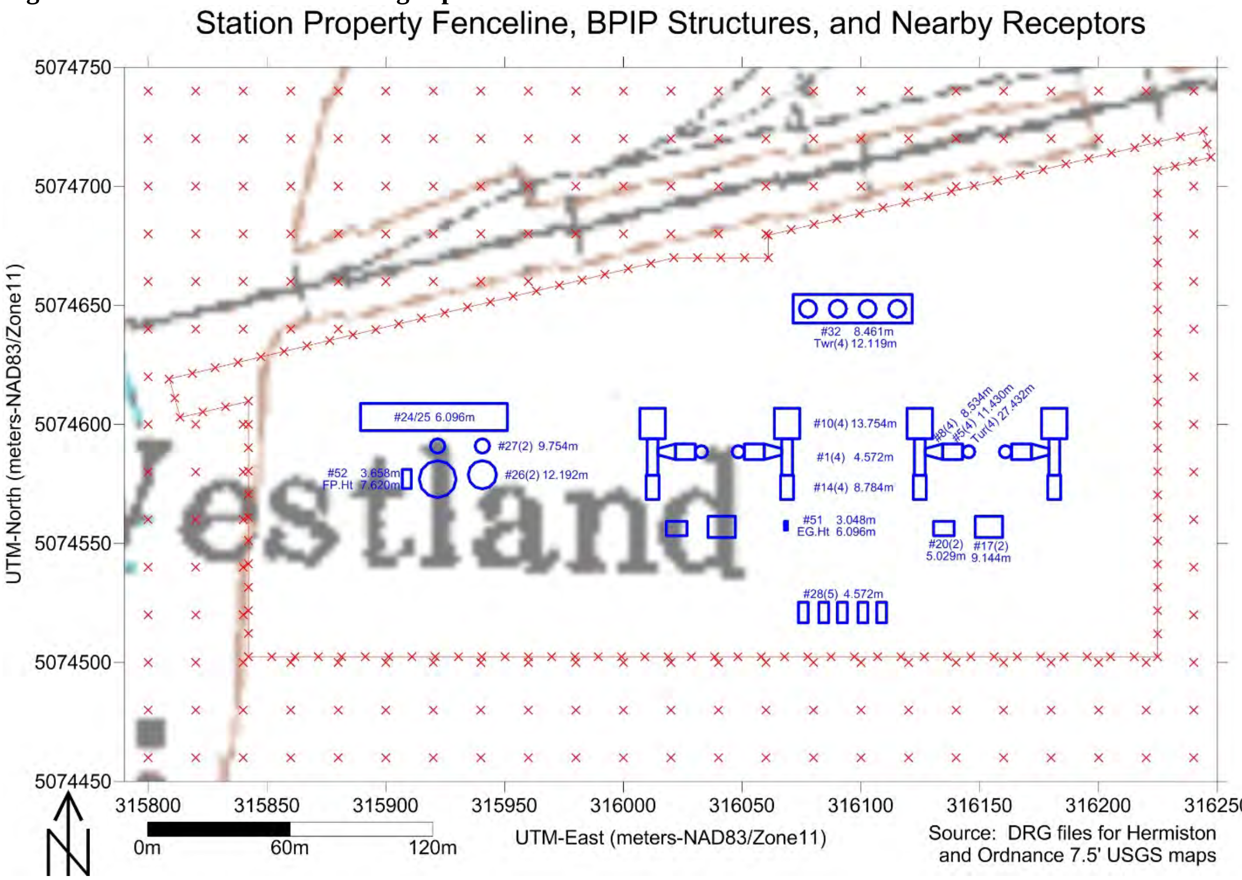
- Comparison of impacts to significant impact levels (SILs).
- Compliance with National Ambient Air Quality Standards (NAAQS).
- Compliance with PSD Increments

6.3 Good Engineering Practice Stack Height Analysis

Formula Good Engineering Practice (GEP) stack height was calculated as 34.38 meters due to the CTG intake air filters for most stacks. GEP stack height for the firepump was calculated as 30.48 meters due to the raw water tanks. The design stack heights for all modeled are less than these GEP stack heights, so downwash effects were included in the modeling analysis.

BPIP-PRIME was used to generate the wind-direction-specific building dimensions for input into AERMOD. Figure 6.3-1 shows the structures included in the BPIP-PRIME downwash analysis.

Figure 6.3-1 BPIP-PRIME Building Inputs



6.4 Receptor Grid Selection and Coverage

AERMAP (version 11103) was used to obtain the receptor elevations and hill slope factors for AERMOD. Receptor elevations were determined in AERMAP by using GIS Data Depot Digital Elevation Model (DEM) data files, with each DEM file covering an area equivalent to a 7.5' USGS map. DEM files with 10-meter node spacing were utilized for all receptor grids (20 meter through 500-meter spacing). AERMAP options were selected to interpolate the DEM data in North American Datum 1927 (NAD27) coordinates to North American Datum 1983 (NAD83) coordinates (in the modeling analyses, sources and receptors were referenced to UTM NAD83, Zone 11).

Cartesian coordinate receptor grids were created to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. The maximum extent of the significant impact isopleth for any pollutant was used to represent the impact radius for that pollutant and averaging period.

For the full impact analyses, a nested grid was developed to fully represent the significance area(s) and maximum impact locations, with spacing as needed in order to obtain the maximum modeled concentration. Figure 6.4-1 presents the receptors grids used in the dispersion modeling analyses of the Station and were based on the following assumptions:

- The fence line receptor grid based on 10 meter resolution.
- The downwash receptor grid with receptor spacing of 20-meters beyond the facility fence line out to 500 meters from the Station.
- An intermediate receptor grid with 100-meter receptor spacing from the downwash receptor grid out to 1000 meters from the Station.
- A coarse receptor grid with 200-meter receptor spacing from the intermediate receptor grid outwards at least 5 km from the Station in all directions.
- Additional receptors extending the coarse grid with 500-meter spaced receptors outwards at least 10 km from the Station in all directions.

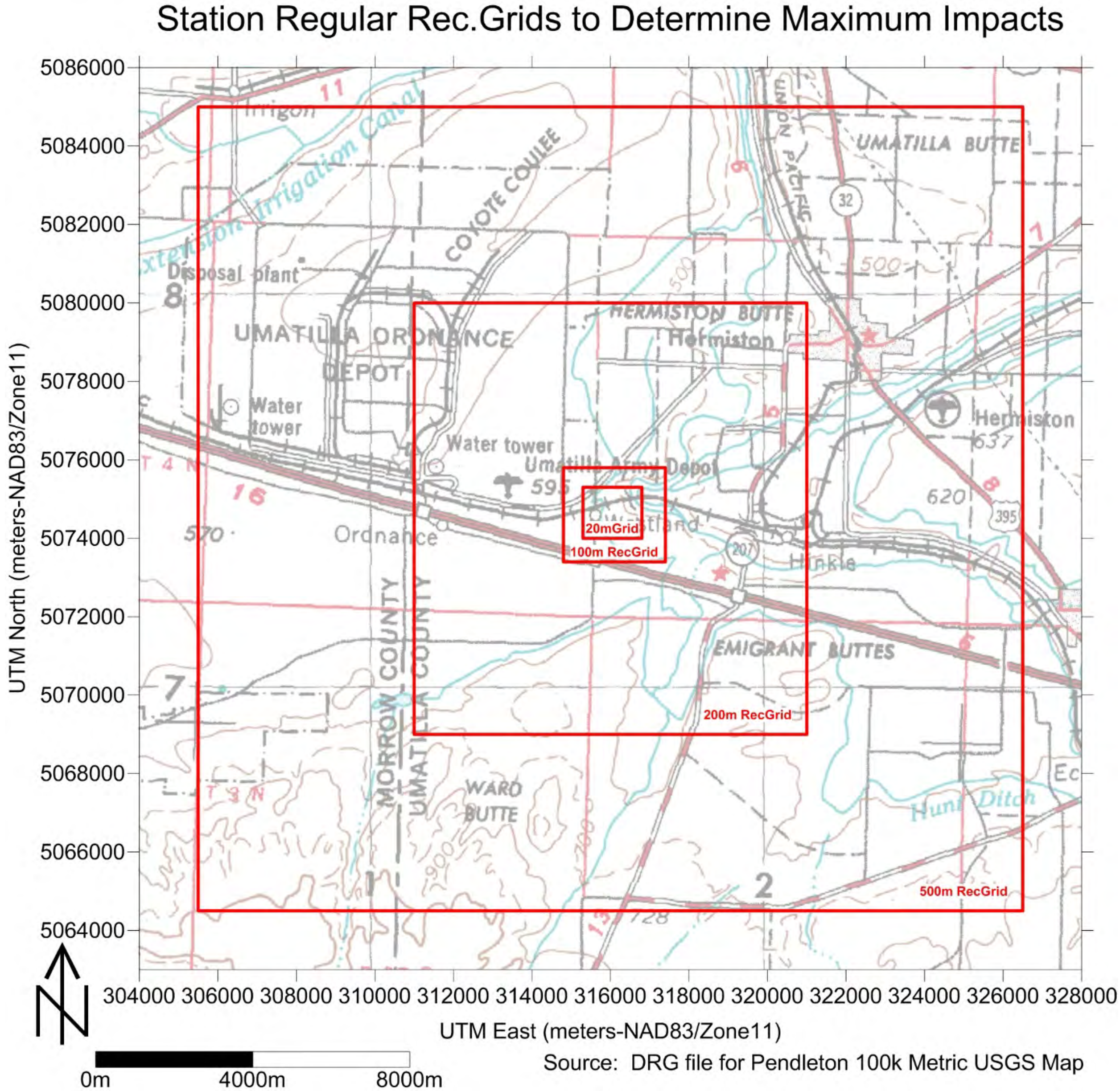
All maximum Station impacts occurred on the 10-meter property fence line receptor grid or in areas with 20-meter spaced receptors, so no additional refined receptor grids were necessary to determine maximum impacts. Ambient concentrations inside the property fence line were not assessed.

6.5 Meteorological Data Selection

Hourly observations of certain meteorological parameters are used to define the area's dispersion characteristics. These data are used in approved air dispersion models for defining a project's impact on air quality. These data must meet certain criteria established by the EPA and DEQ and the following discussion details the proposed data and its applicability to this project. This discussion was also presented in the dispersion modeling protocol for the Station and was approved for use by the DEQ on March 1st, 2013.

The nearest consecutive five (5) year representative surface data set in the general area of the proposed Station is at the nearby Umatilla Army Depot (Depot) for the years 1995 through 1999 and was provided to Atmospheric Dynamics by the DEQ. The Depot monitoring station is located approximately 4.5 kilometers northwest of the Station. For each of the years, the surface data recovery exceeds 90 percent which satisfies the PSD requirements for data recovery. The Depot site elevation and the proposed project elevation differ by approximately 30 meters and both lie within the Columbia River Valley. The surrounding terrain are identical at the two locations. Representative upper air data was obtained from Spokane International Airport for the same time period.

Figure 6.4-1 Station Receptors Grids



The area surrounding the project site, within three (3) km, can be characterized as rural, made up largely of shrub lands and pasture/hay, based on review of land use/land cover data as well as recent aerial photo data. In accordance with the Auer land use classification methodology (EPA's "*Guideline on Air Quality Models*"), land use within the area circumscribed by a three km radius around the facility is greater than 50 percent rural. Therefore, in the modeling analyses, no urban coefficients were assigned.

<u>Meteorological Data Representativeness</u>: The use of the five (5) years of supplied surface meteorological data collected at the Depot monitoring location satisfies the definition of on-site data. EPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates from the Clean Air Act in Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility." This requirement and EPA's guidance on the use of on-site monitoring data are also outlined in the On-Site Meteorological Program Guidance for Regulatory Modeling Applications (EPA, 1987). The representativeness of meteorological data is dependent upon: (a) the proximity of the meteorological monitoring site to the area under consideration; (b) the complexity of the topography of the area; (c) the exposure of the meteorological sensors; and (d) the period of time during which the data are collected.

First, the meteorological monitoring site and proposed project location are at approximately the same elevation and with similar topography surrounding each location. Second, the two sites are located roughly about the same distance and in the same orientation to the significant terrain features in the region that influence wind flow patterns. These terrain features are part of the same large scale terrain features in the area that are oriented in a southwest to northeast direction. There are no specific terrain features in the project area that would cause directional steering of locally generated winds or would influence the predominant meteorology in the project area. Third, the surface characteristics roughness length, Bowen ratio, and albedo are relatively consistent throughout the area and are nearly identical between the project site and the meteorological monitoring location.

Representativeness is defined in the document "Workshop on the Representativeness of Meteorological Observations" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as is the case with the meteorological monitoring site and the proposed project location. In determining the representativeness of the meteorological data set for use in the dispersion models at the project site, the consideration of the correlation of terrain features to prevailing meteorological conditions, as discussed earlier, would be nearly identical to both locations since the orientation and aspect of terrain at the proposed project location correlates well with the prevailing wind fields as measured by and contained in the meteorological dataset. In other words, the same mesoscale and localized geographic and topographic features that influence wind flow patterns at the meteorological monitoring site also influence the wind flow patterns at the proposed project site.

Surface characteristics were determined with AERSURFACE using Land Use/Land Cover (LULC) data in accordance with EPA guidance documents ("*AERMOD Implementation Guide,*" 1/09/08; and "*AERSURFACE User's Guide,*" EPA-454/B-08-001, 1/08) as described below. AERSURFACE uses U.S. Geological Survey (USGS) National Land Cover Data 1992 archives (NLCD92) to determine the midday albedo, daytime Bowen ratio, and surface roughness length representative of the surface meteorological station. ***Bowen ratio*** is based on a simple unweighted geometric mean while ***albedo*** is based on a simple unweighted arithmetic mean for the 10x10 km square area centered on the selected location (i.e., no direction or distance dependence for either parameter). ***Surface roughness length*** is based on an inverse distance-weighted geometric mean for upwind distances up to one (1) km from the selected location. The circular surface roughness length area (1-km radius) can be divided into any number of sectors as appropriate (EPA guidance recommends that no sector be less than 30º in width). There were no significant existing structures in the 1-km area around the location of the meteorological data tower during the years that the meteorological data were collected (1995-1999). Based on the predominant and relatively homogeneous land use around the Depot site, AERMET was executed using one 360-degree sector for roughness lengths obtained from AERSURFACE for the meteorological monitoring location.

Running AERSURFACE at both the meteorological monitoring site and the Station produced similar results for both Bowen ratio and Albedo, based on the 10 kilometer area around each location, as shown in Table 6.4-1. There were some variations in land cover and roughness lengths between the two locations based on a one kilometer radius, but both areas are mostly rural. Table 6.4-2 presents the calculated 1-kilometer radius AERSURFACE land use types around the Depot meteorological monitoring site and the Station. Based on the Auer land use classifications, both locations are classified as rural and there is good correlation of the rural characteristic land types between these two locations. These areas have low surface roughness lengths more closely comparable to rural categories than areas typically associated with commercial/industrial buildings and structures. Comparing the AERSURFACE data output at the Station to the Depot showed that the same general land use categories exist around both sites, with each having a majority associated with open, rural areas.

Table 6.4-1 AERSURFACE Parameters by Season

	Depot	Station
Surface Roughness (meters)		
Winter (Dec-Feb)	0.241	0.056
Spring (Mar-May)	0.242	0.068
Summer (June-Aug)	0.243	0.142
Fall (Sept-Nov)	0.243	0.142
Albedo		
Winter (Dec-Feb)	0.22	0.21
Spring (Mar-May)	0.21	0.19
Summer (June-Aug)	0.22	0.22
Fall (Sept-Nov)	0.22	0.22
Bowen Ratio		
Winter (Dec-Feb)	2.49	1.77
Spring (Mar-May)	1.28	0.88
Summer (June-Aug)	1.78	1.26
Fall (Sept-Nov)	2.49	1.77
AERSURFACE Inputs	**Latitude/Longitude**	**UTM Zone 11**
Latitude/UTM-X(m)	45.8459	316026.3
Longitude/UTM-Y(m)	-119.4175	5074829.6
Datum Source	NAD83	NAD83
Continuous Snow Cover	No	No
Arid Region	Yes	Yes
Airport Location	No	No

Table 6.4-1 AERSURFACE Parameters by Season		
	Depot	**Station**
Surface Moisture	Average	Average
Surface Roughness Radius (km)	1.0	1.0
Number of Sectors	**1 (0-360°)**	1 (0-360°)

Table 6.4-2 AERSURFACE Land Cover Counts: Surface Roughness (1 km)					
LULC Category		Depot		Station	
11	Open Water:	0	0.0%	93	2.7%
12	Perennial Ice/Snow:	0	0.0%	0	0.0%
21	Low Intensity Residential:	0	0.0%	87	2.5%
22	High Intensity Residential:	0	0.0%	0	0.0%
23	Commercial/Industrial/Trans:	983	28.2%	28	0.8%
31	Bare Rock/Sand/Clay:	0	0.0%	0	0.0%
32	Quarries/Strip Mines/Gravel:	0	0.0%	0	0.0%
33	Transitional:	0	0.0%	0	0.0%
41	Deciduous Forest:	0	0.0%	0	0.0%
42	Evergreen Forest:	0	0.0%	0	0.0%
43	Mixed Forest:	0	0.0%	0	0.0%
51	Shrubland:	2488	71.3%	1891	54.1%
61	Orchards/Vineyard/Other:	0	0.0%	0	0.0%
71	Grasslands/Herbaceous:	18	0.5%	24	0.7%
81	Pasture/Hay:	0	0.0%	1368	39.2%
82	Row Crops:	0	0.0%	0	0.0%
83	Small Grains:	0	0.0%	0	0.0%
84	Fallow:	0	0.0%	0	0.0%
85	Urban/Recreational Grasses:	0	0.0%	0	0.0%
91	Woody Wetlands:	0	0.0%	0	0.0%
92	Emergent Herbaceous Wetlands:	0	0.0%	0	0.0%
	Total:	3489	100.0%	3491	100.0%

For these reasons, the Umatilla Army Depot meteorological data was approved for use by the DEQ as it satisfied the definition of representative meteorological data.

6.6 Background Air Quality

In 1970, the United States Congress instructed the EPA to establish standards for air pollutants, which were of nationwide concern. This directive resulted from the concern of the impacts of air pollutants on the health and welfare of the public. The resulting Clean Air Act (CAA) set forth air quality standards to protect the health and welfare of the public. Two levels of standards were promulgated primary standards and secondary standards. Primary national ambient air quality standards (NAAQS) are “those which, in the judgment of the administrator [of the EPA], based on air quality criteria and allowing an adequate margin of safety, are requisite to protect the public health (state of general health of community or population).” The secondary NAAQS are “those which in the judgment of the administrator [of the EPA], based on air quality criteria, are requisite to protect the public welfare and ecosystems associated with the presence of air pollutants in the ambient air.” To date, NAAQS have been established for seven criteria pollutants as follows: SO_2, CO, ozone, NO_2, PM_{10}, $PM_{2.5}$, and lead.

The criteria pollutants are those that have been demonstrated historically to be widespread and have a potential to cause adverse health effects. EPA developed comprehensive documents detailing the basis of, or criteria for, the standards that limit the ambient concentrations of these pollutants. Review of the established air quality standards is undertaken by the EPA on a periodic basis. As a result of the periodic reviews, the standards have been updated and amended over the years following adoption.

Each federal NAAQS is comprised of two basic elements: (1) a numerical limit expressed as an allowable concentration, and (2) an averaging time which specifies the period over which the concentration value is to be measured. Table 6.6-1 presents the current federal NAAQS.

Table 6.6-1   Federal SILs and Ambient Air Quality Standards

Pollutant	Averaging Time	Class II SILs	National Standards Concentration
Ozone	8-hour	-	0.075 ppm (147 µg/m^3) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8-hour	500 µg/m^3	9 ppm (10,000 µg/m^3)
	1-hour	2000 µg/m^3	35 ppm (40,000 µg/m^3)
Nitrogen dioxide	Annual Average	1.0 µg/m^3	0.053 ppm (100 µg/m^3)
	1-hour	7.5 µg/m^3	0.100 ppm (188 µg/m^3)
Sulfur dioxide	Annual Average	1 µg/m^3	-
	24-hour	5 µg/m^3	-
	3-hour	25 µg/m^3	0.5 ppm (1,300 µg/m^3)
	1-hour	7.8 µg/m^3	0.075 ppm (196 µg/m^3)
Respirable particulate matter (10 micron)	24-hour	5 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	1 µg/m^3	-
Fine particulate matter (2.5 micron)	Annual Arithmetic Mean	0.3 µg/m^3	12.0 µg/m^3 (3-year average)
	24-hour	1.2 µg/m^3	35 µg/m^3 (3-year average of 98th percentiles)
Sulfates	24-hour	-	-
Lead	3 Month Rolling Average	-	0.15 µg/m^3

Source: CARB website, table updated 6/4/13
Notes: µg/m^3=micrograms per cubic meter
ppm=parts per million

Brief descriptions of health effects for the main criteria pollutants are as follows.

Ozone—Ozone is a reactive pollutant that is not emitted directly into the atmosphere, but rather is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving precursor organic compounds (POC) and NO_x. POC and NO_x are therefore known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of POC and NO_x under the influence of wind and sunlight. Short-term exposure to ozone can irritate the eyes and cause constriction of the airways. In addition to causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide—CO is a non-reactive pollutant that is a product of incomplete combustion. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic and are also influenced by meteorological factors such as wind speed and atmospheric mixing. Under inversion conditions, CO concentrations may be distributed more uniformly over an area out to some distance from vehicular sources. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease or anemia, as well as fetuses.

Particulate Matter (PM_{10} and $PM_{2.5}$)—PM_{10} consists of particulate matter that is 10 microns or less in diameter (a micron is 1 millionth of a meter), and fine particulate matter, $PM_{2.5}$, consists of particulate matter 2.5 microns or less in diameter. Both PM_{10} and $PM_{2.5}$ represent fractions of particulate matter, which can be inhaled into the air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, combustion, and atmospheric photochemical reactions. Some of these operations, such as demolition and construction activities, contribute to increases in local PM_{10} concentrations, while others, such as vehicular traffic, affect regional PM_{10} concentrations.

Several studies that the EPA relied on for its staff report have shown an association between exposure to particulate matter, both PM_{10} and $PM_{2.5}$, and respiratory ailments or cardiovascular disease. Other studies have related particulate matter to increases in asthma attacks. In general, these studies have shown that short-term and long-term exposure to particulate matter can cause acute and chronic health effects. $PM_{2.5}$, which can penetrate deep into the lungs, causes more serious respiratory ailments.

Nitrogen Dioxide and Sulfur Dioxide—NO_2 and SO_2 are two gaseous compounds within a larger group of compounds, NO_x and SO_x, respectively, which are products of the combustion of fuel. NO_x and SO_x emission sources can elevate local NO_2 and SO_2 concentrations, and both are regional precursor compounds to particulate matter. As described above, NO_x is also an ozone precursor compound and can affect regional visibility. (NO_2 is the "whiskey brown-colored" gas readily visible during periods of heavy air pollution.) Elevated concentrations of these compounds are associated with increased risk of acute and chronic respiratory disease.

SO_2 and NO_2 emissions can be oxidized in the atmosphere to eventually form sulfates and nitrates, which contribute to acid rain. Large power facilities with high emissions of these substances from the use of coal or oil are subject to emissions reductions under the Phase I Acid Rain Program of Title IV of the 1990 CAA Amendments. Power facilities, with individual equipment capacity of 25 MW or greater that use natural gas or other fuels with low sulfur content, are subject to the Phase II Program of Title IV. The Phase II program requires facilities to install Continuous Emission Monitoring Systems (CEMS) in accordance with 40 CFR Part 75 and report annual emissions of SO_x and NO_x. The acid rain program provisions will apply to the Project. The Project will participate in the Acid Rain allowance program through the purchase of SO_2 allowances. Sufficient quantities of SO_2 allowances are available for use on this Project.

Lead—Gasoline-powered automobile engines used to be the major source of airborne lead in urban areas. Excessive exposure to lead concentrations can result in gastrointestinal disturbances, anemia, and kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. The use of lead additives in motor vehicle fuel has been eliminated in United States and lead concentrations have declined substantially as a result.

The nearest criteria pollutant air quality monitoring sites to the proposed project site is the monitoring station located at Hermiston, which has collected hourly ozone (2009-2011), NO_2 (2007), $PM_{2.5}$ (2007) and CO (2008-2010) data. Ambient data has been collected at other sites within Oregon and are summarized in Table 6.6-2. Data from this site is proposed as representative of background PM_{10} and $PM_{2.5}$ in the HBP impact area(s).

Table 6.6-2 Background Concentration Data Summaries

Units	Avg Time	Site	2004	2005	2006	2007	2008	2009	2010	2011	Background Value Used In Analysis
OZONE											
ppm	8 Hr-4th Highest	Hermiston						.061	.063	.058	.063
ppm	3 yr Avg of 4th High	Hermiston						.063	.063	.060	
NO_2											
ppb	98th percentile of daily max	Hermiston				37					
ppb	Max 1 Hr Avg	Hermiston				47					
ppb	AAM	Hermiston				8					
ppb	98th percentile of daily max	Portland-Lafayette						40	33	33	40*
ppb	Max 1 Hr Avg	Portland-Lafayette						55	40	39	
ppb	AAM	Portland-Lafayette						10	9	9	10

Table 6.6-2 Background Concentration Data Summaries

Units	Avg Time	Site	2004	2005	2006	2007	2008	2009	2010	2011	Background Value Used In Analysis
SO_2											
ppb	1 Hr-99th percentile	Portland-Lafayette						9	8	9	9
ppb	3 Hr Avg Max	Portland-Lafayette						10	8	6	
ppb	3 Hr Avg of 2nd High	Portland-Lafayette						8	8	6	8
PM_{10}											
$\mu g/m^3$	24 Hr-Max	La Grande					29	53	37		
$\mu g/m^3$	24 Hr-2nd High	La Grande					29	34	32		
$\mu g/m^3$	24 Hr-Max	Pendleton				56	39	64			
$\mu g/m^3$	24 Hr-2nd High	Pendleton				49	38	40			49
$PM_{2.5}$											
$\mu g/m^3$	24 Hr-Max	Hermiston-AP				28					
$\mu g/m^3$	24 Hr-98th percentile	Hermiston-AP				3					
$\mu g/m^3$	AAM	Hermiston-AP				ND					
$\mu g/m^3$	24 Hr-Max	Hermiston-PS				32					
$\mu g/m^3$	24 Hr-98th percentile	Hermiston-PS				24					
$\mu g/m^3$	AAM	Hermiston-PS				ND					
$\mu g/m^3$	24 Hr-Max	Pendleton						23	20	26	
$\mu g/m^3$	24 Hr-98th percentile	Pendleton						22	18	26	26
$\mu g/m^3$	AAM	Pendleton						7.8	6.9	7.5	7.8
CO											
ppm	1 Hr-Max	Eugene-Lane Coll.					2.4	2.1	2.2		
ppm	1 Hr-2nd High	Eugene-Lane Coll.					2.2	2.1	1.9		2.2
ppm	8 Hr-Max	Eugene-Lane Coll.					1.7	1.6	1.5		
ppm	8 Hr-2nd High	Eugene-Lane Coll.					1.7	1.6	1.3		1.7

*Background value based on the most recent 3 years of data, if 3 years is available.

All data extracted from: 2011 Oregon Air Quality Data Summaries, DEQ-Air Division, DEQ-11-AQ-021, June 2012.

Notes:

1. For NO_2, the Portland-LaFayette data for 2009-2011 seems to "bound" the old Hermiston data from 2007/2008, so to be conservative the Portland data was used to characterize background.
2. For SO_2, very little data exists in the state, with no useable data for the eastern portion. As such, using the Portland-LaFayette data for SO_2 should result in a conservative estimation or background.
3. For PM_{10}, the Pendleton data was chosen as it is closer to the site and shows higher values than La Grande, although an average of the two sites may result in a more realistic estimate of background.
4. For PM2.5, the Pendleton data was used.

For CO, the Eugene-Lane College data was used as this data represents a rural site in close proximity to the Eugene urban area, therefore it should give a reasonable representation of the site background.

The project area is designated attainment/unclassified for all ambient air quality standards. For the statistical form of the hourly SO_2, NO_2 and 24-hour $PM_{2.5}$ concentrations, the 98th percentile background will be used for the modeling analyses. For background 24-hour PM_{10}, the high second high will be used.

Impacts on Class II Areas

6.7 Screening Analysis

Operational characteristics of the combustion turbine, such as emission rate, exit velocity, and exit temperature vary by operating load and ambient temperature. The Station will be operated over a variety of these temperature ranges and loads. Thus, the air quality analysis considered the range of operational characteristics over a variety of ambient temperatures and loads. The screening modeling analysis, using AERMOD and all five years of hourly meteorology (years 1995-1999), was performed for various typical load and duct firing conditions for five (5) ambient temperatures: 17°F (very cold day), 26°F, 53°F (annual average day), 79°F, (average hot day) and 97°F (maximum high temperature day). The combustion turbine operating condition that resulted in the highest modeled concentration in the screening analysis for each pollutant and for averaging periods of 24 hours or less were used in the refined impact analyses, which also included the firepump, emergency generator, and cooling tower stacks. The 53°F condition was assumed to represent annual average conditions. As such, no screening analyses were performed for annual average concentrations, which were modeled for the 53°F case at 100 percent load, which is the typical operating scenario.

The results of the load screening analysis are listed in Appendix C. The screening analysis shows that the worst-case load and ambient temperature condition for each pollutant and averaging period is:

- 1-Hour NO_2, CO and SO_2: Case A which is 100 percent load at 17°F
- 3-Hour SO_2 and 8-Hour CO: Case B which is 75 percent load at 17°F
- 24-Hour PM_{10}/$PM_{2.5}$: Case U which is 50 percent load at 97°F

6.8 Refined Analysis

Facility sources, including the four-cell cooling tower, were modeled in the analysis for comparisons with Significant Impact Levels (SILs) and National Ambient Air Quality Standards (NAAQS), as necessary. Based on discussions with DEQ, emergency equipment which are only operated intermittently (firepump and emergency generator) were not considered when modeling 1-hour NO_2 and 1-hour SO_2 impacts due to the statistical form of these standards. Since the firepump and emergency generator will not be tested at the same time, only the worst-case impact for either of these two sources (modeled with other facility equipment) was modeled for 1-hour CO impacts. In addition, since the firepump and emergency generator will not be tested during turbine start-ups, only the turbines were modeled for 1-hour CO impacts during start-up conditions.

For the combustion turbines, start-up and shutdown emissions were also accounted for in the refined analysis for all short-term (24-hours or less, with normal and start-up/shutdown scenarios modeled separately) and long-term (annual or 5-year averages, with start-up/shutdown emissions included in the annual emission rates) averages in the air quality modeling. The highest one-hour emissions during the start-up of the combustion turbine was used for determining one-hour NO_x and CO impacts for the start-up cases. For the eight-hour CO modeling for the start-up case, two startup and two shutdown emission rates were used to simulate the worst-case 8-hour period. Annual emission estimates already include emissions from start-up, shutdown, and any additional maintenance activities. Because the startup time for the combustion turbine will be one hour or less, the worst-case stack characteristics identified by the screening analysis (as discussed above) were modeled. Detailed emission calculations for all averaging periods are included in Appendix C.

The worst-case modeling input information for each pollutant and averaging period are shown in Table 6.8-1 for normal operating conditions and combustion turbine startup/shutdown conditions. Additionally, the stack parameters and emission rates for the cooling tower and emergency equipment is also included in the table. As discussed above, the combustion turbine stack parameters used in modeling the impacts for each pollutant and averaging period reflected the worst-case operating condition for that pollutant and averaging period identified in the load screening analysis. Stack parameters associated with operation at 100 percent load at an ambient temperature of 53°F were used in modeling annual average impacts.

Table 6.8-1 AERMOD Refined Modeling Analyses

Station Emission Rates and Stack Parameters

	Stack Height meters	Temp, deg K	Exhaust Velocity, m/s	Stack Diam, m	Emission Rates, g/s				
					NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$**
Averaging Period: One hour-Normal									
CTG #1	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	-
CTG #2	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	-
CTG #3	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	-
CTG #4	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	-
Emer Gen*	6.096	778.76	99.41	0.1524	n/a	0.4861	n/a	-	-
Fire Pump*	7.620	723.15	48.30	0.1524	n/a	0.2722	n/a	-	-
Averaging Period: One hour-One Startup									
CTG #1	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	-
CTG #2	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	-
CTG #3	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	-
CTG #4	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	-
Averaging Period: Three hours-Normal									
CTG #1	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-
CTG #2	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-
CTG #3	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-
CTG #4	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-
Emer Gen	6.096	778.76	99.41	0.1524	-	-	3.18E-4	-	-
Fire Pump	7.620	723.15	48.30	0.1524	-	-	1.63E-4	-	-
Averaging Period: Eight hours-Normal									
CTG #1	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-
CTG #2	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-
CTG #3	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-
CTG #4	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-
Emer Gen	6.096	778.76	99.41	0.1524	-	0.0608	-	-	-

Table 6.8-1 AERMOD Refined Modeling Analyses

Station Emission Rates and Stack Parameters

	Stack Height meters	Temp, deg K	Exhaust Velocity, m/s	Stack Diam, m	Emission Rates, g/s NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$**
Fire Pump	7.620	723.15	48.30	0.1524	-	0.0340	-	-	-
Averaging Period: Eight hours-Two Startups & Two Shutdowns									
CTG #1	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-
CTG #2	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-
CTG #3	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-
CTG #4	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-
Emer Gen	6.096	778.76	99.41	0.1524	-	0.0608	-	-	-
Fire Pump	7.620	723.15	48.30	0.1524	-	0.0340	-	-	-
Averaging Period: 24 hours-Normal									
CTG #1	27.432	712.98	14.52	5.1816	1.3936	-	-	0.7560	0.7699
CTG #2	27.432	712.98	14.52	5.1816	1.3936	-	-	0.7560	0.7699
CTG #3	27.432	712.98	14.52	5.1816	1.3936	-	-	0.7560	0.7699
CTG #4	27.432	712.98	14.52	5.1816	1.3936	-	-	0.7560	0.7699
Emer Gen	6.096	778.76	99.41	0.1524	0.0226	-	-	1.16E-3	1.39E-3
Fire Pump	7.620	723.15	48.30	0.1524	0.0126	-	-	6.48E-4	7.74E-4
Cooling Tower (each cell)	12.119	313.06	8.34	8.2296	-	-	-	0.0221	0.0221
Averaging Period: Annual=4400 hrs + 500 Startups + 500 Shutdowns									
CTG #1	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	0.4166
CTG #2	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	0.4166
CTG #3	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	0.4166
CTG #4	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	0.4166
Emer Gen (100 hours)	6.096	778.76	99.41	0.1524	6.18E-3	-	-	3.17E-4	3.79E-4
Fire Pump (100 hours)	7.620	723.15	48.30	0.1524	3.46E-3	-	-	1.78E-4	2.13E-4
Cooling Tower (each cell)	12.119	313.06	8.34	8.2296	-	-	-	0.0132	0.0132

Notes: The emergency generator and fire pump will not be tested during the same hour.
**$PM_{2.5}$ emissions include secondary aerosol emissions due to NO_x emissions.

6.9 Normal and Start-up Operations Impact Analysis

In order to determine the magnitude and location of the maximum impacts for each pollutant and averaging period, the AERMOD model was used with the worst-case stack parameters and emissions as described above. Table 6.9-1 summarizes proposed Station modeled concentrations for each criteria pollutant and associated averaging periods. The 1-hour and annual average concentrations of NO_2 were computed following the revised EPA Tier 2 guidance for computing these concentrations (*March 1, 2011 Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard*). The annual average was calculated using the ambient ratio method (ARM) with the national default value of 0.75 for the annual average NO_2/NO_x ratio. Short-term 1-hour NO_2 impacts used the ARM default value of 0.80 for the NO_2/NO_x ratio. No ozone limiting was used to assess NO_2 impacts.

In order to assess the Class II significance levels of the modeled concentrations, the following averaging periods were used:

- 1-hour NO_2 SIL was based on the 5-year average of the maximum 1-hour NO_2 concentrations modeled each year at each receptor;

- Annual NO_2 SIL was based on the maximum annual average concentration over the five (5) year period modeled for each receptor;
- 1-hour and 8-hour CO SILs were assessed based on the maximum modeled concentration at each receptor over the five (5) year period modeled for each receptor;
- 1-hour, 3-hour, and 24-hour SO_2 SILs were assessed based on the maximum modeled concentration at each receptor over the five (5) year period modeled for each receptor;
- Annual SO_2 SIL was based on the maximum annual average concentration over the five (5) year period modeled for each receptor;
- 24-hour $PM_{2.5}$ SIL was based on the 5-year average of the maximum 24-hour $PM_{2.5}$ concentrations modeled each year at each receptor;
- 24-hour PM_{10} SIL was based on the maximum 24-hour concentration over the five (5) years modeled for each receptor;
- Annual $PM_{2.5}$ SIL was based on the 5-year average of the annual average concentration modeled each year at each receptor; and
- Annual PM_{10} SIL was based on the maximum annual average concentration over the five (5) year period modeled for each receptor.

Based on the modeling results, the only pollutants which exceeded the applicable Class II SILs were the following:

- 1-hour NO_2
- 24-hour $PM_{2.5}$

Thus, in the preparation of the multisource PSD Increment and NAAQS analyses below, only these two pollutants and averaging periods were assessed.

The fire pump and emergency generator will be permitted for operation at 100 hours per year. Weekly testing of the equipment will be the most likely operating scenario for these sources. Following the EPA Guideline "*Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard, March 2011*", the emergency equipment was not included in this analysis due to the intermittent operation. Thus, the 1-hour NO_2 modeling was based on turbine operation, modeled separately for normal and start-up operations, which is consistent with the EPA Modeling Guidelines. The emergency equipment was included in the modeling analyses for CO and PM_{10}/$PM_{2.5}$ and for all annual average impacts. It should be also noted that the firepump and emergency generator will not be tested during the same hour, so only the worst-case impact (firepump + turbines vs. emergency generator + turbines) was reported for 1-hour CO impacts.

The maximum impact locations for normal facility operating conditions and start-up conditions occurred in the immediate vicinity of the facility either on the fenceline or within the downwash grid in the 20-meter-spaced receptor areas. Therefore, no additional 20-meter-spaced receptor grids in the coarse or intermediate receptor grid areas were required for these pollutants and averaging times.

Based on the modeling results of the Station, with the added monitored background included for a total proposed project impact as summarized in Table 6.9-1, the project will comply with the applicable NAAQS for all pollutants and averaging periods.

Table 6.9-1 Air Quality Impact Results for Refined Modeling Analysis of Project

Pollutant	Avg. Period	Maximum Concentration (µg/m³)	Background (µg/m³)	Total (µg/m³)	Class II Significance Level (µg/m³)	Ambient Air Quality Standard (µg/m³)
Normal Operating Conditions						
NO_2	Avg 1-hour Max	5.83	n/a[a]	n/a[a]	7.5	n/a
	Avg 1-hr 98th%	2.81	75.3	78.1	n/a	188
	Max Annual	0.135	18.8	18.9	1	100
CO	1-hour Max	129.4	2519	2648	2,000	40,000
	8-hour Max	9.93	1947	1957	500	10,000
SO_2	1-hour Max	2.72	23.6	26.3	7.8	196
	3-hour Max	1.95	20.9	22.9	25	1,300
	24-hr Max	0.679	n/a[a]	n/a[a]	5	-
	Annual Max	0.008	n/a[a]	n/a[a]	1	-
PM_{10}	24-hr Max	2.84	49	51.8	5	150
	Max Annual	0.125	n/a[a]	n/a[a]	1	-
$PM_{2.5}$	Avg 24-hr Max	2.34[b,c]	n/a[a]	n/a[a]	1.2	n/a
	Avg 24-hr 98th%	1.39[b]	26	27.4	n/a	35
	Avg Annual	0.101[b]	7.8	7.9	0.3	12.0
Start-up/Shutdown Periods						
NO_2	Avg 1-hour Max	24.97	n/a[a]	n/a[a]	7.5	n/a
	Avg 1-hr 98th%	12.07	75.3	87.4	n/a	188
CO	1-hour Max	100.0	2519	2619	2,000	40,000
	8-hour Max	26.7	1947	1974	500	10,000

[a] 5-year average of the annual maximum impacts evaluated for 1-hour NO_2 and 24-hour PM2.5 for comparison to the Class II Significance Level (so background and NAAQS not considered here, but evaluated separately with the 5-year average of the annual 98th percentile daily maximum impacts). Annual PM2.5 evaluated with the 5-year average of the annual impacts for the Class II Significance Level. Also, pollutants with increments that no longer have any corresponding NAAQS (24-hour and annual SO_2 and annual PM_{10}) were evaluated for comparison to the Significance Level.
[b] PM2.5 impacts include secondary aerosol impacts due to NO_x emissions at a 100:1 ratio (ODEQ March 1st email to ADI).
[c] Maximum 24-hour PM2.5 impact for any year modeled (not the 5-year average of the annual 24-hour maxima) is 2.89 µg/m³, for use in comparison to the Class II PSD increment.

EPA's PSD regulations also require an applicant to provide preconstruction monitoring data for purposes of use in the Source Impacts Analysis. However, a source is exempt from this requirement if its modeled impact in any area is less than pollutant-specific "significant monitoring concentrations" ("SMC"), which EPA has generally established as five times the lowest detectable concentration of a pollutant that could be measured by available instrumentation. Table 6.9-2 lists the SMCs for each applicable pollutant.

Table 6.9-2 Significant Monitoring Concentrations Thresholds

CO: 8-hr average	575 µg/m³
PM_{10}: 24-hr average	10 µg/m³
$PM_{2.5}$ 24-hr average*	4 µg/m³
NO_2: annual average	14 µg/m³
SO_2: 24-hr average	13 µg/m³

Note: The 24-hour PM2.5 SMC has been vacated.

Even if a source's potential impacts exceeds the corresponding SMC, and the applicant must therefore provide preconstruction monitoring data as part of its Source Impact Analysis, that does not necessarily mean the applicant must install and operate a new monitor at the project site. Rather, according to EPA guidance, an applicant may satisfy the preconstruction monitoring obligation in one of two ways: (i) Where existing ambient monitoring data is available from representative monitoring sites, the permitting agency may deem it acceptable for use in the Source Impacts Analysis; or (ii) where existing, representative data are not available, then the applicant must obtain site-specific data.

As a general matter, the permitting agency has substantial discretion "to allow representative data submissions (as opposed to conducting new monitoring) on a case-by-case basis." In determining whether existing data are representative, EPA guidance has emphasized consideration of three factors: monitor location, data quality and currentness of the data. The permitting agency also may approve use of data from a representative "regional" monitoring site for purposes of the NAAQS compliance demonstration.

The maximum offsite impact modeled to occur from the Station are below all applicable SMCs. Accordingly, the Station has proposed utilizing existing monitoring data from the surrounding region as a conservative estimate of background concentrations to satisfy the preconstruction monitoring requirement. Thus, no ambient air quality monitoring is proposed for this project.

6.10 Increment and NAAQS Impact Analyses

Under EPA's PSD regulations, an applicant must conduct a "source impact analysis", which demonstrates that "allowable emission increases from the source in conjunction with all other applicable emissions increases or reductions (including secondary emissions), would not cause or contribute to air pollution in violation of: (1) Any NAAQS in any region; or (2) Any applicable maximum allowable increase (increment) over the baseline concentration in any area."

If a source's modeled impact at any offsite location exceeds the relevant SIL, the source owner must then conduct a "multi-source" (or "cumulative") air quality analysis to determine whether or not the source's emissions will cause or contribute to a violation of the relevant NAAQS or applicable PSD increment. The PSD increment consumption analysis assures that, in those locations currently meeting the federal NAAQS (i.e., those deemed "attainment" or "unclassifiable"), the concentration of a given pollutant cannot increase by an amount greater than the "maximum allowable increase" specified by the Clean Air Act and/or the PSD regulations for the particular pollutant since the baseline date.

As shown in Table 6.9-1, project modeled impacts due to the Station's emissions are greater than the EPA-defined significance levels for 1-hour NO_2 (which were exceeded only during all four turbines in start-up mode) and for 24-hour $PM_{2.5}$ during normal operations. While EPA has promulgated a final SILs or PSD increments for $PM_{2.5}$, at this time, those standards have been vacated. However, in coordination with DEQ, those SILs and increments for $PM_{2.5}$ will be used for this permit application. Currently, there is no 1-hour NO_2 increment. A PSD Class II increment analysis will be performed for 24-hour $PM_{2.5}$. Also, a cumulative NAAQS source impacts from the project and other nearby sources were assessed for 24-hour $PM_{2.5}$ and 1-hour NO_2. The analysis demonstrates that the emissions from the Station will not cause or contribute to a violation of the NAAQS. The airshed in which the Station is located is considered to be in attainment or unclassified (which is presumed to be in attainment) with the NAAQS for $PM_{2.5}$ and NO_2.

6.11 Significant Impact Level Modeling Results for NAAQS and Increment

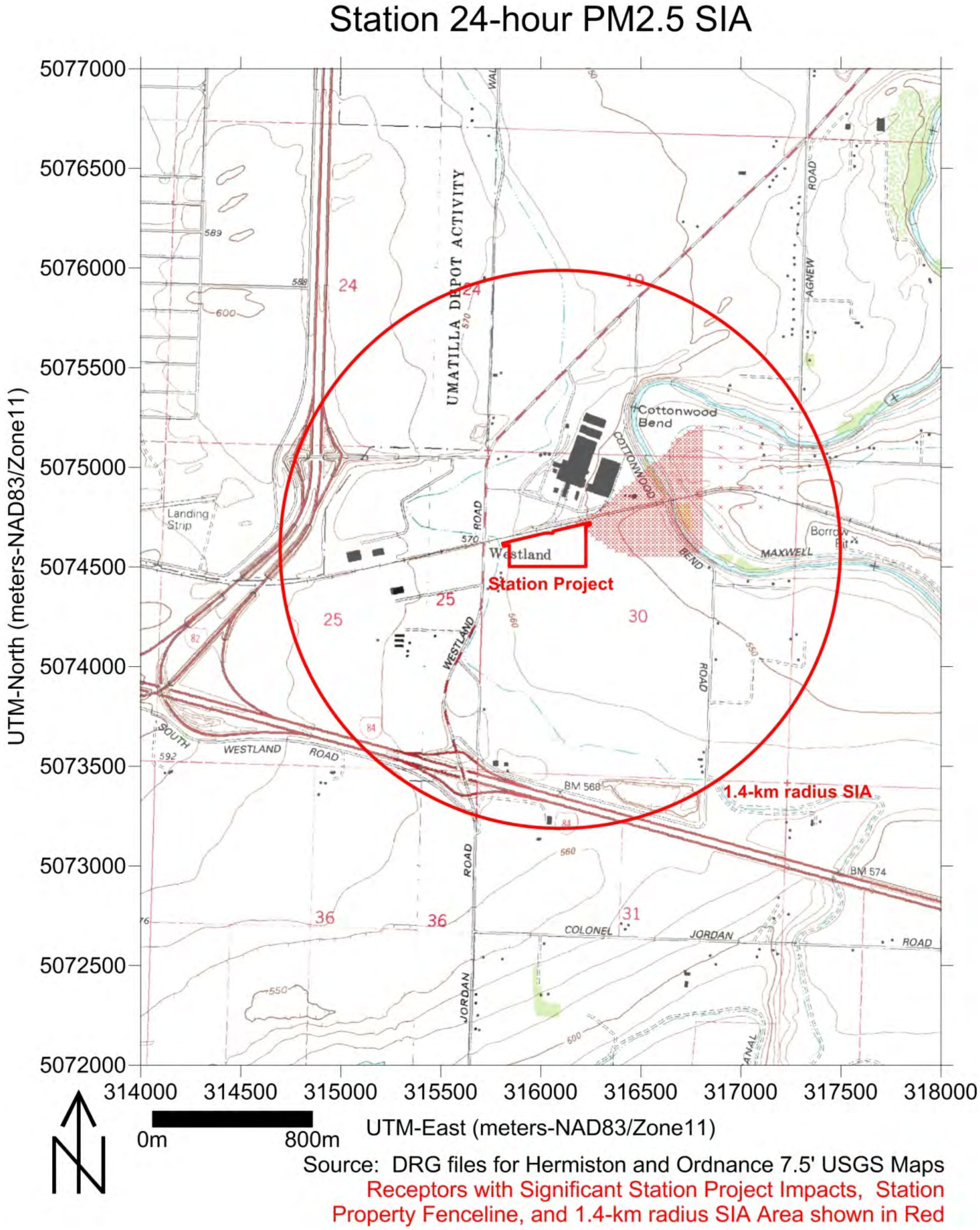
EPA guidance prescribes the use of the SILs to establish the "significant impact area" (SIA), which is used to identify the appropriate geographic area in which a multi-source NAAQS and increment impacts analysis should be conducted. The "impact area" is identified by drawing a circle around the site with a radius equal to the distance to the farthest location where an exceedance of the SIL is modeled to occur. The impact area is the geographical area for which the required air quality analyses for the NAAQS and PSD increments are carried out. This area includes all locations where the significant increase in the potential emission of a pollutant from a new source, or significant net emission increase from a modification, will cause a significant ambient impact (i.e., equal or exceed the applicable SIL). This impact area is then also used in a multi-source cumulative impacts analysis to "guide the identification of other sources to be included in the modeling analyses."

Emissions from the Station (project only without the inclusion of existing background sources at the Hermiston Generating Station) were modeled to determine the areal extent of the 24-hour $PM_{2.5}$ and 1-hour NO_2 significance areas for the NAAQS assessment. For $PM_{2.5}$, the maximum extent of receptors with modeled 24-hour $PM_{2.5}$ impacts greater than or equal to 1.2 $\mu g/m^3$ (based on the five-year average of maximum annual 24-hour impacts) is only 1.4 kilometers (km) radius from the project. The area of significant impacts extends to the northeast of the project site and is limited to the immediate project vicinity as shown in Figure 6.11-1. All receptors within the 1.4 km radius circular area were modeled in the 24-hour $PM_{2.5}$ multisource cumulative assessment.

For NO_2, the maximum extent of receptors with modeled 1-hour NO_2 impacts greater than or equal to 7.5 $\mu g/m^3$ (based on the five-year average of maximum annual 1-hour impacts) extended to the edge of the regular receptor grids used to determine maximum facility impacts. Therefore, the 500-meter spaced receptor grid was extended from its original extent of 10 km beyond the project fenceline to 15 km and an additional 1000-meter spaced receptor grid was added from the edge of the extended 500-meter spaced receptor grid to more than 50 km from the project fenceline in all directions. The extended 500-meter spaced SIA receptor grid was created by AERMAP (version 11103) with the 10-meter DEM data from GIS Data Depot (each file equal in area to a 7.5' USGS map as described earlier). The 1000-meter spaced SIA receptor grid was created by AERMAP with 90-meter DEM data from WebGIS equal to one-half of a 1:250,000 scale USGS map, covering 1 square degree of latitude and longitude. For these extended grids, the SIA was determined to be 52.4 km in radius from the project site. These extended receptor grids, as well as the receptors with significant impacts, are shown in Figure 6.11-2. All Station regular and SIA area receptors within the circular area with a 52.4 km radius were modeled in the 1-hour NO_2 multisource cumulative assessment.

Per EPA guidance, the larger impact area was then surveyed to identify other "nearby sources", which also should be included in the cumulative impacts analysis. Both Appendix W and the *Draft NSR Workshop Manual* require that the cumulative and increment impacts analysis to include “nearby sources”, which includes “[a]ll sources expected to cause a ***significant concentration gradient*** in the vicinity of the source or sources under consideration.” Appendix W further instructs that the “impact of nearby sources should be examined at locations where interactions between the plume of the point source under consideration and those of nearby sources (plus natural background) can occur”. Emphasizing that “[t]he number of sources is expected to be small except in unusual situations”.

Figure 6.11-1



Based on the radial distances of the $PM_{2.5}$ and NO_2 impact areas, plus an additional 50 km screening area which extended beyond the maximum SIL radius, the DEQ and Washington Department of Ecology (DOE) provided a source inventory to include in the multisource NAAQS and increment analyses. The inventory contained actual emissions to use in the increment analysis and potential emissions (PTE) to use in the NAAQS analysis. These sources are listed in Table 6.11-1 and are graphically displayed in Figure 6.11-3.

Figure 6.11-2

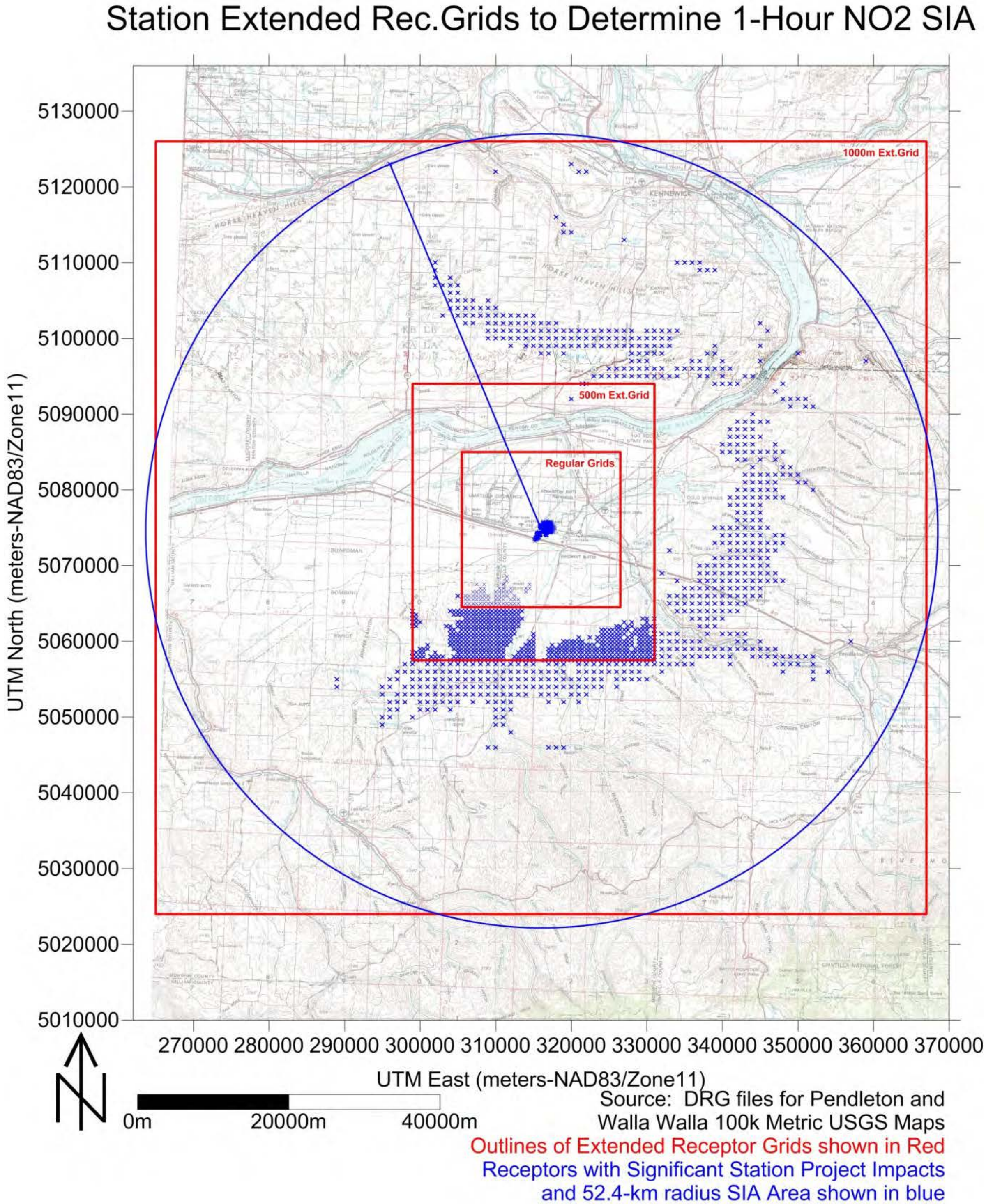


Table 6.11-1 Stack Parameters and Emission Rates for NAAQS and Increment Analyses										
Source ID	**Facility Name**	**UTM X (meters)**	**UTM Y (meters)**	**Base Elevation (meters)**	**Stack Height (meters)**	**Stack Temp (Kelvins)**	**Exhaust Velocity (m/s)**	**Stack Diam. (meters)**	**PTE NOx Emission Rates (g/s)**	**PTE PM2.5 Emission Rates (g/s)**
250002	Oregon Potato Co	291907	5080375	91.00	56.388	431.48	2.71	3.8710	1.2891	N/A
					6.096	Ambient	2.13	15.2400	N/A	0.2589
250016	Portland GE Co	281586	5063866	200.33	199.949	423.15	28.96	6.8580	335.7699	15.9945
250027	ConAgra	292345	5080238	91.00	18.288	422.04	11.28	2.4384	1.1219	0.2589
250031	Portland GE Co	292406	5080647	91.00	17.465	616.48	18.87	3.4747	8.2562	1.4628
250032	ConAgra	291710	5080292	91.00	18.288	431.48	2.71	3.8710	1.2945	0.6329
300062	JM Pipe Co	323828	5088169	124.60	6.096	Ambient	2.13	15.2400	N/A	0.2589
300075	ConAgra	316170	5074944	169.16	18.288	431.48	2.71	3.8710	2.3014	0.8918
300113	Hermiston Generating	315885	5074795	170.69	19.751	616.48	18.87	3.4747	7.8247	1.8725
300114	Hermiston Foods	324179	5076173	184.34	56.388	431.48	2.71	3.8710	1.1219	0.4027
300118	Hermiston Power LLC	320227	5073706	153.39	11.034	598.32	23.26	2.6213	9.0616	3.5392
309503	Pioneer Hi-Bred Int'l	323169	5076468	183.00	18.288	422.04	11.28	2.4384	1.1219	N/A
					6.096	Ambient	2.13	15.2400	N/A	0.1148
0050016	Northwest Pipeline (Williams)	313066	5089185	92.00	13.411	672.04	58.21	0.3048	27.9755	0.5510

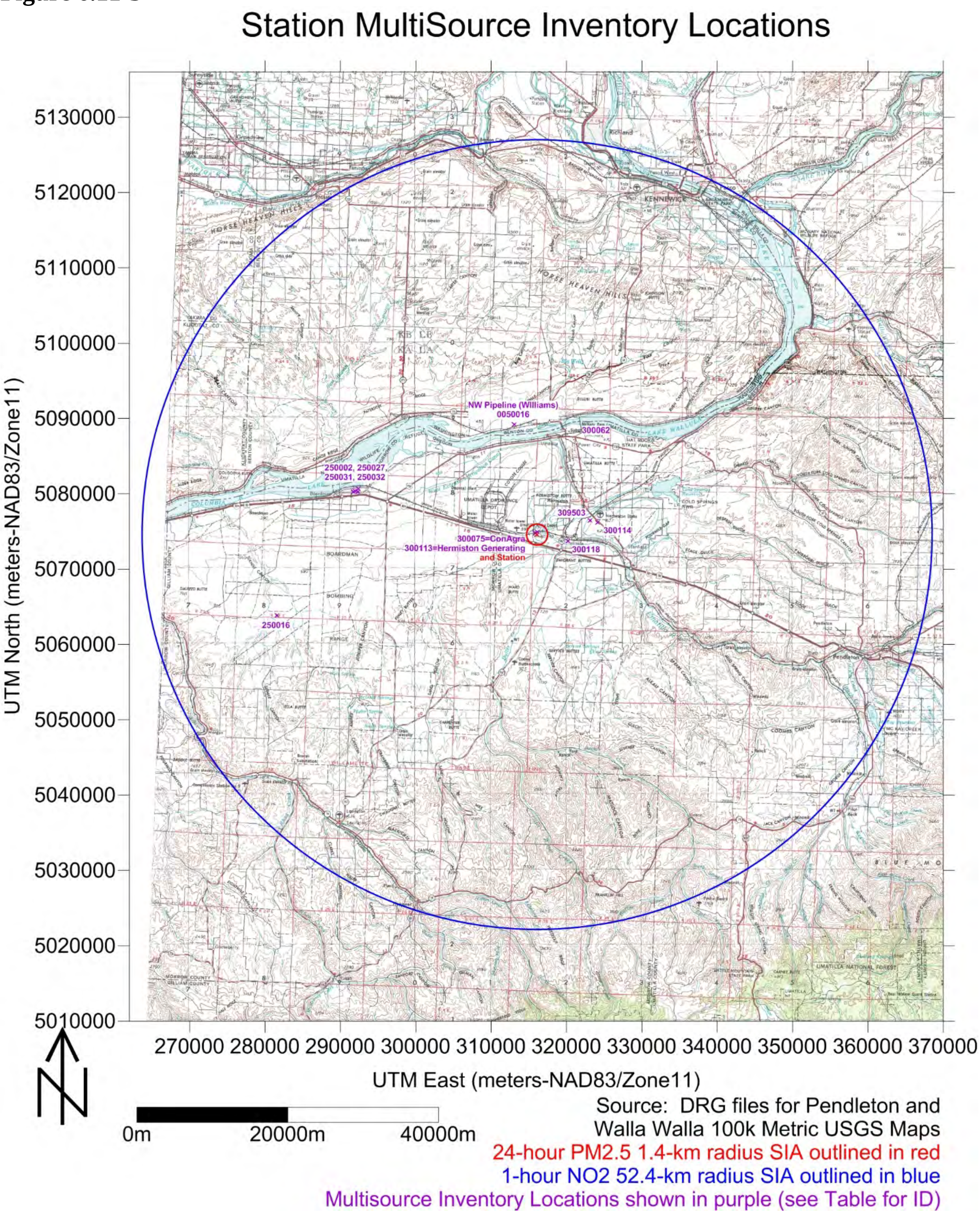
6.12 PSD $PM_{2.5}$ Increment Consumption Analysis

When EPA proposed increments for $PM_{2.5}$ in 2007, they proposed a number of options for establishing the "trigger date" for $PM_{2.5}$, but said that its preference was to follow the example it set upon promulgating NO_2 increments in 1988 and "reset" the trigger date (hence, the baseline for purposes of the increment consumption analysis) at the time of the rule's issuance. EPA stated that this approach would be more protective and also was justified under the Clean Air Act because $PM_{2.5}$ constitutes a "new pollutant", and not a revision of an existing criteria pollutant; as a consequence, EPA said the baseline date for purposes of $PM_{2.5}$ need not be tied to the historic baseline dates for either total suspended particulate or PM_{10}. This approach has been endorsed by many parties which commented on the proposed rule, including consortia of state and local permitting agencies. As the DEQ has full PSD delegation, they established a $PM_{2.5}$ baseline date of 2007. The proposed use of Class II SILs and increments for $PM_{2.5}$ are shown in Table 6.12-1.

Table 6.12-1 Proposed PSD Ambient Significance Levels and Increments*			
Pollutant/Avg. Period		Class II SIL (μg/m^3)	Class II Increment (μg/m^3)
PM2.5	- 24-hour	1.2	9
	- Annual	0.3	4

* Proposed PM2.5 SILs as the promulgated SILs have been vacated by EPA.

Figure 6.11-3



Station MultiSource Inventory Locations
UTM North (meters-NAD83/Zone11)
UTM East (meters-NAD83/Zone11)
5130000
5120000
5110000
5100000
5090000
5080000
5070000
5060000
5050000
5040000
5030000
5020000
5010000
270000 280000 290000 300000 310000 320000 330000 340000 350000 360000 370000
NW Pipeline (Williams)
0050016
300062
250002, 250027,
250031, 250032
309503
300114
300075=ConAgra
300113=Hermiston Generating
and Station
300118
250016
0m
20000m
40000m
Source: DRG files for Pendleton and
Walla Walla 100k Metric USGS Maps
24-hour PM2.5 1.4-km radius SIA outlined in red
1-hour NO2 52.4-km radius SIA outlined in blue
Multisource Inventory Locations shown in purple (see Table for ID)

Thus any major source that has been constructed or modified after the "trigger date" for $PM_{2.5}$ initiates both the minor and major source baseline date for increment. In light of this, the Station would not need to consider any other stationary sources for purposes of its increment consumption analysis as none of the sources listed in Table 6.11-1 have been constructed or modified (either through an increase or decrease of $PM_{2.5}$ emissions) after the 2007 baseline date. Thus, for 24-hour $PM_{2.5}$ increment consumption, the Station impact analysis alone, without background, is then compared to the increment.

As the Station is the first project to consume $PM_{2.5}$ increment in the basin (i.e., the first modified source since the major source baseline date). The five year maximum 24-hour $PM_{2.5}$ project-only impact is 2.89 $\mu g/m^3$ (which includes the secondary particulate formation based on a 100:1 ratio of potential NO_x emissions). This impact is a conservative assessment of the high second-high impacts normally used for PSD increment analyses. This impact is only 32% of the 24-hour PSD Class II $PM_{2.5}$ increment of 9 $\mu g/m^3$. Therefore, compliance with the PSD increment is demonstrated. At this time, there are no 1-hour NO_2 PSD increments. Hence, no further additional increment consumption analyses are included in this document.

6.13 Multisource Modeling for NAAQS

The general procedure utilized for the NAAQS multisource modeling is as follows:

- Establish the radial extent of the SIA based upon the modeled impacts for each pollutant standard. The distance from the source to the furthest impact that is equal to or above an applicable SIL establishes the radius of the area to evaluate.
- Obtain from the local air agencies, modeling and emission inventories of significant sources within the area to be evaluated.
- Include a screening area 50 km beyond the furthest distance of the SIA to include significant sources that could contribute to modeled background.
- Model all the sources together to determine the air quality impacts within the SIA.
- Add in a monitored background and if the sum is below the NAAQS standard, the project does not contribute to exceedances of the standard.
- If the sum is above the standard, perform a culpability analysis to determine if the new project's emissions contribute a significant impact (in both time and/or space) to the modeled exceedances

As noted previously there are two NAAQS standards being evaluated for this Project. The first is the 24-hour $PM_{2.5}$ and the second is the 1-hour NO_2 standard. Figure 6.11-1 illustrates the radial extent of the SIA for the 24-hour $PM_{2.5}$ which is 1.4 km. Figure 6.11-2 illustrates the radial extent of the SIA for the 1-hour NO_2 which is 52.4 km. Based on the 52.4 km distance from the Project, the DEQ and Washington State Department of Ecology (WDOE) provided the location of significant sources along with modeling and emission inventories within the area. Based on coordination with the DEQ, no additional sources existed in the extended area that would be considered to cause a significant concentration gradient. The DEQ and WDOE, which also included data provided by the Benton Clean Air Agency, provided a list of permitted emissions and/or stack characteristics for facilities to be included in the cumulative modeling analysis, which are summarized in Table 6.11-1. The complete data inventory provided by these agencies are listed in Appendix C.

For the NAAQS analysis, emissions from each identified facility were based on that facility's maximum "Potential-to-Emit". Emissions for each facility were summed for all stacks and then modeled for the facility stack with the greatest emissions for that pollutant. AERMAP, Google Earth, and/or USGS 7.5' USGS maps were used to determine the base elevation of each facility. The stack characteristics and emissions are shown on Table 6.11-1. The $PM_{2.5}$ multisource modeling analyses also included emissions from secondary aerosol formation for facilities with NO_x emissions greater than 100 tons/year based on 100:1 guidance ratio provided by the DEQ.

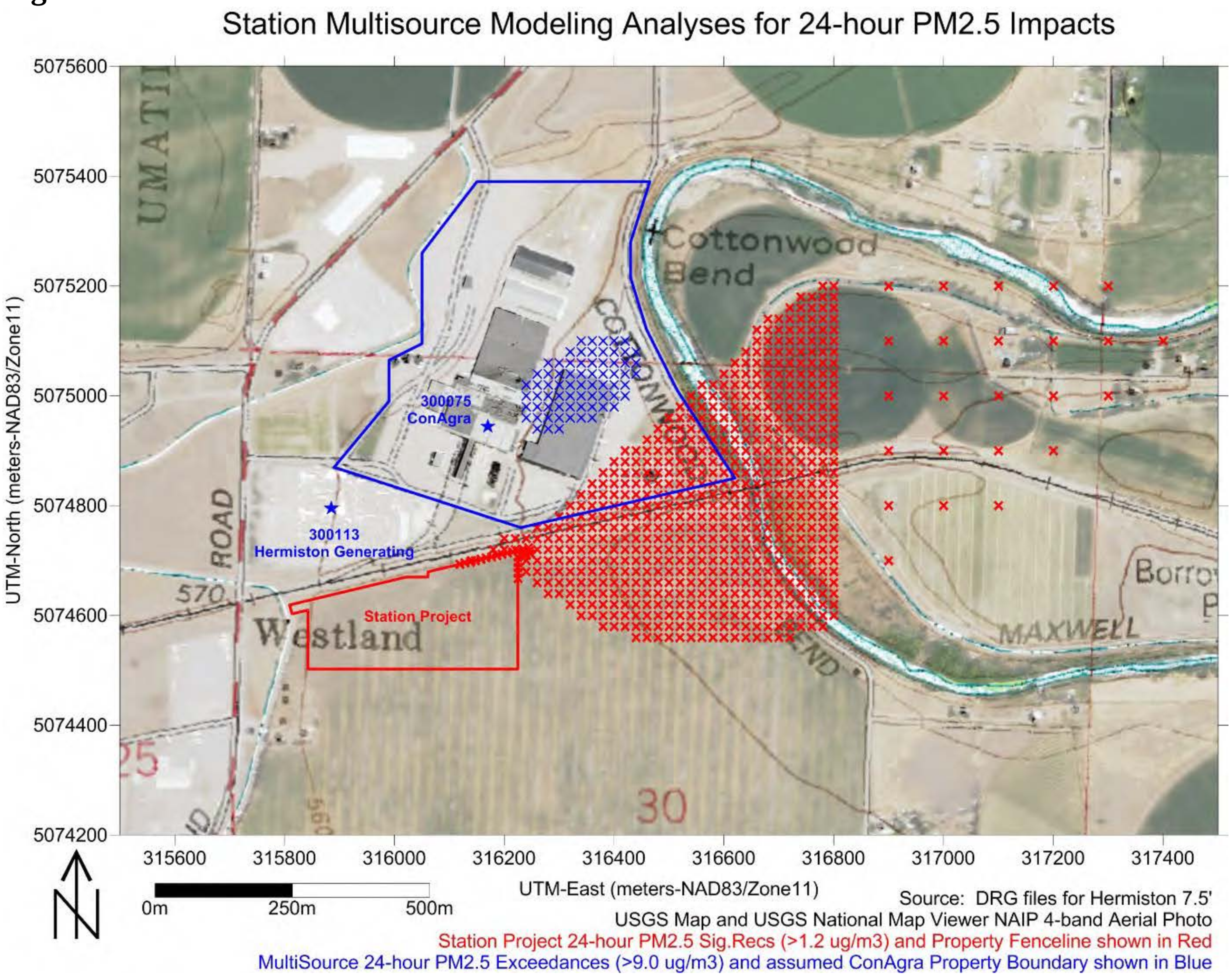
6.14 24-Hour $PM_{2.5}$ Standard

All the sources within the 1.4 km SIA and including sources extending out 50 km, along with the Project were modeled for the 24-hour $PM_{2.5}$ NAAQS. AERMOD was run for all receptors inside the circular 24-hour SIA with a radius of 1.40 km. Receptors beyond the SIA were not included as the Station's modeled impacts at these locations were always less than the applicable SIL. In addition, receptors within the SIA are also excluded, if the Station's modeled impact is below the SIL. Re-running the multisource modeling analysis to exclude these receptors results in a maximum 5-year average of the 98th percentile concentration of 7.86 µg/m^3. Adding the background concentration of 26 µg/m^3 results in a total concentration of 33.9 µg/m^3 which then shows compliance with the NAAQS of 35 µg/m^3.

The exclusion of receptors however within the SIA always requires evaluation and review to confirm their proper exclusion. Including all receptors within the SIA, the 5-year average of the annual 98th percentile 24-hour concentrations generates a maximum of 19.28 µg/m^3 that, when added to the background monitored concentration, will exceed the NAAQS. Analyzing the locations of these modeled higher concentrations show that these impacts were due to the nearby ConAgra facility emissions (#300075) at receptors that were immediately adjacent to the Project but are located within the ConAgra property boundary. (Note that these modeled impacts may be due to the simplified screening methodology of combining six emission sources at ConAgra into one source for this analysis.)These exceedance receptors that are caused primarily by ConAgra are shown in blue in Figure 6.14-1 along with the receptors with that were above the SIL based on emissions from the Station shown in red. As can be seen, the receptors that equal or exceed the 24-hour $PM_{2.5}$ SIL, due solely to the Station emissions of $PM_{2.5}$, do not overlap with the modeled ConAgra higher concentrations on their property. The maximum Station impact (5-year average of the maximum 24-hour impacts) at the ConAgra receptors shown in blue in Figure 6.14.1 (inside ConAgra property) was 0.875 µg/m^3, which is less than the 24-hour SIL of 1.2 µg/m^3.

Justification to exclude receptors below the SIL comes from EPA guidance that a "source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of each predicted violation." *Draft NSR Workshop Manual*, Draft October 1990, page C.52. Accordingly, even if violations of the NAAQS were modeled at other receptor locations, the Station could not be found to cause or contribute to any such violation because its maximum modeled concentration at that receptor location would be below the SIL. Additionally, the area within the expected ConAgra property boundary is not considered the true definition of ambient air for impacts based on the Station modeling analyses (similar to the area within the Station's fence line). Thus there are two major reasons for removing the receptors inside the ConAgra property boundary (estimated as shown on Figure 6.14-1).

Figure 6.14-1



6.15 1-Hour NO_2 Standard

All the sources within the 52.4 km SIA along with the Project were modeled for the 1-hour NO_2 NAAQS. No sources extending out 50 km were identified by the agencies to be included in the modeling analysis. AERMOD was run for all receptors inside the circular 1-hour SIA with a radius of 52.4 km. During the non-startup hours, the Station's 1-hour NO_2 impacts are less than the applicable 1-hour SIL. During startup events, the Station's 1-hour NO_2 impacts can exceed the SIL. Note that it is estimated that there may be up to 500 startup events per year. As with $PM_{2.5}$, any receptors beyond the SIA were not included in the NO_2 NAAQS analysis as these locations would always be less than the 1-hour SIL.

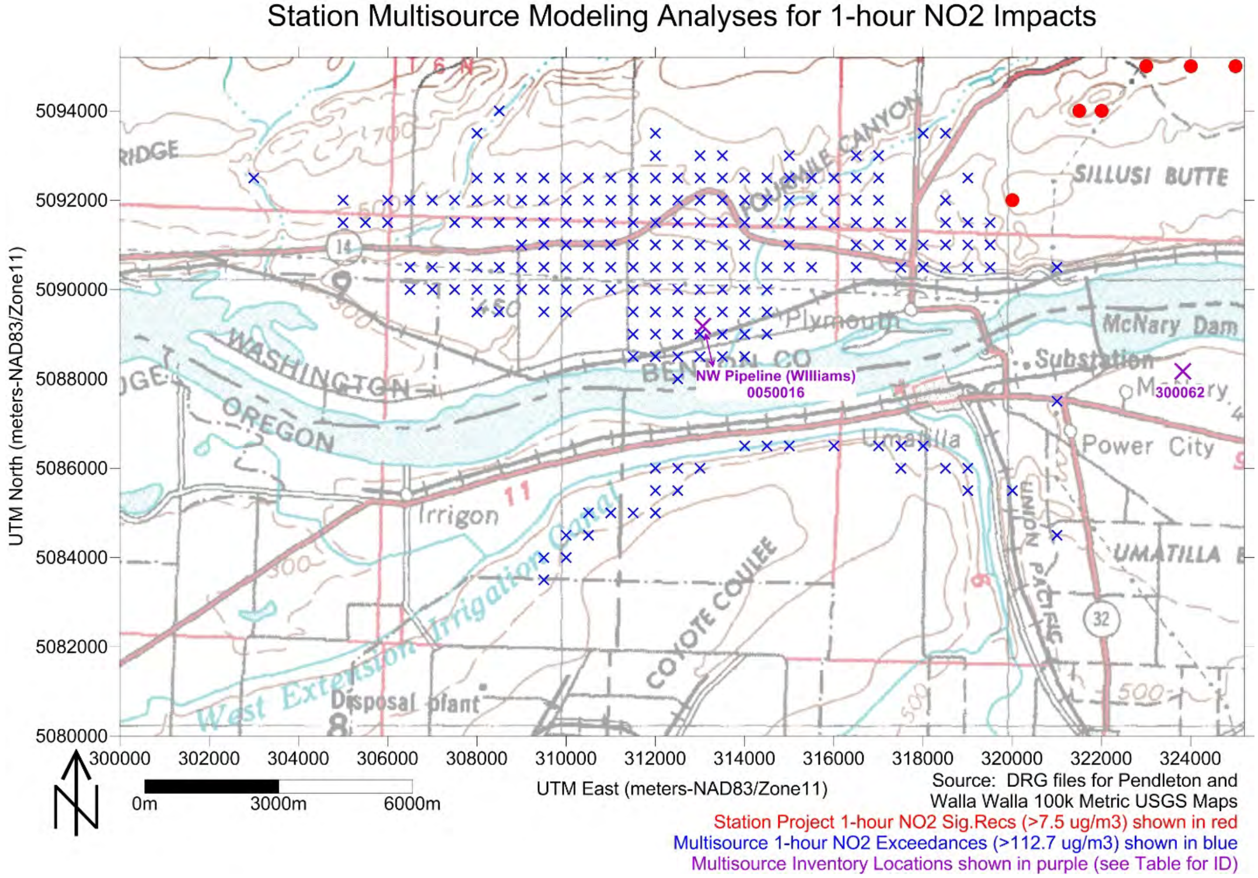
In addition, the receptors within the SIA conservatively includes receptors where the Station's modeled impacts (i.e., the 5-year average of the maximum annual predicted 1-hour concentrations) either exceeds or equals the 1-hour SIL of 7.5 μg/m^3 (i.e., see the actual number of significant receptor locations inside the circular SIA's in Figure 6.11-2). Re-running the multisource modeling analysis to exclude all receptors inside the SIA with the project impacts less than the SIL results in a maximum 5-year average of the 98th percentile multisource concentration of 46.4 μg/m^3. Adding the background concentration of 75.3 μg/m^3 results in a total concentration of 121.7 μg/m^3 which then shows compliance with the NAAQS of 188 μg/m^3.

The exclusion of receptors however within the SIA always requires evaluation and review to confirm their proper exclusion. Including all receptors within the SIA, the 5-year average of the annual 98th percentile 1-hour concentrations generated two areas requiring further attention. The first area generated a maximum daily 1-hour concentration of 489 μg/m^3. A closer examination of the predicted higher values shows that these impacts are due to the Northwest Pipeline (Williams) compressor station (#0050016) in Washington State for all the receptors north of ConAgra as shown in Figure 6.14-2. Not readily apparent in this figure, the receptors with significant Station impacts do not overlap with the modeled high values due to the Williams Facility. (Note that these modeled impacts may be due to the simplified screening methodology of combining the multiple emission sources at Williams into one source for this analysis.) Rerunning the maximum Station's impact (5-year average of the maximum annual 1-hour impacts) on these receptors with modeled high values (due primarily to Williams emissions based on the 5-year average of the annual 98th percentile daily 1-hour maximum concentrations) was 3.81 μg/m^3, which is much less than the SIL of 7.5 μg/m^3.

The second area of interest was the nearby ConAgra facility emissions (#300075) for a single receptor inside the ConAgra property boundary. This modeled impact was due primarily to the modeled worst-case stack used to represent NO_2 emissions from this facility. The Station was significant at this receptor for only one period (based on the 5-year average of the annual 1-hour maximum Station impacts). Rerunning the modeled multisource impact for this period produces 10.8 μg/m^3, or with background a total of 86.1 μg/m^3. As this is less than the NAAQS of 188 μg/m^3, the Station's emissions would not cause or contribute to any modeled NO_2 exceedances inside ConAgra property.

Justification to exclude receptors below the SIL comes from EPA guidance that a "source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of each predicted violation." *Draft NSR Workshop Manual*, Draft October 1990, page C.52. Thus the maximum multisource impact (5-year average of the annual 98th percentile daily 1-hour maximum concentrations) on receptors with significant Station impacts (5-year average of the maximum annual 1-hour impacts) outside the ConAgra property boundary was 46.4 μg/m^3, or a total concentration of 121.7 μg/m^3 after adding in the background concentration, which is less than the NAAQS of 188 μg/m^3. These results are conservative, in that the modeled multisource and Station impacts were considered for any time period at the modeled receptors (other than the single NO_2 exceedance receptor inside ConAgra property).

Figure 6.15-1



<u>6.16 Class I Impact Assessment</u>

According to EPA's *Draft NSR Workshop Manual*, an impact analysis must be performed for any PSD source which "may affect" a Class I area *Draft NSR Workshop Manual*, E.16. This includes any PSD source located within 100 km of a Class I area. However, Class I areas typically within 300 km are included in this type of analysis.

The Station is a major source for criteria pollutant emissions and is therefore automatically subject to PSD permitting requirements. The nearest Class I area is the Eagle Cap Wilderness Area, located approximately 130 km to the southeast (see Figure 6.16-1). Six (6) additional Class I areas are within 300 km of the Station. In addition, the Columbia River Scenic Gorge area is located approximately 121 kilometers west of the project. Table 6.16-1 lists the minimum and maximum distances from the Station to each Class I area.

Following the most recent FLAG Workshop procedures (June 2010), the use of the Screening Procedure (Q/D) to determine if the project could screen out of a formal AQRV assessment for visibility and nitrogen deposition was made. Following the screening procedures in FLAG, the emissions of NO_x, SO_x, $PM_{10}/PM_{2.5}$, and H_2SO_4 were summed after adjusting the emissions to reflect 8,760 hours of operation. The screening analysis is summarized below:

- Q = sum(NO_x+PM10/2.5+SOx+H_2SO_4) = 290

If Q/D is less than 10, then no AQRV analysis is required. Based on the ratio of Q/D, none of the Class I areas have a Q/D of greater than 10, as summarized in Table 6.16-1. Therefore, in coordination with the FLMs and DEQ, no AQRV analyses are required. Based on additional FLM Guidance, no regional haze analysis is required for the Columbia River Gorge National Scenic Area. The screening assessment does not apply to Class I increment or NAAQS, which are based solely on the Class I SILs. Therefore, Class I significance modeling for increment and NAAQS was performed in order to determine if the Class I SILs would be exceeded for all the major source pollutants.

Table 6.16-1   Class I Distance and Q/D Screening Analyses

Class I and Scenic Areas	***Minimum Distance (km)***	***Maximum Distance (km)***	***Q/D***
Strawberry Mt Wilderness Area	164.4	182.8	1.76
Eagle Cap WA	133.9	198.8	2.17
Goat Rocks WA	168.3	193.8	1.72
Mt Rainier NP	193.7	235.6	1.49
Mt Adams WA	167.6	180.7	1.73
Mt Jefferson WA	225.5	251.4	1.29
Mt Hood WA	178.89	205.6	1.62
Columbia River Gorge National Scenic Area	121.0	250.0	2.40

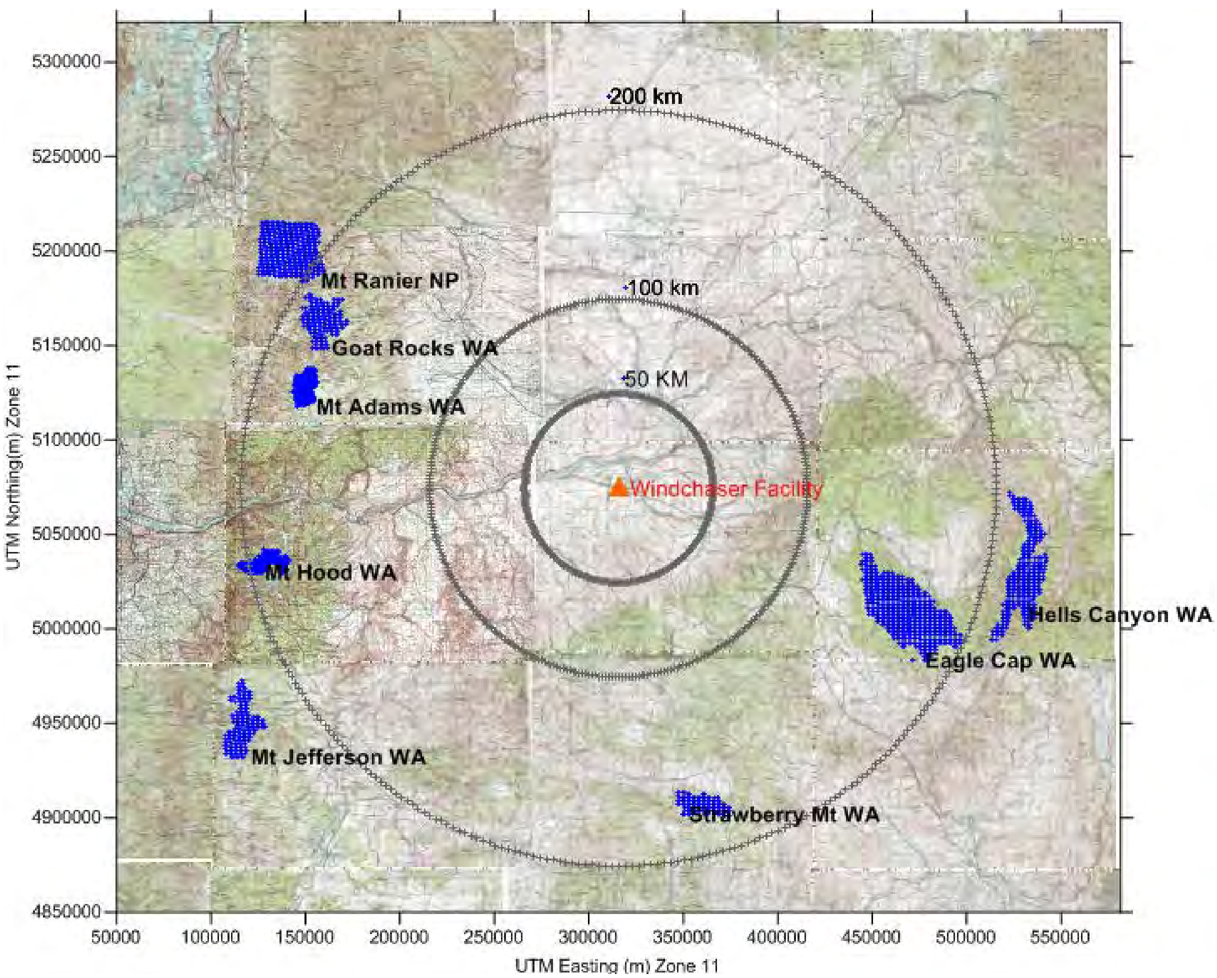
The EPA Modeling Guidelines suggest that the use of AERMOD be limited to distances of approximately 50 kilometers. Beyond 50 kilometers, the CALPUFF dispersion model is typically used to assess the long-range transport of pollutants. The approved Dispersion Modeling Protocol for the Station proposed the CALMET and CALPUFF models for the assessment of the Class I area listed in Table 6.16-1. However, since the requirement to assess AQRVs for each of these areas was not required, an alternative modeling approach with AERMOD was proposed to the DEQ for assessing Class I SILs. The approved approach would utilize a ring of receptors at 50 km distance from the Station, with receptors placed at two (2) degree intervals over the entire 360 degree circle of receptors. For each of these receptors, the receptor heights would be based on the lowest elevation to the maximum elevation for all seven (7) of the Class I areas, at 100 meter intervals. Using this modeling grid, the Class I SILs were assessed with the maximum listed in Table 6.16-2. These are the maximum 24-hour or annual impacts over the 5-years modeled. The results of the Class I SIL analysis demonstrates that all modeled impacts will be less than the applicable Class I SIL. Thus, no Class I increment or NAAQS analysis is required at any of the Class I areas.

TABLE 6.16-2 Criteria Pollutant Class I SILs and Increments

Pollutant	Averaging Interval	Maximum Modeled Impact on Receptor Ring (50 km) ($\mu g/m^3$)	Class I Significant Impact Level ($\mu g/m^3$)	Class I PSD Increment ($\mu g/m^3$)
NO_2	Annual	0.0030	0.1	2.5
PM_{10}	24-Hour	0.0301	0.3	25
	Annual	0.0021	0.2	5
$PM_{2.5}$	24-Hour	0.0307	0.07	2
	Annual	0.0022	0.06	1

Note: The $PM_{2.5}$ modeling included secondary emissions from NO_X at a 100:1 ratio

Figure 6.16-1 Station Project Location with respect to Class I Areas



6.17 Effects on Soils, Vegetation, and Sensitive Species

Impacts on soils, vegetation, and sensitive species were determined to be "insignificant" for the following reasons:

- No soils were identified in the Project area, which are recognized to have any known sensitivity to the types or amounts of air pollutants emitted by the proposed facility.
- No vegetation species were identified in the project area, which are recognized to have any known sensitivity to the types or amounts of air pollutants emitted by the proposed facility.
- The facility emissions are expected to be in compliance with all applicable air quality rules and regulations.
- The facility impacts are either less than significance or demonstrate that there are no violations of existing air quality standards. Nor will the Station cause an exacerbation of an existing violation of any quality standard.
- No animal species were identified in the Station area, which are recognized to have any known sensitivity to the types or amounts of air pollutants emitted by the proposed facility.

The AERMOD modeling results were compared against the thresholds in "A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals" (EPA-450/2-81-078, Table 3). The results of this analysis are listed below in Table 6.17-1. These results clearly indicate that no potential for impacts to local soils or vegetation are expected to occur.

Table 6.17-1 Soils and Vegetation Screening Results

Pollutant	Screening Level Concentration (μg/m^3)	Modeled Maximum from the Station (μg/m^3)	Model Averaging Time Used
SO_2 1-Hour	917	2.72	1 hour
SO_2 3-Hour	786	1.95	3 hour
SO_2 Annual	18	0.08	Annual
NO_2 4-Hours	3,760	< 24.97	1 hour
NO_2 1-Month	564	< 24.97	1 hour
NO_2 Annual	94	0.135	Annual
CO Weekly	1,800,000	< 9.93	8 hour

6.18 Plume Blight Analysis

A plume blight analysis was conducted for a screening assessment of the Columbia River Gorge National Scenic Area. The VISCREEN model (version 1.01) was used to conduct the plume blight analysis with a background visual range of 100 kilometers, based on data provided by the NPS IMPROVE data collected in the region. The VISCREEN model is typically limited to 50 kilometers or less for the calculation of a coherent plume visibility assessment. The Scenic Area is 121 kilometers from the Station. Thus, to conservatively calculate the potential for impacts, the maximum distance to the Scenic Area was placed at 50 kilometers.

A Level-2 visual plume impact was assessed with VISCREEN as recommended by the 1988 EPA Visibility Workbook (Revised 1992). The objective of a Level-2 screening analysis is identical to that of Level-1 except that the transport time and topography representative of the source area and study area are used instead. Since complex terrain separates the project site and the Scenic Area, the use of E stability is allowed based upon Workbook guidance. Furthermore, a wind speed of 1.5 m/s was used to represent transport time to the Scenic Area.

Emissions input into the model are assumed to create an infinitely long, straight plume traveling toward the specified area. The model outputs the change in light extinction in terms of Delta E and Contrast against both a terrain and sky background.

Results of the Level-2 analysis demonstrated that for the 10 degree forward scatter with terrain or sky as background Delta-E and Contrast would not exceed the screening level of 2.0 and 0.05 for the Scenic Area. Delta-E and C would also not exceed their respective screening levels for 140 degree backward scatter with sky background. Delta-E and C screening criteria would not be exceeded for 140 degree backward scatter with terrain background.

Table 6.18-1 contains the results of the Level 2 VISCREEN analysis. The Columbia River Gorge National Scenic Area is considered a scenic vista with visibility standards equal to that of a Class I airshed. However, based on guidance from the USFS and DEQ, a formal visibility analysis was not required for the Scenic Area. But in order to conservatively assess the potential for impacts, a worst-case analysis was performed with distances between the source and the Scenic Area reduced in order to perform this screening analysis. Given the actual distances involved, the results of the analysis would demonstrate even smaller impacts than those provided in the table below.

Table 6.18-1 Level 2 VISCREEN Analysis Results

Class II Area	Nearest Boarder	Furthest Boarder	Delta E				Contrast			
			Sky 10	Sky 140	Terrain 10	Terrain 140	Sky 10	Sky 140	Terrain 10	Terrain 140
Class II Visibility Analysis (inside Class II Area)	50 Km	100 Km	0.391	0.109	0.496	0.055	0.005	-0.04	0.005	0.002
Criteria[1]			2.00	2.00	2.00	2.00	0.05	0.05	0.05	0.05

Note: Criteria for Delta E and Contrast are the default criteria suggested by FLAG.

Appendix A

Application Forms

Form AQ101
Form AQ102
Form AQ210-CTG1
Form AQ210-CTG2
Form AQ210-CTG3
Form AQ210-CTG4
Form AQ210-EG1
Form AQ210-FP1
Form AQ230-CT1
Form AQ307-CO1
Form AQ307-CO2
Form AQ307-CO3
Form AQ307-CO4
Form AQ307-SCR1
Form AQ307-SCR2
Form AQ307-SCR3
Form AQ307-SCR4
Form AQ401
Form AQ402
Form AQ403

Print Form

FORM AQ101
ANSWER SHEET

ADMINISTRATIVE INFORMATION

FOR DEQ USE ONLY	
Permit Number:	Type of Application:
Application No:	RNW ____ MOD ____ NEW ____ EXT ____
Date Received :	
Regional Office:	Check No. Amount $

1. Company	2. Facility Location
Legal Name: Perennial-WindChaser LLC	Name: Perennial Wind Chaser Station
Mailing Address: 600 Third Avenue, 30 F	Street Address: Next to 78145 Westland Road
City, State, Zip Code: New York, NY 10016	City, County, Zip Code: Hermiston, Umatilla, 97838
Number of employees: 5-10	
3. Site Contact Person	**4. Standard Industrial Classification Code(s)**
Name: Richard Moroney	Primary: 4911
Title: General Manager of Hermiston Generating Plant	Secondary: *NAICS-221112*
Telephone number: 541-564-8320	**5. Other DEQ Permits**
Fax. number:	NPDES-1200-C Septic system approval
e-mail address: richard.moroney@perennialpower.net	

6. Permit Action:

- ☐ New Simple ACDP
- ☐ New Construction ACDP
- ☐ New Standard ACDP
- ☒ New Standard ACDP (PSD/NSR)
- ☐ Renewal of an existing permit without changes (include form AQ403 for Standard ACDPs)
- ☐ Renewal of an existing permit with changes (include form AQ403 for Standard ACDPs)
- ☐ Modification of existing permit

7. Signature

I hereby apply for permission to discharge air contaminants in the State of Oregon, as stated or described in this application, and certify that the information contained in this application and the schedules and exhibits appended hereto, are true and correct to the best of my knowledge and belief.

Shigenobu Hamada	President 212-207-0569
Name of official (Printed or Typed)	Title of official and phone number
S. Hamada	2013/8/26.
Signature of official	Date

FEE INFORMATION

(Make the check payable to DEQ)

Note: The initial application fees and annual fees specified below (OAR 340-216-0020, Table 2, Parts 1 and 2) are only required for initial permit applications. These fees are not required for an application to renew or modify an existing permit. The appropriate specific activity fee(s) specified below (OAR 340-216-0020, Table 2, Part 3) applies to permit modifications or may be in addition to initial permit application fees.

OAR 340-216-0020, Table 2, Part 1 – INITIAL PERMITTING APPLICATION FEES:	
Short Term Activity ACDP	
Simple ACDP	
Construction ACDP	
Standard ACDP	
Standard ACDP (PSD/NSR)	$42,000.00
OAR 340-216-0020, TABLE 2, PART 2 - ANNUAL FEES:	
Simple ACDP – Low fee class	
Simple ACDP – High fee class	
Standard ACDP	
OAR 340-216-0020, TABLE 2, PART 3 - SPECIFIC ACTIVITY FEES:	
Non-technical permit modification	
Non-PSD/NSR basic technical permit modification	
Non-PSD/NSR simple technical permit modification	
Non-PSD/NSR moderate technical permit modification	
Non-PSD/NSR complex technical permit modification	
PSD/NSR modification	
Modeling review (outside PSD/NSR)	
Public hearing at applicant's request	
State MACT determination	
TOTAL FEES	$42,000.00

SUBMIT TWO COPIES OF THE COMPLETED APPLICATION TO:

New or Modified Permits (include fees):	Permit Renewals (no fees):
Oregon Department of Environmental Quality Business Office 811 SW Sixth Avenue Portland, OR 97204-1390	Oregon Department of Environmental Quality Air Quality Program, Eastern Region Office 475 NE Bellevue Suite 110 Bend, Oregon 97701

Perennial Wind Chaser Station

The Facility will include four identical simple-cycle power blocks with a total nominal rating of 412 MW. Each block will consist of a GE LMS100 CTG and auxiliaries, a SCR module, catalytic oxidizer, tempering air fan, and an exhaust stack. A cooling tower will serve the four power blocks. The four CTGs will utilize pipeline natural gas. A diesel fired emergency generator and fire pump will also be part of the facility.

Facility Name: Perennial Wind Chaser Station   Permit Number:

Engine Information

1.	Device ID Number	CTG1
2.	Existing or future?	Future
3.	Date construction commenced	New
4.	Date installed/completed	New
5.	Special controls (if applicable)	Yes
6.	Manufacturer	GE or Equivalent
7.	Date manufactured	New
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	852.1 MMbtu/hr LHV
9.	Control device(s) (y/n; if y, identification number(s))	SCR1 & CO1

10. Description of device:

GE LMS100 Combustion Turbine Generator or equivalent controlled by SCR and catalytic oxidation.

Operating Schedule

11.	Projected maximum hours/day	24
12.	Projected maximum hours/year	4400 at full load/4736

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	pipeline natural gas	40,912 lbs/hr	186,886,016 lbs/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	90 feet
15.	Exit diameter (ft)	17 feet
16.	Design flowrate (dscf)	946,297 ACFM

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	Yes	recorder? (y/n)	Yes
engine load (y/n).	Yes	recorder? (y/n)	Yes
other (specify)	CEM for NOx & CO	recorder? (y/n)	Yes

Facility Name: Perennial Wind Chaser Station Permit Number:

Engine Information

1.	Device ID Number	CTG2
2.	Existing or future?	Future
3.	Date construction commenced	New
4.	Date installed/completed	New
5.	Special controls (if applicable)	Yes
6.	Manufacturer	GE or Equivalent
7.	Date manufactured	New
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	852.1 MMbtu/hr LHV
9.	Control device(s) (y/n; if y, identification number(s))	SCR1 & CO1

10. Description of device:

GE LMS100 Combustion Turbine Generator or equivalent controlled by SCR and catalytic oxidation.

Operating Schedule

11.	Projected maximum hours/day	24
12.	Projected maximum hours/year	4400 at full load/4736

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	pipeline natural gas	40,912 lbs/hr	186,886,016 lbs/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	90 feet
15.	Exit diameter (ft)	17 feet
16.	Design flowrate (dscf)	946,297 ACFM

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	Yes	recorder? (y/n)	Yes
engine load (y/n).	Yes	recorder? (y/n)	Yes
other (specify)	CEM for NOx & CO	recorder? (y/n)	Yes

INTERNAL COMBUSTION ENGINES AND TURBINES

Facility Name: Perennial Wind Chaser Station   Permit Number:

Engine Information

1.	Device ID Number	CTG3
2.	Existing or future?	Future
3.	Date construction commenced	New
4.	Date installed/completed	New
5.	Special controls (if applicable)	Yes
6.	Manufacturer	GE or Equivalent
7.	Date manufactured	New
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	852.1 MMbtu/hr LHV
9.	Control device(s) (y/n; if y, identification number(s))	SCR1 & CO1

10. Description of device:

GE LMS100 Combustion Turbine Generator or equivalent controlled by SCR and catalytic oxidation.

Operating Schedule

11.	Projected maximum hours/day	24
12.	Projected maximum hours/year	4400 at full load/4736

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	pipeline natural gas	40,912 lbs/hr	186,886,016 lbs/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	90 feet
15.	Exit diameter (ft)	17 feet
16.	Design flowrate (dscf)	946,297 ACFM

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	Yes	recorder? (y/n)	Yes
engine load (y/n).	Yes	recorder? (y/n)	Yes
other (specify)	CEM for NOx & CO	recorder? (y/n)	Yes

Facility Name: Perennial Wind Chaser Station Permit Number:

Engine Information

1.	Device ID Number	CTG4
2.	Existing or future?	Future
3.	Date construction commenced	New
4.	Date installed/completed	New
5.	Special controls (if applicable)	Yes
6.	Manufacturer	GE or Equivalent
7.	Date manufactured	New
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	852.1 MMbtu/hr LHV
9.	Control device(s) (y/n; if y, identification number(s))	SCR1 & CO1

10. Description of device:

GE LMS100 Combustion Turbine Generator or equivalent controlled by SCR and catalytic oxidation.

Operating Schedule

11.	Projected maximum hours/day	24
12.	Projected maximum hours/year	4400 at full load/4736

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	pipeline natural gas	40,912 lbs/hr	186,886,016 lbs/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	90 feet
15.	Exit diameter (ft)	17 feet
16.	Design flowrate (dscf)	946,297 ACFM

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	Yes	recorder? (y/n)	Yes
engine load (y/n).	Yes	recorder? (y/n)	Yes
other (specify)	CEM for NOx & CO	recorder? (y/n)	Yes

Facility Name: Perennial Wind Chaser Station   Permit Number:

Engine Information

1.	Device ID Number	EG Unit 1
2.	Existing or future?	Future
3.	Date construction commenced	
4.	Date installed/completed	
5.	Special controls (if applicable)	
6.	Manufacturer	Caterpillar or Equivalent
7.	Date manufactured	
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	671 Hp -500ekW
9.	Control device(s) (y/n; if y, identification number(s))	

10. Description of device:

Caterpillar Standby 500 ekW 625kVA engine or equivalent

Operating Schedule

11.	Projected maximum hours/day	1
12.	Projected maximum hours/year	100

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	Ultra-Low-Sulfur Diesel	36.6 gal/hr	3660 gal/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	6 feet
15.	Exit diameter (ft)	0.5 feet
16.	Design flowrate (dscf)	3842.2 acfm

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	No	recorder? (y/n)	No
engine load (y/n).	No	recorder? (y/n)	No
other (specify)	Hours	recorder? (y/n)	Yes

Facility Name: Perennial Wind Chaser Station Permit Number:

Engine Information

1.	Device ID Number	FP Unit 1
2.	Existing or future?	Future
3.	Date construction commenced	
4.	Date installed/completed	
5.	Special controls (if applicable)	
6.	Manufacturer	Clarke or Equivalent
7.	Date manufactured	
8.	Maximum rating (MMbtu/hr for turbines, Hp for others)	280
9.	Control device(s) (y/n; if y, identification number(s))	

10. Description of device:

Clarke JW6H-UFAD70 fire pump engine or equivalent

Operating Schedule

11.	Projected maximum hours/day	1
12.	Projected maximum hours/year	100

Fuel Information

13. Fuel usage:

	Type	Hourly usage	Annual usage
Primary	Ultra-Low-Sulfur Diesel	18.8 gal/hr	1880 gal/yr
Back-up	none		
Other			

Stack Information

14.	Exit height (ft)	6 feet
15.	Exit diameter (ft)	0.5 feet
16.	Design flowrate (dscf)	1867 acfm

Monitoring Information

17. Monitoring equipment

fuel flow (y/n)	No	recorder? (y/n)	No
engine load (y/n).	No	recorder? (y/n)	No
other (specify)	hours	recorder? (y/n)	Yes

Facility Name: Perennial Wind Chaser Station Permit Number:

Process Information

1. ID Number: CT1
2. Descriptive name: Cooling Tower
3. Existing or future?: Future
4. Date commenced: New
5. Date installed/completed: New

6. Description of process:

Cooling tower with high efficiency drift eliminators rated at 0.0005%

Operating Schedule

7. Seasonal or year-round?: year-round
8. Batch or continuous operation?: batch
9. Projected maximum hours/day: 24
10. Projected maximum hours/year: 5700
11. Process/device capacity:

Raw materials	Short term capacity amount	Short term capacity units	Annual usage amount	Annual usage units
cooling water (TDS 1000 ppm)	28000	gpm	9576	million gal per year

Products

12. Control device(s) (yes/no?) If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).

No

Facility Name: Perennial Wind Chaser Station Permit Number:

1.	Control Device ID	CO1
2.	Process/Device(s) Controlled	CTG1
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	95% CO, 29% VOC, 80% HAPs
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	6.0 ppmdv CO @ 15%O2 and 3.0 ppmdv VOC @15% O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, SCR1
9.	Describe the Control Device	
	Catalytic Oxidation Unit 1- the CTG exhaust stream passes over a catalyst bed which oxidizes the carbon monoxides (CO) and volatile organic compounds (VOC).	

Facility Name: Perennial Wind Chaser Station Permit Number:

1.	Control Device ID	CO2
2.	Process/Device(s) Controlled	CTG2
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	95% CO, 29% VOC, 80% HAPs
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	6.0 ppmdv CO @ 15%O2 and 3.0 ppmdv VOC @15% O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, SCR2
9.	Describe the Control Device	
	Catalytic Oxidation Unit 2- the CTG exhaust stream passes over a catalyst bed which oxidizes the carbon monoxides (CO) and volatile organic compounds (VOC).	

Facility Name: Perennial Wind Chaser Station

Permit Number:

1.	Control Device ID	CO3
2.	Process/Device(s) Controlled	CTG3
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	95% CO, 29% VOC, 80% HAPs
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	6.0 ppmdv CO @ 15%O2 and 3.0 ppmdv VOC @15% O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, SCR3
9.	Describe the Control Device	
	Catalytic Oxidation Unit 3- the CTG exhaust stream passes over a catalyst bed which oxidizes the carbon monoxides (CO) and volatile organic compounds (VOC).	

Facility Name: Perennial Wind Chaser Station

Permit Number:

1.	Control Device ID	CO4
2.	Process/Device(s) Controlled	CTG4
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	95% CO, 29% VOC, 80% HAPs
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	6.0 ppmdv CO @ 15%O2 and 3.0 ppmdv VOC @15% O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	Yes, SCR4
9.	Describe the Control Device	
	Catalytic Oxidation Unit 4- the CTG exhaust stream passes over a catalyst bed which oxidizes the carbon monoxides (CO) and volatile organic compounds (VOC).	

Facility Name: Perennial Wind Chaser Station

Permit Number:

1.	Control Device ID	SCR1
2.	Process/Device(s) Controlled	CTG1
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	Limit NOx to BACT
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	2.5 ppmdv @ 15%O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	NO
9.	Describe the Control Device	
	Selective Catalytic Reduction Unit 1- an aqueous ammonia solution is injected into the CTG exhaust stream that passes over a catalyst bed. The nitrogen oxides are reduced to inert nitrogen	

Facility Name: Perennial Wind Chaser Station   Permit Number:

1.	Control Device ID	SCR2
2.	Process/Device(s) Controlled	CTG2
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	Limit NOx to BACT
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	2.5 ppmdv @ 15%O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	NO
9.	Describe the Control Device	
	Selective Catalytic Reduction Unit 2- an aqueous ammonia solution is injected into the CTG exhaust stream that passes over a catalyst bed. The nitrogen oxides are reduced to inert nitrogen	

Facility Name: Perennial Wind Chaser Station Permit Number:

1.	Control Device ID	SCR3
2.	Process/Device(s) Controlled	CTG3
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	Limit NOx to BACT
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	2.5 ppmdv @ 15%O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	NO
9.	Describe the Control Device	
	Selective Catalytic Reduction Unit 3- an aqueous ammonia solution is injected into the CTG exhaust stream that passes over a catalyst bed. The nitrogen oxides are reduced to inert nitrogen	

Facility Name: Perennial Wind Chaser Station

Permit Number:

1.	Control Device ID	SCR4
2.	Process/Device(s) Controlled	CTG4
3.	Year installed	New
4.	Manufacturer/Model No.	To be determined
5.	Control Efficiency(%)	Limit NOx to BACT
6.	Design inlet gas flow rate (acfm)	946297 ACFM
7.	Design parameter(s)	2.5 ppmdv @ 15%O2
8.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	NO
9.	Describe the Control Device	
	Selective Catalytic Reduction Unit 4- an aqueous ammonia solution is injected into the CTG exhaust stream that passes over a catalyst bed. The nitrogen oxides are reduced to inert nitrogen	

Facility Name: Hermiston Generating Plant Permit Number: 30-0113-TV-01

Baseline Period: 1978 Greenhouse Gas Baseline Period: 2001

Emissions Data

1. Emissions Point	2. Annual Production Rate (specify units)	3. Pollutant	4. Emission Factor	5. EF reference	6. Annual Emissions (tons/yr)
Facility		PM/PM10/PM2.5			0
Facility		CO			0
Facility		NOx			0
Facility		SO2			0
Facility		VOC			0
Facility		GHG			1,680,000
Example:	387 million lbs of steam/yr	NO_x	0.31 lb NO_x/ 1000 lb of steam	DEQ	60 tons/yr

State of Oregon Department of Environmental Quality

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

Facility Name: Hermiston Generating Plant

Permit Number: 30-0113-TV-01

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
Facility			PM/PM10/PM/2.5					64
Facility			CO					447
Facility			NOx					272
Facility			SO2					33
Facility			VOC					39
Facility			GHG					1,768,000
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	13.2
CTG2	945 MMBtu/hr	4,400 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	13.2
CTG3	945 MMBtu/hr	4,400 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	13.2
CTG4	945 MMBtu/hr	4,400 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	13.2
CTG1 SU	945 MMBtu/hr	250 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.75
CTG2 SU	945 MMBtu/hr	250 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.75
CTG3 SU	945 MMBtu/hr	250 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.75
CTG4 SU	945 MMBtu/hr	250 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.75
CTG1 SD	945 MMBtu/hr	86 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.26
CTG2 SD	945 MMBtu/hr	86 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.26
CTG3 SD	945 MMBtu/hr	86 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.26
CTG4 SD	945 MMBtu/hr	86 hours	PM/PM10/PM2.5	0.00635 lbs/MMBtu		Vendor	6.0 lbs/hr	0.26
EG	500 Kw	100 hours	PM/PM10/PM2.5	0.2 grams/Kw-hr		Tier 3-NSPS	0.22 lbs/hr	.011
FP	260 Kw	100 hours	PM/PM10/PM2.5	0.2 grams/Kw-hr		Tier 3-NSPS	0.12 lbs/hr	.006
CT	28,000 gpm	5236 hours	PM/PM10/PM2.5	.0005%@1000ppm		Vendor	0.7 lbs/hr	1.83
Total			PM/PM10/PM2.5					58.7
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	CO	0.01325 lbs/MMBtu		Vendor	12.52 lbs/hr	27.5
CTG2	945 MMBtu/hr	4,400 hours	CO	0.01325 lbs/MMBtu		Vendor	12.52 lbs/hr	27.5
CTG3	945 MMBtu/hr	4,400 hours	CO	0.01325 lbs/MMBtu		Vendor	12.52 lbs/hr	27.5
CTG4	945 MMBtu/hr	4,400 hours	CO	0.01325 lbs/MMBtu		Vendor	12.52 lbs/hr	27.5
CTG1 SU	945 MMBtu/hr	250 hours	CO	0.18652 lbs/MMBtu		Vendor	176.26 lbs/hr	22.0
CTG2 SU	945 MMBtu/hr	250 hours	CO	0.18652 lbs/MMBtu		Vendor	176.26 lbs/hr	22.0
CTG3 SU	945 MMBtu/hr	250 hours	CO	0.18652 lbs/MMBtu		Vendor	176.26 lbs/hr	22.0
CTG4 SU	945 MMBtu/hr	250 hours	CO	0.18652 lbs/MMBtu		Vendor	176.26 lbs/hr	22.0
CTG1 SD	945 MMBtu/hr	86 hours	CO	0.08940 lbs/MMBtu		Vendor	84.48 lbs/hr	3.63
CTG2 SD	945 MMBtu/hr	86 hours	CO	0.08940 lbs/MMBtu		Vendor	84.48 lbs/hr	3.63
CTG3 SD	945 MMBtu/hr	86 hours	CO	0.08940 lbs/MMBtu		Vendor	84.48 lbs/hr	3.63
CTG4 SD	945 MMBtu/hr	86 hours	CO	0.08940 lbs/MMBtu		Vendor	84.48 lbs/hr	3.63
EG	500 Kw	100 hours	CO	3.5 grams/Kw-hr		Tier 3-NSPS	3.85 lbs/hr	.019
FP	260 Kw	100 hours	CO	3.5 grams/Kw-hr		Tier 3-NSPS	2.16 lbs/hr	.011
Total								213.1
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

State of Oregon Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	NOx	0.00907 lbs/MMBtu		Vendor	8.57 lbs/hr	18.85
CTG2	945 MMBtu/hr	4,400 hours	NOx	0.00907 lbs/MMBtu		Vendor	8.57 lbs/hr	18.85
CTG3	945 MMBtu/hr	4,400 hours	NOx	0.00907 lbs/MMBtu		Vendor	8.57 lbs/hr	18.85
CTG4	945 MMBtu/hr	4,400 hours	NOx	0.00907 lbs/MMBtu		Vendor	8.57 lbs/hr	18.85
CTG1 SU	945 MMBtu/hr	250 hours	NOx	0.06620 lbs/MMBtu		Vendor	62.56 lbs/hr	7.82
CTG2 SU	945 MMBtu/hr	250 hours	NOx	0.06620 lbs/MMBtu		Vendor	62.56 lbs/hr	7.82
CTG3 SU	945 MMBtu/hr	250 hours	NOx	0.06620 lbs/MMBtu		Vendor	62.56 lbs/hr	7.82
CTG4 SU	945 MMBtu/hr	250 hours	NOx	0.06620 lbs/MMBtu		Vendor	62.56 lbs/hr	7.82
CTG1 SD	945 MMBtu/hr	86 hours	NOx	0.02443 lbs/MMBtu		Vendor	23.09 lbs/hr	0.99
CTG2 SD	945 MMBtu/hr	86 hours	NOx	0.02443 lbs/MMBtu		Vendor	23.09 lbs/hr	0.99
CTG3 SD	945 MMBtu/hr	86 hours	NOx	0.02443 lbs/MMBtu		Vendor	23.09 lbs/hr	0.99
CTG4 SD	945 MMBtu/hr	86 hours	NOx	0.02443 lbs/MMBtu		Vendor	23.09 lbs/hr	0.99
EG	500 Kw	100 hours	NOx	3.9 grams/Kw-hr		Tier 3-NSPS	4.3 lbs/hr	0.21
FP	260 Kw	100 hours	NOx	3.9 grams/Kw-hr		Tier 3-NSPS	2.41 lbs/hr	0.12
Total			NOx					111.0
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

State of Oregon Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	VOC	0.00378 lbs/MMBtu		Vendor	3.58 lbs/hr	7.88
CTG2	945 MMBtu/hr	4,400 hours	VOC	0.00378 lbs/MMBtu		Vendor	3.58 lbs/hr	7.88
CTG3	945 MMBtu/hr	4,400 hours	VOC	0.00378 lbs/MMBtu		Vendor	3.58 lbs/hr	7.88
CTG4	945 MMBtu/hr	4,400 hours	VOC	0.00378 lbs/MMBtu		Vendor	3.58 lbs/hr	7.88
CTG1 SU	945 MMBtu/hr	250 hours	VOC	0.00384 lbs/MMBtu		Vendor	3.63 lbs/hr	0.45
CTG2 SU	945 MMBtu/hr	250 hours	VOC	0.00384 lbs/MMBtu		Vendor	3.63 lbs/hr	0.45
CTG3 SU	945 MMBtu/hr	250 hours	VOC	0.00384 lbs/MMBtu		Vendor	3.63 lbs/hr	0.45
CTG4 SU	945 MMBtu/hr	250 hours	VOC	0.00384 lbs/MMBtu		Vendor	3.63 lbs/hr	0.45
CTG1 SD	945 MMBtu/hr	86 hours	VOC	0.00129 lbs/MMBtu		Vendor	1.22 lbs/hr	0.05
CTG2 SD	945 MMBtu/hr	86 hours	VOC	0.00129 lbs/MMBtu		Vendor	1.22 lbs/hr	0.05
CTG3 SD	945 MMBtu/hr	86 hours	VOC	0.00129 lbs/MMBtu		Vendor	1.22 lbs/hr	0.05
CTG4 SD	945 MMBtu/hr	86 hours	VOC	0.00129 lbs/MMBtu		Vendor	1.22 lbs/hr	0.05
EG	500 Kw	100 hours	VOC	0.1 grams/Kw-hr		Tier 3-NSPS	0.11 lbs/hr	0.006
FP	260 Kw	100 hours	VOC	0.1 grams/Kw-hr		Tier 3-NSPS	0.06 lbs/hr	0.003
				.				
Total			VOC					33.5
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

State of Oregon
Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	1.25
CTG2	945 MMBtu/hr	4,400 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	1.25
CTG3	945 MMBtu/hr	4,400 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	1.25
CTG4	945 MMBtu/hr	4,400 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	1.25
CTG1 SU	945 MMBtu/hr	250 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.071
CTG2 SU	945 MMBtu/hr	250 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.071
CTG3 SU	945 MMBtu/hr	250 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.071
CTG4 SU	945 MMBtu/hr	250 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.071
CTG1 SD	945 MMBtu/hr	86 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.024
CTG2 SD	945 MMBtu/hr	86 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.024
CTG3 SD	945 MMBtu/hr	86 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.024
CTG4 SD	945 MMBtu/hr	86 hours	SO2	0.0028 lbs/MMBtu	0.00060 lbs/MMBtu	Eng Review	2.66 lbs/hr	0.024
EG	36.6 gal/hr	100 hours	SO2	15 ppm S		Tier 3-NSPS	0.008 lbs/hr	0.0004
FP	18.8 gal/hr	100 hours	SO2	15 ppm S		Tier 3-NSPS	0.004 lbs/hr	0.0002
				.				
Total			SO2					5.4
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

State of Oregon Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates: 2. Short-term (Specify units)	Production Rates: 3. Annual (Specify units)	4. Pollutant	Emissions Factors: 5. Short-term	Emissions Factors: 6. Long-term	Emissions Factors: 7. Reference(s)	Emissions: 8. Short-term (Specify units)	Emissions: 9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.955
CTG2	945 MMBtu/hr	4,400 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.955
CTG3	945 MMBtu/hr	4,400 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.955
CTG4	945 MMBtu/hr	4,400 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.955
CTG1 SU	945 MMBtu/hr	250 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.054
CTG2 SU	945 MMBtu/hr	250 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.054
CTG3 SU	945 MMBtu/hr	250 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.054
CTG4 SU	945 MMBtu/hr	250 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.054
CTG1 SD	945 MMBtu/hr	86 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.019
CTG2 SD	945 MMBtu/hr	86 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.019
CTG3 SD	945 MMBtu/hr	86 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.019
CTG4 SD	945 MMBtu/hr	86 hours	SAM	0.00046 lbs/MMBtu		Eng Review	0.434 lbs/hr	0.019
EG	36.6 gal/hr	100 hours	SAM	15 ppm S		Tier 3-NSPS	0.006 lbs/hr	0.0003
FP	18.8 gal/hr	100 hours	SAM	15 ppm S		Tier 3-NSPS	0.003 lbs/hr	0.0002
				.				
Total			SAM					4.1
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

State of Oregon Department of Environmental Quality

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	243,492
CTG2	945 MMBtu/hr	4,400 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	243,492
CTG3	945 MMBtu/hr	4,400 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	243,492
CTG4	945 MMBtu/hr	4,400 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	243,492
CTG1 SU	945 MMBtu/hr	250 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	13,835
CTG2 SU	945 MMBtu/hr	250 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	13,835
CTG3 SU	945 MMBtu/hr	250 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	13,835
CTG4 SU	945 MMBtu/hr	250 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	13,835
CTG1 SD	945 MMBtu/hr	86 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	4,759
CTG2 SD	945 MMBtu/hr	86 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	4,759
CTG3 SD	945 MMBtu/hr	86 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	4,759
CTG4 SD	945 MMBtu/hr	86 hours	CO_2	117.12 lbs/MMBtu		Mass Balance	110,700 lbs/hr	4,759
EG	36.6 gal/hr	100 hours	CO_2	164 lbs/MMBtu		AP-42 Table 3.3-1	817 lbs/hr	40.8
FP	18.8 gal/hr	100 hours	CO_2	164 lbs/MMBtu		AP-42 Table 3.3-1	420 lbs/hr	21.0
				.				
Total			CO_2					1,048,408
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

State of Oregon Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates: 2. Short-term (Specify units)	Production Rates: 3. Annual (Specify units)	4. Pollutant	Emissions Factors: 5. Short-term	Emissions Factors: 6. Long-term	Emissions Factors: 7. Reference(s)	Emissions: 8. Short-term (Specify units)	Emissions: 9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	17.9
CTG2	945 MMBtu/hr	4,400 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	17.9
CTG3	945 MMBtu/hr	4,400 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	17.9
CTG4	945 MMBtu/hr	4,400 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	17.9
CTG1 SU	945 MMBtu/hr	250 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	1.0
CTG2 SU	945 MMBtu/hr	250 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	1.0
CTG3 SU	945 MMBtu/hr	250 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	1.0
CTG4 SU	945 MMBtu/hr	250 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	1.0
CTG1 SD	945 MMBtu/hr	86 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	0.35
CTG2 SD	945 MMBtu/hr	86 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	0.35
CTG3 SD	945 MMBtu/hr	86 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	0.35
CTG4 SD	945 MMBtu/hr	86 hours	Methane	0.0086 lbs/MMBtu		AP-42 Table 3.1-2a	8.13 lbs/hr	0.35
EG	36.6 gal/hr	100 hours	Methane	0.0061 lbs/MMBtu		CFR 98 Table C-2	0.03 lbs/hr	0.002
FP	18.8 gal/hr	100 hours	Methane	0.0061 lbs/MMBtu		CFR 98 Table C-2	0.02 lbs/hr	0.001
				.				
Total			Methane					77
Total			CO2e					1,617
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Plant Site Emissions Detail Sheet
Current/Future Operations

Form AQ402
Answer Sheet

State of Oregon Department of Environmental Quality

Facility Name: Perennial Wind Chaser Station *Permit Number:*

1. Emissions Point	Production Rates		4. Pollutant	Emissions Factors			Emissions	
	2. Short-term (Specify units)	3. Annual (Specify units)		5. Short-term	6. Long-term	7. Reference(s)	8. Short-term (Specify units)	9. Annual (tons/year)
CTG1	945 MMBtu/hr	4,400 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	6.24
CTG2	945 MMBtu/hr	4,400 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	6.24
CTG3	945 MMBtu/hr	4,400 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	6.24
CTG4	945 MMBtu/hr	4,400 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	6.24
CTG1 SU	945 MMBtu/hr	250 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.35
CTG2 SU	945 MMBtu/hr	250 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.35
CTG3 SU	945 MMBtu/hr	250 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.35
CTG4 SU	945 MMBtu/hr	250 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.35
CTG1 SD	945 MMBtu/hr	86 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.12
CTG2 SD	945 MMBtu/hr	86 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.12
CTG3 SD	945 MMBtu/hr	86 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.12
CTG4 SD	945 MMBtu/hr	86 hours	N2O	0.003 lbs/MMBtu		AP-42 Table 3.1-2a	2.84 lbs/hr	0.12
EG	36.6 gal/hr	100 hours	N2O	0.00132 lbs/MMBtu		CFR 98 Table C-2	0.007 lbs/hr	0.0003
FP	18.8 gal/hr	100 hours	N2O	0.00132 lbs/MMBtu		CFR 98 Table C-2	0.003 lbs/hr	0.0002
				.				
Total			N2O					27
Total			CO2e					8,325
Total			All COe					1,058,349
Example	200 tons of rock/hr	400,000 tons	PM	0.04 lb/ton	0.04 lb/ton	DEQ	8.0 lb/hr	8.0

Facility Name: Perennial Wind Chaser Station Permit Number: ____________

Emissions Data

1. Emissions Point	2. Annual Production Rate (specify units)	3. Pollutant	4. Emission Factor	5. EF reference	6. Annual Emissions (tons/yr)
CTG1	4,475,520 MMBtu*	Formaldhyde	7.1E-4 lbs/MMBtu	AP-42 Table 3.1-3	0.32***
CTG2	4,475,520 MMBtu*	Formaldhyde	7.1E-4 lbs/MMBtu	AP-42 Table 3.1-3	0.32***
CTG3	4,475,520 MMBtu*	Formaldhyde	7.1E-4 lbs/MMBtu	AP-42 Table 3.1-3	0.32***
CTG4	4,475,520 MMBtu*	Formaldhyde	7.1E-4 lbs/MMBtu	AP-42 Table 3.1-3	0.32***
EG	498 MMBtu****	Formaldhyde	1.18E-3 lbs/MMBtu	AP-42 Table 3.3-2	0.0003
FP	256 MMBtu****	Formaldhyde	1.18E-3 lbs/MMBtu	AP-42 Table 3.3-2	0.0002
Total		Formaldhyde			1.3
CTG1	4,475,520 MMBtu*	Total HAPs	1.03E-3lbs/MMBtu**	AP-42 Table 3.1-3	0.46***
CTG2	4,475,520 MMBtu*	Total HAPs	1.03E-3lbs/MMBtu**	AP-42 Table 3.1-3	0.46***
CTG3	4,475,520 MMBtu*	Total HAPs	1.03E-3lbs/MMBtu**	AP-42 Table 3.1-3	0.46***
CTG4	4,475,520 MMBtu*	Total HAPs	1.03E-3lbs/MMBtu**	AP-42 Table 3.1-3	0.46***
EG	498 MMBtu****	Total HAPs	3.87E-3lbs/MMBtu**	AP-42 Table 3.3-2	0.001
FP	256 MMBtu****	Total HAPs	3.87E-3lbs/MMBtu**	AP-42 Table 3.3-2	0.0005
Total		Total HAPs			1.8
*4736 hours					
**summed table					
***80% Control					
****100 hours					

Applications for Standard ACDPs must also include the most recent Toxics Release Inventory report, if applicable (see instructions).

Appendix B

BACT Support Documentation

RBLC Search Results

List of Reports Help

Your search has found **21** facilities and **27** processes that match your search criteria. You can view details for one or more facilities by clicking on the highlighted RBLC identifier or the process description in the list below. To create a report, select one of the standard output formats from the list of reports at the bottom of this page. Only facilities that are checked in the table below will be included in your report. Click on the check box next to any facility to switch between checked and unchecked or use the "Check" or "Un-Check" all facilities buttons at the top of the list to check or uncheck all records in the list.

Please note that the use of your browser's BACK button to change the search conditions may result in inaccurate results.

Matching Facilities for Search Criteria : Tips

Permit Date Between 1/1/2008 And 04/24/2013
And Process Type = 15.110
And Pollutant Name Like NOX

These results are for USA only.

Check Un-Check **ALL Facilities** New Search

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.

RBLC ID Sort By	CORPORATE/COMPANY & FACILITY NAME Sort By	PROCESS CODE	PROCESS DESCRIPTION	PERMIT NUMBER & PERMIT DATE Sort By
☑ *CA-1223	PIO PICO ENERGY CENTER, LLC PIO PICO ENERGY CENTER	15.110	COMBUSTION TURBINES (NORMAL OPERATION)	SD 11-01 11/19/2012
		15.110	COMBUSTION TURBINES (STARTUP & SHUTDOWN PERIODS)	
☑ *WY-0070	BLACK HILLS POWER, INC. CHEYENNE PRAIRIE GENERATING STATION	15.110	Simple Cycle Trubine (EP04)	CT-12636 08/28/2012
		15.110	Simple Cycle Turbine (EP05)	
		15.110	Simple Cycle Turbine (EP03)	
☑ LA-0258	ENTERGY GULF STATES LA LLC CALCASIEU PLANT	15.110	TURBINE EXHAUST STACK NO. 1 & NO. 2	PSD-LA-746 12/21/2011
☑ LA-0257	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL SABINE PASS LNG TERMINAL	15.110	Simple Cycle Refrigeration Compressor Turbines (16)	PSD-LA-703 (M3) 12/06/2011
		15.110	Simple Cycle Generation Turbines (2)	
☑ NM-0051	SOUTHWESTERN PUBLIC SERVICE CO. CUNNINGHAM POWER PLANT	15.110	Normal Mode (without Power Augmentation)	PSD-NM-622-M3 05/02/2011
		15.110	Power Augmentation	
☑ NJ-0076	PSEG FOSSIL LLC PSEG FOSSIL LLC KEARNY GENERATING STATION	15.110	SIMPLE CYCLE TURBINE	12200-BOP100002 10/27/2010
☑ NJ-0077	VINELAND MUNICIPAL ELECTRIC UTILITY (VMEU) HOWARD DOWN STATION	15.110	SIMPLE CYCLE (NO WASTE HEAT RECOVERY)(>25 MW)	75507-BOP090003 09/16/2010
☑ GA-0139	SOUTHERN POWER COMPANY DAHLBERG COMBUSDTION	15.110	SIMPLE CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT	4911-157-0034-V-04-1 05/14/2010

	TURBINE ELECTRIC GENERATING FACILITY (P			
☑ CA-1174	EL CAJON ENERGY LLC EL CAJON ENERGY LLC	15.110	Gas turbine simple cycle	987824 12/11/2009
☑ OH-0333	DAYTON POWER & LIGHT COMPANY DAYTON POWER & LIGHT ENERGY LLC	15.110	Turbines (4), simple cycle, natural gas	P0104867 12/03/2009
☑ NJ-0075	BAYONNE ENERGY CENTER, LLC BAYONNE ENERGY CENTER	15.110	COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8	12863-BOP080001 09/24/2009
☑ FL-0319	JACKSONVILLE ELECTRIC AUTHORITY (JEA) GREENLAND ENERGY CENTER	15.110	190 MW Combustion Turbine	PSD-FL-401 03/10/2009
☑ TX-0540	BOSQUE POWER COMPANY LLC BOSQUE COUNTY POWER PLANT	15.110	ELECTRICAL GENERATION	40620 02/27/2009
☑ FL-0310	SHADY HILLS POWER COMPANY SHADY HILLS GENERATING STATION	15.110	TWO SIMPLE CYCLE COMBUSTION TURBINE - MODEL 7FA	PSD-FL-402 01/12/2009
☑ CA-1176	 ORANGE GROVE PROJECT	15.110	Gas turbine simple cycle	985708 12/04/2008
☑ MD-0040	COMPETITIVE POWER VENTURES, INC./CPV MARYLAND, LLC CPV ST CHARLES	15.110	COMBUSTION TURBINES (2)	CPCN CASE NO. 9129 11/12/2008
☑ CA-1175	 ESCONDIDO ENERGY CENTER LLC	15.110	Gas turbine simple cycle	985693 07/02/2008
☑ MN-0075	GREAT RIVER ENERGY GREAT RIVER ENERGY - ELK RIVER STATION	15.110	COMBUSTION TURBINE GENERATOR	14100003-004 07/01/2008
☑ OK-0127	WESTERN FARMERS ELECTRIC COOPERATIVE WESTERN FARMERS ELECTRIC ANADARKO	15.110	COMBUSTION TURBINE PEAKING UNIT (S)	2005-037-C (M-2) PSD 06/13/2008
☐ FL-0305	ORLANDO UTILITIES COMMISSION (OUC) OUC CURTIS H. STANTON ENERGY CENTER	15.110	300 MW COMBINED CYCLE COMBUSTION TURBINE	PSD-FL-373A AND 0950137-020-AC 05/12/2008
☑ LA-0224	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO) ARSENAL HILL POWER PLANT	15.110	SCN-3 COLD STARTUP CTG-1 SCN-7 COLD STARTUP CTG-2	PSD-LA-726 03/20/2008
		15.110	SCN-5 SHUTDOWN CTG-1 / SCN-9 SHUTDOWN CTG-2	

Check Un-Check **ALL Facilities**

Back to Top of Page

○ Show All Records ◉ Show Only Selected Records On This Page

Formatting your report may take a while, especially if your facility has a large number of processes and pollutants. The detail reports take the longest amount of time because they include the most information. Please be patient after you select "Create report"

Help

○ Process Index Report ○ TXT ◉ pdf
○ Process Type Summary(with Agency Contact Info) ○ TXT ◉ pdf
○ Comprehensive Report ◉ TXT ○ pdf
◉ Free Form Report(Customizable Fields Selection)
○ Free Form Report ○ TXT ◉ pdf
○ Export/Import Report(ASCII Delineated Text)

Create report

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Report Date: 04/24/2013 Control Technology Determinations (Freeform)

Facility Information: PIO PICO ENERGY CENTER

RBLC ID:	*CA-1223
+Corporate/Company Name:	PIO PICO ENERGY CENTER, LLC
+Facility Name:	PIO PICO ENERGY CENTER
Facility County:	OTAY MESA
Facility State:	CA
Facility ZIP Code:	92154
EPA Region:	9
+SIC Code:	4911
Permit Issuance Date:	11/19/2012 ACT
Date determination entered in RBLC:	03/05/2013

Process Information: PIO PICO ENERGY CENTER

+Process Name:	COMBUSTION TURBINES (NORMAL OPERATION)
Primary Fuel:	NATURAL GAS

Pollutant Information: PIO PICO ENERGY CENTER - COMBUSTION TURBINES (NORMAL OPERATION)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	WATER INJECTION, SCR
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	@15% O2, 1-HR AVG

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	PUC-QUALITY NATURAL GAS
Emission Limit 1:	0.0065
Emission Limit 1 Unit:	LB/MMBTU (HHV)
Emission Limit 1 Avg. Time/Condition:	AT LOADS OF 80% OR HIGHER

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)

+Control Method	
Description:	PUC-QUALITY NATURAL GAS
Emission Limit 1:	0.0065
Emission Limit 1 Unit:	LB/MMBTU (HHV)
Emission Limit 1 Avg. Time/Condition:	AT LOADS OF 80% OR HIGHER

+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	PUC-QUALITY NATURAL GAS
Emission Limit 1:	0.0065
Emission Limit 1 Unit:	LB/MMBTU (HHV)
Emission Limit 1 Avg. Time/Condition:	AT LOADS OF 80% OR HIGHER

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	
Emission Limit 1:	1328.0000
Emission Limit 1 Unit:	LB/MW-HR
Emission Limit 1 Avg. Time/Condition:	GROSS OUTPUT

Process Information: PIO PICO ENERGY CENTER

+Process Name:	COMBUSTION TURBINES (STARTUP & SHUTDOWN PERIODS)
Primary Fuel:	NATURAL GAS

Pollutant Information: PIO PICO ENERGY CENTER - COMBUSTION TURBINES (STARTUP & SHUTDOWN PERIODS)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	water injection and SCR system
Emission Limit 1:	22.5000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	STARTUP EVENTS

Process Information: PIO PICO ENERGY CENTER

+Process Name:	PARTIAL DRY COOLING SYSTEM
Primary Fuel:	

Pollutant Information: PIO PICO ENERGY CENTER - PARTIAL DRY COOLING SYSTEM

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	
Emission Limit 1:	0.0010
Emission Limit 1 Unit:	%
Emission Limit 1 Avg. Time/Condition:	COOLING TOWER DRIFT RATE

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	
Emission Limit 1:	0.0010
Emission Limit 1 Unit:	%
Emission Limit 1 Avg. Time/Condition:	COOLING TOWER DRIFT RATE

+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
+Control Method Description:	
Emission Limit 1:	0.0010
Emission Limit 1 Unit:	%
Emission Limit 1 Avg. Time/Condition:	COOLING TOWER DRIFT RATE

Process Information: PIO PICO ENERGY CENTER

+Process Name:	CIRCUIT BREAKERS
Primary Fuel:	

Pollutant Information: PIO PICO ENERGY CENTER - CIRCUIT BREAKERS

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	INSTALL, OPERATE, AND MAINTAIN ENCLOSED-PRESSURE SF6 CIRCUIT BREAKERS WITH A MAXIMUM ANNUAL LEAKAGE RATE OF 0.5% BY WEIGHT
Emission Limit 1:	40.2000
Emission Limit 1 Unit:	TPY
Emission Limit 1 Avg. Time/Condition:	TONS PER CALENDAR YEAR

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: CHEYENNE PRAIRIE GENERATING STATION

RBLC ID:	*WY-0070
+Corporate/Company Name:	BLACK HILLS POWER, INC.
+Facility Name:	CHEYENNE PRAIRIE GENERATING STATION
Facility County:	LARAMIE
Facility State:	WY
Facility ZIP Code:	82009
EPA Region:	8
+SIC Code:	491
Permit Issuance Date:	08/28/2012 ACT
Date determination entered in RBLC:	08/23/2012

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Combined Cycle Turbine (EP01)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Combined Cycle Turbine (EP01)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR
+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	good combustion practices
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Ammonia (NH3)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	PPM AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Combined Cycle Turbine (EP02)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Combined Cycle Turbine (EP02)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2

Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	good combustion practices
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Ammonia (NH3)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Simple Cycle Turbine (EP03)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Simple Cycle Turbine (EP03)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidiation Catalyst
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	3.0000

Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	good combustion practices
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Ammonia (NH3)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Simple Cycle Trubine (EP04)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Simple Cycle Trubine (EP04)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation Catalyst

Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	good combustion practices
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Ammonia (NH3)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Simple Cycle Turbine (EP05)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Simple Cycle Turbine (EP05)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	1-HOUR AVERAGE

+Pollutant Name	Volatile Organic Compounds (VOC)

+Control Method Description:	Oxidation Catalyst
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	good combustion practices
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/HR
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Ammonia (NH3)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	PPMV AT 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP06)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP06)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low-NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP07)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP07)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP08)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP08)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP09)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP09)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP10)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP10)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Inlet Air Heater (EP11)
Primary Fuel:	Natural Gas

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Inlet Air Heater (EP11)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Ultra Low NOx Burners
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE
+Pollutant Name	Carbon Monoxide
+Control Method Description:	good combustion practices
Emission Limit 1:	0.0800
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Diesel Emergency Generator (EP15)
Primary Fuel:	Ultra Low Sulfur Diesel

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Diesel Emergency Generator (EP15)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	EPA Tier 2 rated
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	Ultra Low Sulfur Diesel
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Carbon Monoxide
+Control Method Description:	EPA Tier 2 rated
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	

Process Information: CHEYENNE PRAIRIE GENERATING STATION

+Process Name:	Diesel Fire Pump Engine (EP16)
Primary Fuel:	Ultra Low Sulfur Diesel

Pollutant Information: CHEYENNE PRAIRIE GENERATING STATION - Diesel Fire Pump Engine (EP16)

+Pollutant Name	Carbon Monoxide
+Control Method Description:	EPA Tier 3 rated
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	EPA Tier 3 rated
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	Ultra Low Sulfur Diesel
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: CALCASIEU PLANT

RBLC ID:	LA-0258
+Corporate/Company Name:	ENTERGY GULF STATES LA LLC
+Facility Name:	CALCASIEU PLANT
Facility County:	CALCASIEU
Facility State:	LA
Facility ZIP Code:	70665
EPA Region:	6
+SIC Code:	4911
Permit Issuance Date:	12/21/2011 ACT
Date determination entered in RBLC:	02/01/2012

Process Information: CALCASIEU PLANT

+Process Name:	TURBINE EXHAUST STACK NO. 1 & NO. 2
Primary Fuel:	NATURAL GAS

Pollutant Information: CALCASIEU PLANT - TURBINE EXHAUST STACK NO. 1 & NO. 2

+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
+Control Method Description:	USE OF PIPELINE NATURAL GAS
Emission Limit 1:	17.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM
+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	USE OF PIPELINE NATURAL GAS
Emission Limit 1:	17.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	DRY LOW NOX COMBUSTORS
Emission Limit 1:	240.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Monoxide
+Control Method Description:	DRY LOW NOX COMBUSTORS
Emission Limit 1:	781.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	DRY LOW NOX COMBUSTORS
Emission Limit 1:	7.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: SABINE PASS LNG TERMINAL

RBLC ID:	LA-0257
+Corporate/Company Name:	SABINE PASS LNG, LP & SABINE PASS LIQUEFACTION, LL
+Facility Name:	SABINE PASS LNG TERMINAL
Facility County:	CAMERON
Facility State:	LA
Facility ZIP Code:	70631
EPA Region:	6
+SIC Code:	4925
Permit Issuance Date:	12/06/2011 ACT
Date determination entered in RBLC:	01/23/2012

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Generator Engines (2)
Primary Fuel:	Natural Gas

Pollutant Information: SABINE PASS LNG TERMINAL - Generator Engines (2)

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	fueled by natural gas

Emission Limit 1:	0.7500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Comply with 40 CFR 60 Subpart JJJJ
Emission Limit 1:	9.7600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Comply with 40 CFR 60 Subpart JJJJ
Emission Limit 1:	19.5100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Comply with 40 CFR 60 Subpart JJJJ
Emission Limit 1:	4.4300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	Fueled by natural gas, good combustion/operating practices
Emission Limit 1:	412.0000
Emission Limit 1 Unit:	TONS/YR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Simple Cycle Refrigeration Compressor Turbines (16)
Primary Fuel:	Natural Gas

Pollutant Information: SABINE PASS LNG TERMINAL - Simple Cycle Refrigeration Compressor Turbines (16)

+Pollutant Name	Particulate matter, total (TPM)

+Control Method
Description: Good combustion practices and fueled by natural gas
Emission Limit 1: 2.0800
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg. Time/Condition: HOURLY MAXIMUM

+Pollutant Name Volatile Organic Compounds (VOC)
+Control Method
Description: Good combustion practices and fueled by natural gas
Emission Limit 1: 0.6600
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg. Time/Condition: HOURLY MAXIMUM

+Pollutant Name Nitrogen Oxides (NOx)
+Control Method
Description: water injection
Emission Limit 1: 22.9400
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg. Time/Condition: HOURLY MAXIMUM

+Pollutant Name Carbon Monoxide
+Control Method
Description: Good combustion practices and fueled by natural gas
Emission Limit 1: 43.6000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg. Time/Condition: HOURLY MAXIMUM

+Pollutant Name Carbon Dioxide Equivalent (CO2e)
+Control Method Description: Good combustion/operating practices and fueled by natural gas - use GE LM2500+G4 turbines
Emission Limit 1: 4872107.0000
Emission Limit 1 Unit: TONS/YR
Emission Limit 1 Avg. Time/Condition: ANNUAL MAXIMUM FROM THE FACILITYWIDE

Process Information: SABINE PASS LNG TERMINAL

+Process Name: Combined Cycle Refrigeration Compressor Turbines (8)
Primary Fuel: natural gas

Pollutant Information: SABINE PASS LNG TERMINAL - Combined Cycle Refrigeration Compressor Turbines (8)

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	2.0800
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	0.6600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	water injection
Emission Limit 1:	22.9400
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	43.6000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	Good combustion/operating practices and fueled by natural gas - use GE LM2500+G4 turbines
Emission Limit 1:	4872107.0000
Emission Limit 1 Unit:	TONS/YEAR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM FROM THE FACILITYWIDE

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Simple Cycle Generation Turbines (2)
Primary Fuel:	Natural Gas

Pollutant Information: SABINE PASS LNG TERMINAL - Simple Cycle Generation Turbines (2)

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	2.0800
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	0.6600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	water injection
Emission Limit 1:	28.6800
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Good combustion practices and fueled by natural gas
Emission Limit 1:	17.4600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	Good combustion/operating practices and fueled by natural gas - use GE LM2500+G4 turbines
Emission Limit 1:	4872107.0000
Emission Limit 1 Unit:	TONS/YR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM FROM THE FACILITYWIDE

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Acid Gas Vents (4)
Primary Fuel:	

Pollutant Information: SABINE PASS LNG TERMINAL - Acid Gas Vents (4)

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	
Emission Limit 1:	39.2900
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	No additional control
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Marine Flare
Primary Fuel:	natural gas

Pollutant Information: SABINE PASS LNG TERMINAL - Marine Flare

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+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	14.9700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	185.1600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM
+Pollutant Name	Carbon Monoxide
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	705.4900
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	10.8300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	2909.0000
Emission Limit 1 Unit:	TONS/YR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Wet/Dry Gas Flares (4)
Primary Fuel:	natural gas

Pollutant Information: SABINE PASS LNG TERMINAL - Wet/Dry Gas Flares (4)

+Pollutant Name	Particulate matter, total (TPM)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	0.0300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Monoxide
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	0.1100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	proper plant operations and maintain the presence of the flame when the gas is routed to the flare
Emission Limit 1:	133.0000
Emission Limit 1 Unit:	TONS/YR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM

Process Information: SABINE PASS LNG TERMINAL

+Process Name:	Fugitive Emissions
Primary Fuel:	

Pollutant Information: SABINE PASS LNG TERMINAL - Fugitive Emissions

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+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Mechanical seals or equivalent for pumps and compressors that serve VOC with vapor pressure of 1.5 psia and above
Emission Limit 1:	5.0300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY MAXIMUM

+Pollutant Name	Carbon Dioxide Equivalent (CO2e)
+Control Method Description:	conduct a leak detection and repair (LDAR) program
Emission Limit 1:	89629.0000
Emission Limit 1 Unit:	TONS/YR
Emission Limit 1 Avg. Time/Condition:	ANNUAL MAXIMUM

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
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Facility Information: CUNNINGHAM POWER PLANT

RBLC ID:	NM-0051
+Corporate/Company Name:	SOUTHWESTERN PUBLIC SERVICE CO.
+Facility Name:	CUNNINGHAM POWER PLANT
Facility County:	LEA
Facility State:	NM
Facility ZIP Code:	88241-1650
EPA Region:	6
+SIC Code:	4911
Permit Issuance Date:	05/02/2011 ACT
Date determination entered in RBLC:	08/02/2011

Process Information: CUNNINGHAM POWER PLANT

+Process Name:	Normal Mode (without Power Augmentation)
Primary Fuel:	natural gas

Pollutant Information: CUNNINGHAM POWER PLANT - Normal Mode (without Power Augmentation)

+Pollutant Name	Nitrogen Dioxide (NO2)
+Control Method Description:	Dry Low NOx Burners Type K & Good Combustion Practice
Emission Limit 1:	21.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	HOUR

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Good Combustion Practices as defined in the permit.
Emission Limit 1:	77.2000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	Good Combustion Practices as described in the permit.
Emission Limit 1:	5.4000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

+Pollutant Name	Sulfur Dioxide (SO2)

+Control Method Description:	5.25 gr/100 SCF total sulfur limit in fuel.
Emission Limit 1:	22.1000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

Process Information: CUNNINGHAM POWER PLANT

+Process Name:	Power Augmentation
Primary Fuel:	natural gas

Pollutant Information: CUNNINGHAM POWER PLANT - Power Augmentation

+Pollutant Name	Nitrogen Dioxide (NO2)
+Control Method Description:	Dry Low NOx burners, Type K. Good Combustion Practices as defined in the permit.
Emission Limit 1:	30.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	HOURLY

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Good combustion practices as defined in the permit.
Emission Limit 1:	138.9000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	Good combustion practices as defined in the permit.
Emission Limit 1:	5.4000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	5.25 gr/scf total sulfur in fuel
Emission Limit 1:	22.1000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	HOURLY

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: PSEG FOSSIL LLC KEARNY GENERATING STATION

RBLC ID:	NJ-0076
+Corporate/Company Name:	PSEG FOSSIL LLC
+Facility Name:	PSEG FOSSIL LLC KEARNY GENERATING STATION
Facility County:	HUDSON
Facility State:	NJ
Facility ZIP Code:	07032
EPA Region:	2
+SIC Code:	4911
Permit Issuance Date:	10/27/2010 ACT
Date determination entered in RBLC:	08/08/2011

Process Information: PSEG FOSSIL LLC KEARNY GENERATING STATION

+Process Name:	SIMPLE CYCLE TURBINE
Primary Fuel:	Natural Gas

Pollutant Information: PSEG FOSSIL LLC KEARNY GENERATING STATION - SIMPLE CYCLE TURBINE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Oxidation Catalyst, Good combustion practices
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMVD@15% O2
Emission Limit 1 Avg. Time/Condition:	3-HR ROLLING AVERAGE BASED ON 1-HR BLOCK

+Pollutant Name	Particulate matter, filterable (FPM)
+Control Method Description:	Good combustion practice, Use of Clean Burning Fuel: Natural gas
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	AVERAGE OF THREE TESTS

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)

+Control Method Description:	Good combustion practice, Use of Clean Burning Fuel: Natural gas
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	AVERAGE OF THREE TESTS

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR and Use of Clean Burning Fuel: Natural gas
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMVD@15%O2
Emission Limit 1 Avg. Time/Condition:	3-HR ROLLING AVERAGE BASED ON 1-HR BLOCK

+Pollutant Name	Particulate matter, total < 2.5 µ (TPM2.5)
+Control Method Description:	Good combustion practice, Use of Clean Burning Fuel: Natural gas
Emission Limit 1:	6.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	AVERGE OF THREE TESTS

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation Catalyst and good combustion practices, use of natural gas.
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPMVD@15% O2
Emission Limit 1 Avg. Time/Condition:	AVERAGE OF THREE TESTS

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: HOWARD DOWN STATION

RBLC ID:	NJ-0077
+Corporate/Company Name:	VINELAND MUNICIPAL ELECTRIC UTILITY (VMEU)
+Facility Name:	HOWARD DOWN STATION
Facility County:	CUMBERLAND
Facility State:	NJ
Facility ZIP Code:	08360
EPA Region:	2
+SIC Code:	4911

Permit Issuance Date:	09/16/2010 ACT
Date determination entered in RBLC:	08/23/2011

Process Information: HOWARD DOWN STATION

+Process Name:	SIMPLE CYCLE (NO WASTE HEAT RECOVERY)(>25 MW)
Primary Fuel:	NATURAL GAS

Pollutant Information: HOWARD DOWN STATION - SIMPLE CYCLE (NO WASTE HEAT RECOVERY)(>25 MW)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	THE TURBINE WILL UTILIZE WATER INJECTION AND SELECTIVE CATALYTIC REDUCTION (SCR) TO CONTROL NOX EMISSION AND USE CLEAN FUELS NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL TO MINIMIZE NOX EMISSIONS
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMVD@15%O2
Emission Limit 1 Avg. Time/Condition:	3HR ROLLING AVERAGE BASED ON 1-HR BLOCK
+Pollutant Name	Carbon Monoxide
+Control Method Description:	THE TURBINE WILL UTILIZE A CATALYTIC OXIDIZER TO CONTROL CO EMISSION, IN ADDITION TO USING CLEAN BURNING FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH 15 PPM SULFUR BY WEIGHT
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMVD@15%O2
Emission Limit 1 Avg. Time/Condition:	3HR ROLLING AVERAGE BASED ON 1-HR BLOCK
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	USE OF CLEAN BURNING FUELS; NATURAL GAS AS PRIMARY FUEL AND ULTRA LOW SULFUR DISTILLATE OIL WITH 15 PPMSULFUR BY WEIGHT AS BACKUP FUEL
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	AVERAGE OF THREE TESTS
+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	USE OF CLEAN BURNING FUELS; NATURAL GAS AS PRIMARY FUEL AND ULTRA LOW SULFUR DISTILLATE OIL WITH 15 PPMSULFUR BY WEIGHT AS BACKUP FUEL
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg. Time/Condition:	AVERAGE OF THREE TESTS

Previous Page

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Report Date: 04/24/2013 Control Technology Determinations (Freeform)

Facility Information: DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P

RBLC ID:	GA-0139
+Corporate/Company Name:	SOUTHERN POWER COMPANY
+Facility Name:	DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P
Facility County:	JACKSON
Facility State:	GA
Facility ZIP Code:	30565
EPA Region:	4
+SIC Code:	4911
Permit Issuance Date:	05/14/2010 ACT
Date determination entered in RBLC:	09/09/2010

Process Information: DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P

+Process Name:	SIMPLE CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT
Primary Fuel:	NATURAL GASE

Pollutant Information: DAHLBERG COMBUSDTION TURBINE ELECTRIC GENERATING FACILITY (P - SIMPLE CYCLE COMBUSTION TURBINE - ELECTRIC GENERATING PLANT

+Pollutant Name	Carbon Monoxide
+Control Method Description:	GOOD COMBUSTION PRACTICES
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPM@15%02
Emission Limit 1 Avg. Time/Condition:	3-HOUR AVERAGE/CONDITION 3.3.24

+Pollutant Name	Nitrogen Oxides (NOx)

+Control Method Description:	DRY LOW NOX BURNERS (FIRING NATURAL GAS). WATER INJECTION (FIRING FUEL OIL).
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPM@15%02
Emission Limit 1 Avg. Time/Condition:	3 HOUR AVERAGE/CONDITION 3.3.23

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	DRY LOW NOx BURNERS (FIRING NATURAL GAS), WATER INJECTION (FIRING FUEL OIL).
Emission Limit 1:	297.0000
Emission Limit 1 Unit:	T/YR
Emission Limit 1 Avg. Time/Condition:	12 CONSECUTIVE MONTH AVERAGE /CONDITION

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	GOOD COMBUSTION PRACTICES PIPELINE QUALITY NATURAL GAS, ULTRA LOW SULFUR DISTILLATE FUEL
Emission Limit 1:	9.1000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	3 HOUR AVERAGE/CONDITION 3.3.23

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	GOOD COMBUSTION PRACTICES
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPM@15%02
Emission Limit 1 Avg. Time/Condition:	3 HOUR AVERAGE/CONTITION 3.3.24

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
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Facility Information: EL CAJON ENERGY LLC

RBLC ID:	CA-1174
+Corporate/Company Name:	EL CAJON ENERGY LLC
+Facility Name:	EL CAJON ENERGY LLC
Facility County:	SAN DIEGO
Facility State:	CA
Facility ZIP Code:	92020
EPA Region:	9
+SIC Code:	519

Permit Issuance Date:	12/11/2009 ACT
Date determination entered in RBLC:	09/20/2010

Process Information: EL CAJON ENERGY LLC

+Process Name:	Gas turbine simple cycle
Primary Fuel:	Natural gas

Pollutant Information: EL CAJON ENERGY LLC - Gas turbine simple cycle

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	Water injection and SCR
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMV
Emission Limit 1 Avg. Time/Condition:	1 HOUR

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxydation catalyst
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMV
Emission Limit 1 Avg. Time/Condition:	1 HOUR

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
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Facility Information: DAYTON POWER & LIGHT ENERGY LLC

RBLC ID:	OH-0333
+Corporate/Company Name:	DAYTON POWER & LIGHT COMPANY
+Facility Name:	DAYTON POWER & LIGHT ENERGY LLC
Facility County:	MONTGOMERY
Facility State:	OH
Facility ZIP Code:	45439
EPA Region:	5
+SIC Code:	4911
Permit Issuance Date:	12/03/2009 ACT
Date determination entered in RBLC:	05/13/2010

Process Information: DAYTON POWER & LIGHT ENERGY LLC

+Process Name:	Turbines (4), simple cycle, natural gas
Primary Fuel:	NATURAL GAS

Pollutant Information: DAYTON POWER & LIGHT ENERGY LLC - Turbines (4), simple cycle, natural gas

+Pollutant Name	Particulate matter, filterable (FPM)
+Control Method Description:	
Emission Limit 1:	0.0130
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	ACTUAL HEAT INPUT
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	
Emission Limit 1:	0.0130
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	ACTUAL HEAT INPUT
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	dry low NOx burners
Emission Limit 1:	161.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	EACH TURBINE
+Pollutant Name	Carbon Monoxide
+Control Method Description:	efficient combution technology
Emission Limit 1:	301.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	EACH TURBINE
+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	Fuel oil with no more than 0.05% by weight sulfur
Emission Limit 1:	0.0026
Emission Limit 1 Unit:	LB/MMBTU

Emission Limit 1 Avg. Time/Condition: ACTUAL HEAT INPUT

+Pollutant Name: Volatile Organic Compounds (VOC)
+Control Method Description:
Emission Limit 1: 4.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg. Time/Condition: EACH TURBINE

+Pollutant Name: Visible Emissions (VE)
+Control Method Description: Only clean fuels
Emission Limit 1: 20.0000
Emission Limit 1 Unit: % OPACITY
Emission Limit 1 Avg. Time/Condition: AS A 6-MIN AVERAGE, EXCEPT PER RULE

+Pollutant Name: Formaldehyde
+Control Method Description:
Emission Limit 1: 0.0006
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition: ACTUAL HEAT INPUT

Process Information: DAYTON POWER & LIGHT ENERGY LLC

+Process Name: Turbines (4), simple cycle, fuel oil #2
Primary Fuel: Fuel oil #2

Pollutant Information: DAYTON POWER & LIGHT ENERGY LLC - Turbines (4), simple cycle, fuel oil #2

+Pollutant Name: Particulate matter, filterable (FPM)
+Control Method Description:
Emission Limit 1: 0.0260
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition: ACTUAL HEAT INPUT

+Pollutant Name: Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:
Emission Limit 1: 0.0260

Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: ACTUAL HEAT INPUT

+Pollutant Name Nitrogen Oxides (NOx)
+Control Method
Description: Water injection
Emission Limit 1: 269.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: EACH TURBINE

+Pollutant Name Carbon Monoxide
+Control Method
Description: efficient combustion technology
Emission Limit 1: 800.0000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: EACH TURBINE

+Pollutant Name Sulfur Dioxide (SO2)
+Control Method
Description: Fuel oil with no more than 0.05% by weight sulfur
Emission Limit 1: 0.0550
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: ACTUAL HEAT INPUT

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
+Control Method
Description: Low sulfur fuel oil
Emission Limit 1: 0.0054
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg.
Time/Condition: ACTUAL HEAT INPUT

+Pollutant Name Volatile Organic Compounds (VOC)
+Control Method
Description:
Emission Limit 1: 5.5000
Emission Limit 1 Unit: LB/H
Emission Limit 1 Avg.
Time/Condition: EACH TURBINE

+Pollutant Name Formaldehyde
+Control Method
Description:
Emission Limit 1: 0.0003

Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	ACTUAL HEAT INPUT

+Pollutant Name	Visible Emissions (VE)
+Control Method Description:	Only clean fuels
Emission Limit 1:	20.0000
Emission Limit 1 Unit:	% OPACITY
Emission Limit 1 Avg. Time/Condition:	AS A 6-MIN AVERAGE, EXCEPT PER RULE

Previous Page

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Facility Information: BAYONNE ENERGY CENTER

RBLC ID:	NJ-0075
+Corporate/Company Name:	BAYONNE ENERGY CENTER, LLC
+Facility Name:	BAYONNE ENERGY CENTER
Facility County:	HUDSON
Facility State:	NJ
Facility ZIP Code:	07002
EPA Region:	2
+SIC Code:	4911
Permit Issuance Date:	09/24/2009 ACT
Date determination entered in RBLC:	03/01/2011

Process Information: BAYONNE ENERGY CENTER

+Process Name:	COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8
Primary Fuel:	NATURAL GAS

Pollutant Information: BAYONNE ENERGY CENTER - COMBUSTION TURBINES, SIMPLE CYCLE , ROLLS ROYCE, 8

+Pollutant Name	Carbon Monoxide
+Control Method Description:	CO OXIDATION CATALYST AND CLEAN BURNING FUELS
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	PPMVD@15%O2

Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SELECTIVE CATALYTIC REDUCTION SYSTEM (SCR) AND WET LOW-EMISSION (WLE) COMBUSTORS SUBJECT TO LAER
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMVD@15%O2
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM.
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM.
Emission Limit 1:	5.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	CO OXIDATION CATALYST AND POLLUTION PREVENTION, BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM Subject to LAER
Emission Limit 1:	1.9300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	BURNING CLEAN FUELS, NATURAL GAS AND ULTRA LOW SULFUR DISTILLATE OIL WITH SULFUR CONTENT OF 15 PPM.
Emission Limit 1:	1.2200
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	

Previous Page

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Facility Information: GREENLAND ENERGY CENTER

RBLC ID:	FL-0319
+Corporate/Company Name:	JACKSONVILLE ELECTRIC AUTHORITY (JEA)
+Facility Name:	GREENLAND ENERGY CENTER
Facility County:	DUVAL
Facility State:	FL
Facility ZIP Code:	32258
EPA Region:	4
+SIC Code:	4911
Permit Issuance Date:	03/10/2009 ACT
Date determination entered in RBLC:	09/23/2010

Process Information: GREENLAND ENERGY CENTER

+Process Name:	190 MW Combustion Turbine
Primary Fuel:	ULSO

Pollutant Information: GREENLAND ENERGY CENTER - 190 MW Combustion Turbine

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	DLN Combustion System when firing natural gas and water injection system when firing fuel oil.
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPMVD @15% O2 (GAS)
Emission Limit 1 Avg. Time/Condition:	24-HR BLOCK/CEMS

+Pollutant Name	Carbon Monoxide
+Control Method Description:	Good Combustion
Emission Limit 1:	4.1000
Emission Limit 1 Unit:	PPMVD @ 15% O2 (GAS)
Emission Limit 1 Avg. Time/Condition:	24-HR BLOCK/CEMS

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	Fuel/material sulfur limitation
Emission Limit 1:	2.0000

Emission Limit 1 Unit:	GR S/100 SCF GAS
Emission Limit 1 Avg. Time/Condition:	RECORD KEEPING

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
+Control Method Description:	
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	GR S/100 SCF
Emission Limit 1 Avg. Time/Condition:	RECORD KEEPING

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	Use of low ash, low sulfur fuels,
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	OPACITY
Emission Limit 1 Avg. Time/Condition:	6 MINUTES BLOCK/VE TEST

+Pollutant Name	Visible Emissions (VE)
+Control Method Description:	Low sulfur fuels and NOx control
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	OPACITY
Emission Limit 1 Avg. Time/Condition:	

Previous Page

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Facility Information: BOSQUE COUNTY POWER PLANT

RBLC ID:	TX-0540
+Corporate/Company Name:	BOSQUE POWER COMPANY LLC
+Facility Name:	BOSQUE COUNTY POWER PLANT
Facility County:	BOSQUE
Facility State:	TX
Facility ZIP Code:	76644
EPA Region:	6
+SIC Code:	4911
Permit Issuance Date:	02/27/2009 ACT
Date determination entered in RBLC:	11/06/2009

Process Information: BOSQUE COUNTY POWER PLANT

+Process Name:	ELECTRICAL GENERATION
Primary Fuel:	NATURAL GAS

Pollutant Information: BOSQUE COUNTY POWER PLANT - ELECTRICAL GENERATION

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	BACT IS 9 PPMVD AT 15% O2 THROUGH THE USE OF DRY LOW-NOX (DLN) COMBUSTERS WHEN THE COMBUSTION TURBINE IS OPERATING IN THE SIMPLE CYCLE MODE.
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	24-HOUR 15% O2
+Pollutant Name	Ammonia (NH3)
+Control Method Description:	CAREFUL CONTROL OF AMMONIA INJECTION AND OPERATING PARAMETERS WILL BE MAINTAINED TO CONTROL AMMONIA SLIP IN THE HRSG EXHAUST STREAM TO LEVELS NOT EXCEEDING 10 PPMVD ON A 3-HOUR ROLLING BASIS AND 7 PPMVD ON AN ANNUAL AVERAGE.
Emission Limit 1:	7.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	ANNUALLY
+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	BACT IS THE USE OF PIPELINE-QUALITY NATURAL GAS AND THE APPLICATION OF GOOD COMBUSTION CONTROLS. WITH THIS METHOD OF CONTROL, PM/PM10 EMISSIONS SHOULD NOT EXCEED 0.01 LB/MMBTU FOR A 3-HOUR ROLLING PERIOD.
Emission Limit 1:	0.0100
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3 HR ROLLING PERIOD
+Pollutant Name	Carbon Monoxide
+Control Method Description:	BACT IS THE USE OF GOOD COMBUSTION PRACTICES TO MINIMIZE THE PRODUCTS OF INCOMPLETE COMBUSTION AND ACHIEVE 9 PPMVD AT 15% O2 IN THE TURBINE EXHAUST OVER A ROLLING 3-HOUR PERIOD.
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	3 HOUR @ 15% O2

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	BACT IS THE USE OF GOOD COMBUSTION PRACTICES TO MINIMIZE THE PRODUCTS OF INCOMPLETE COMBUSTION OF THE NATURAL GAS TO ACHIEVE LESS THAN 4 PPMV OVER A ROLLING 3-HOUR PERIOD.
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPMVD
Emission Limit 1 Avg. Time/Condition:	3 HOUR

Previous Page

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Report Date: 04/24/2013 Control Technology Determinations (Freeform)

Facility Information: SHADY HILLS GENERATING STATION

RBLC ID:	FL-0310
+Corporate/Company Name:	SHADY HILLS POWER COMPANY
+Facility Name:	SHADY HILLS GENERATING STATION
Facility County:	PASCO
Facility State:	FL
Facility ZIP Code:	06927
EPA Region:	4
+SIC Code:	4911
Permit Issuance Date:	01/12/2009 ACT
Date determination entered in RBLC:	07/29/2009

Process Information: SHADY HILLS GENERATING STATION

+Process Name:	TWO SIMPLE CYCLE COMBUSTION TURBINE - MODEL 7FA
Primary Fuel:	NATURAL GAS

Pollutant Information: SHADY HILLS GENERATING STATION - TWO SIMPLE CYCLE COMBUSTION TURBINE - MODEL 7FA

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	FIRING NATURAL GAS AND USING DLN 2.6 COMBUSTORS TO MINIMIZE NOX EMISSSIONS.
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg. Time/Condition:	24-HR BLOCK AVG BY CEMS

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	
Emission Limit 1:	10.0000
Emission Limit 1 Unit:	% OPACITY
Emission Limit 1 Avg. Time/Condition:	6-MINUTE BLOCK BY EPA METHOD 9

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	FIRING OF NATURAL GAS WITH A MAXIMUM S CONTENT AT 2GR/100 SCF AND ULTRA LOW SULFUR DIESEL FUEL OIL WITH A MAXIMUM S CONTENT AT 0.0015%, BY WEIGHT.
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	GR S/100 SCF NG
Emission Limit 1 Avg. Time/Condition:	NA/RECORDING COMPLIANCE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	
Emission Limit 1:	6.5000
Emission Limit 1 Unit:	PPMVD @ 15% O2 NG
Emission Limit 1 Avg. Time/Condition:	

Process Information: SHADY HILLS GENERATING STATION

+Process Name:	2.5 MW EMERGENCY GENERATOR
Primary Fuel:	ULTRA LOW S OIL

Pollutant Information: SHADY HILLS GENERATING STATION - 2.5 MW EMERGENCY GENERATOR

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	FIRING ULSO WITH A MAXIMUM SULFUR CONTENT OF 0.0015% BY WEIGHT AND A MAXIMUM HOURS OF OPERATION OF 500 HOUR/YR.
Emission Limit 1:	0.4000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	NA /RECORDKEEPING

+Pollutant Name	Particulate matter, total < 10 µ (TPM10)
+Control Method Description:	FIRING ULSO WITH A MAXIMUM SULFUR CONTENT OF 0.0015% BY WEIGHT AND A MAXIMUM HOURS OF OPERATION OF 500 HOUR/YR.

Emission Limit 1:	0.4000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	NA /RECORDKEEPING

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	FIRING ULTRA LOW SULFUR OIL WITH A MAXIMUM HOURS OF OPERATION OF 500 HRS/YR.
Emission Limit 1:	0.0015
Emission Limit 1 Unit:	% S BY WT
Emission Limit 1 Avg. Time/Condition:	NA/RECORDKEEPING

+Pollutant Name	Hydrocarbons, Total
+Control Method Description:	FIRING OF ULTRA LOW SULFUR OIL (ULSO).
Emission Limit 1:	1.0000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	PURCHASE MODEL IS AT LEAST AS STRINGENT AS THE BACT VALUES, UNDER EPA CERTIFICATION.
Emission Limit 1:	6.9000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	3 ONE HOUR TEST

+Pollutant Name	Carbon Monoxide
+Control Method Description:	PURCHASED MODEL IS AT LEAST AS STRINGENT AS THE BACT VALUES UNDER EPA'S CERTIFICATION.
Emission Limit 1:	8.5000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	3 ONE HOUR TEST RUNS BY EPA METHOD 10

Previous Page

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Facility Information: ORANGE GROVE PROJECT

RBLC ID:	CA-1176
+Corporate/Company Name:	

+Facility Name:	ORANGE GROVE PROJECT
Facility County:	SAN DIEGO
Facility State:	CA
Facility ZIP Code:	92059
EPA Region:	9
+SIC Code:	491
Permit Issuance Date:	12/04/2008 ACT
Date determination entered in RBLC:	09/21/2010

Process Information: ORANGE GROVE PROJECT

+Process Name:	Gas turbine simple cycle
Primary Fuel:	Natural gas

Pollutant Information: ORANGE GROVE PROJECT - Gas turbine simple cycle

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR water injection
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	1 HOUR
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	Oxidation catalyst
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	1 HOUR

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
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Facility Information: CPV ST CHARLES

RBLC ID:	MD-0040
+Corporate/Company Name:	COMPETITIVE POWER VENTURES, INC./CPV MARYLAND, LLC
+Facility Name:	CPV ST CHARLES
Facility County:	CHARLES
Facility State:	MD

Facility ZIP Code:
EPA Region: 3
+SIC Code: 1731
Permit Issuance Date: 11/12/2008 ACT
Date determination entered in RBLC: 01/12/2009

Process Information: CPV ST CHARLES

+Process Name: COMBUSTION TURBINES (2)
Primary Fuel: NATURAL GAS

Pollutant Information: CPV ST CHARLES - COMBUSTION TURBINES (2)

+Pollutant Name Particulate Matter (PM)
+Control Method Description:
Emission Limit 1: 0.0120
Emission Limit 1 Unit: LB/MMBTU @ 15% O2
Emission Limit 1 Avg. Time/Condition: 3-HR AVERAGE

+Pollutant Name Carbon Monoxide
+Control Method Description: OXIDATION CATALYST
Emission Limit 1: 2.0000
Emission Limit 1 Unit: PPMVD @ 15% O2
Emission Limit 1 Avg. Time/Condition: 3-HR AVERAGE

+Pollutant Name Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:
Emission Limit 1: 0.0120
Emission Limit 1 Unit: LB/MMBTU @ 15% O2
Emission Limit 1 Avg. Time/Condition: 3-HR AVERAGE

+Pollutant Name Sulfuric Acid (mist, vapors, etc)
+Control Method Description:
Emission Limit 1: 0.0030
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition: 3-HR AVERAGE

+Pollutant Name Nitrogen Oxides (NOx)

+Control Method Description:	DRY LOW NOX BURNER AND SCR
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HR ROLLING AVERAGE

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	OXIDATION CATALYST
Emission Limit 1:	1.0000
Emission Limit 1 Unit:	PPMVD @ 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE, W/O DUCT FIRING

+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	
Emission Limit 1:	0.0120
Emission Limit 1 Unit:	LB/MMBTU @ 15% O2
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE

Process Information: CPV ST CHARLES

+Process Name:	BOILER
Primary Fuel:	NATURAL GAS

Pollutant Information: CPV ST CHARLES - BOILER

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE

+Pollutant Name	Carbon Monoxide
+Control Method Description:	
Emission Limit 1:	0.0200
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)

+Control Method Description:	
Emission Limit 1:	0.0001
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	LOW NOX WITH FGR
Emission Limit 1:	0.0110
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	
Emission Limit 1:	0.0020
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE
+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	
Emission Limit 1:	0.0050
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	3-HR AVERAGE

Process Information: CPV ST CHARLES

+Process Name:	INTERNAL COMBUSTION ENGINE - EMERGENCY FIRE WATER PUMP
Primary Fuel:	DIESEL

Pollutant Information: CPV ST CHARLES - INTERNAL COMBUSTION ENGINE - EMERGENCY FIRE WATER PUMP

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	GR-HP-H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Carbon Monoxide
+Control Method Description:	
Emission Limit 1:	2.6000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	
Emission Limit 1:	3.0000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	
+Pollutant Name	Methane
+Control Method Description:	
Emission Limit 1:	3.0000

Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

Process Information: CPV ST CHARLES

+Process Name:	INTERNAL COMBUSTION ENGINE - EMERGENCY GENERATOR
Primary Fuel:	DIESEL

Pollutant Information: CPV ST CHARLES - INTERNAL COMBUSTION ENGINE - EMERGENCY GENERATOR

+Pollutant Name	Carbon Monoxide
+Control Method Description:	
Emission Limit 1:	2.6000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
+Control Method Description:	
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	

Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	
Emission Limit 1:	4.8000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	
Emission Limit 1:	4.8000
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	
Emission Limit 1:	0.1500
Emission Limit 1 Unit:	G/HP-H
Emission Limit 1 Avg. Time/Condition:	

Process Information: CPV ST CHARLES

+Process Name:	HEATER
Primary Fuel:	NATURAL GAS

Pollutant Information: CPV ST CHARLES - HEATER

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	
Emission Limit 1:	0.0070
Emission Limit 1 Unit:	LB/MMBTU
Emission Limit 1 Avg. Time/Condition:	

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	

Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition:

+Pollutant Name Carbon Monoxide
+Control Method Description:
Emission Limit 1: 0.0800
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition:

+Pollutant Name Nitrogen Oxides (NOx)
+Control Method Description:
Emission Limit 1: 0.1000
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition:

+Pollutant Name Sulfur Dioxide (SO2)
+Control Method Description:
Emission Limit 1: 0
Emission Limit 1 Unit:
Emission Limit 1 Avg. Time/Condition: SEE NOTE

+Pollutant Name Volatile Organic Compounds (VOC)
+Control Method Description:
Emission Limit 1: 0.0050
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition:

+Pollutant Name Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:
Emission Limit 1: 0.0070
Emission Limit 1 Unit: LB/MMBTU
Emission Limit 1 Avg. Time/Condition:

Process Information: CPV ST CHARLES

+Process Name:	COOLING TOWER
Primary Fuel:	

Pollutant Information: CPV ST CHARLES - COOLING TOWER

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE
+Pollutant Name	Particulate matter, filterable < 2.5 µ (FPM2.5)
+Control Method Description:	
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: ESCONDIDO ENERGY CENTER LLC

RBLC ID:	CA-1175
+Corporate/Company Name:	
+Facility Name:	ESCONDIDO ENERGY CENTER LLC
Facility County:	SAN DIEGO
Facility State:	CA
Facility ZIP Code:	92029
EPA Region:	9
+SIC Code:	491
Permit Issuance Date:	07/02/2008 ACT

Date determination entered in RBLC:	09/21/2010

Process Information: ESCONDIDO ENERGY CENTER LLC

+Process Name:	Gas turbine simple cycle
Primary Fuel:	Natural gas

Pollutant Information: ESCONDIDO ENERGY CENTER LLC - Gas turbine simple cycle

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	SCR water injection
Emission Limit 1:	2.5000
Emission Limit 1 Unit:	PPMV@15% OXYGEN
Emission Limit 1 Avg. Time/Condition:	1 HOUR
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	oxydation catalyst
Emission Limit 1:	2.0000
Emission Limit 1 Unit:	PPMV@15% OXYGEN
Emission Limit 1 Avg. Time/Condition:	1 HOUR

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: GREAT RIVER ENERGY - ELK RIVER STATION

RBLC ID:	MN-0075
+Corporate/Company Name:	GREAT RIVER ENERGY
+Facility Name:	GREAT RIVER ENERGY - ELK RIVER STATION
Facility County:	SHERBURNE
Facility State:	MN
Facility ZIP Code:	55330
EPA Region:	5
+SIC Code:	4911
Permit Issuance Date:	07/01/2008 ACT
Date determination entered in RBLC:	12/01/2008

Process Information: GREAT RIVER ENERGY - ELK RIVER STATION

+Process Name:	COMBUSTION TURBINE GENERATOR
Primary Fuel:	NATURAL GAS

Pollutant Information: GREAT RIVER ENERGY - ELK RIVER STATION - COMBUSTION TURBINE GENERATOR

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	FUEL LIMITED TO NATURAL GAS AND ULTRA-LOW SULFUR FUEL OIL
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	DRY LOW-NOX COMBUSTION WHEN COMBUSTING NATURAL GAS
Emission Limit 1:	9.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	4 HR ROLLING AVG, NG, >/= 60% LOAD
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	WATER INJECTION WHEN COMBUSTING FUEL OIL
Emission Limit 1:	42.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	4 HR ROLLING AVG, FO, >/= 70% LOAD
+Pollutant Name	Carbon Monoxide
+Control Method Description:	GOOD COMBUSTION PRACTICES
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	4 HR ROLLING AVG, NG, >/= 70% LOAD
+Pollutant Name	Carbon Monoxide
+Control Method Description:	GOOD COMBUSTION CONTROL
Emission Limit 1:	150.0000
Emission Limit 1 Unit:	PPM

Emission Limit 1 Avg. Time/Condition:	4 HR ROLLING AVG, NG,

+Pollutant Name	Carbon Monoxide
+Control Method Description:	GOOD COMBUSTION CONTROL
Emission Limit 1:	250.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	4 HR ROLLING AVG, FO, 60% - 70% LOAD

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	FUEL LIMITED TO NATURAL GAS AND ULTRA-LOW SULFUR FUEL OIL
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	FUEL LIMITED TO NATURAL GAS AND ULTRA-LOW SULFUR FUEL OIL
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	SEE NOTE

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: WESTERN FARMERS ELECTRIC ANADARKO

RBLC ID:	OK-0127
+Corporate/Company Name:	WESTERN FARMERS ELECTRIC COOPERATIVE
+Facility Name:	WESTERN FARMERS ELECTRIC ANADARKO
Facility County:	CADDO
Facility State:	OK
Facility ZIP Code:	73005
EPA Region:	6
+SIC Code:	4911
Permit Issuance Date:	06/13/2008 ACT
Date determination entered in RBLC:	12/31/2008

Process Information: WESTERN FARMERS ELECTRIC ANADARKO

+Process Name:	COMBUSTION TURBINE PEAKING UNIT(S)
Primary Fuel:	NATURAL GAS

Pollutant Information: WESTERN FARMERS ELECTRIC ANADARKO - COMBUSTION TURBINE PEAKING UNIT(S)

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	WATER INJECTION
Emission Limit 1:	25.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	ADJUSTED 15% O2
+Pollutant Name	Carbon Monoxide
+Control Method Description:	NO CONTROLS FEASIBLE.
Emission Limit 1:	63.0000
Emission Limit 1 Unit:	PPM
Emission Limit 1 Avg. Time/Condition:	CORRECTED TO 15% O2
+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	NO CONTROLS FEASIBLE.
Emission Limit 1:	4.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	2,500 HR/YEAR

Previous Page

NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Facility Information: ARSENAL HILL POWER PLANT

RBLC ID:	LA-0224
+Corporate/Company Name:	SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)
+Facility Name:	ARSENAL HILL POWER PLANT
Facility County:	CADDO
Facility State:	LA

Facility ZIP Code:	71101
EPA Region:	6
+SIC Code:	4911
Permit Issuance Date:	03/20/2008 ACT
Date determination entered in RBLC:	04/18/2008

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	TWO COMBINED CYCLE GAS TURBINES
Primary Fuel:	NATURAL GAS

Pollutant Information: ARSENAL HILL POWER PLANT - TWO COMBINED CYCLE GAS TURBINES

+Pollutant Name	Particulate Matter (PM)
+Control Method Description:	GOOD COMBUSTION DESIGN/ PROPER OPERATING PRACTICES/ PIPELINE QUALITY NATURAL GAS AS FUEL
Emission Limit 1:	24.2300
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	USE LOW-SULFUR PIPELINE-QUALITY NATURAL GAS AS FUEL
Emission Limit 1:	12.0600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Carbon Monoxide
+Control Method Description:	PROPER OPERATING PRACTICES
Emission Limit 1:	143.3100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	PROPER OPERATING PRACTICES
Emission Limit 1:	12.0600
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Sulfuric Acid (mist, vapors, etc)
+Control Method Description:	USE OF LOW-SULFUR PIPELINE QUALITY NATURAL GAS AS FUEL AND PROPER SCR DESIGN
Emission Limit 1:	1.8500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	LOW NOX TURBINES, DUCT BURNERS COMBINED WITH SCR
Emission Limit 1:	30.1500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	SCN-3 COLD STARTUP CTG-1 SCN-7 COLD STARTUP CTG-2
Primary Fuel:	NATURAL GAS

Pollutant Information: ARSENAL HILL POWER PLANT - SCN-3 COLD STARTUP CTG-1 SCN-7 COLD STARTUP CTG-2

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	400.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Carbon Monoxide
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	1508.1500
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	214.0700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	SCN-4 HOT STARTUP CTG-1 SCN-8 HOT STARTUP CTG-2
Primary Fuel:	NATURAL GAS

Pollutant Information: ARSENAL HILL POWER PLANT - SCN-4 HOT STARTUP CTG-1 SCN-8 HOT STARTUP CTG-2

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	400.0000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Carbon Monoxide
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	1575.8000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	214.0700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	SCN-5 SHUTDOWN CTG-1 / SCN-9 SHUTDOWN CTG-2
Primary Fuel:	NATURAL GAS

Pollutant Information: ARSENAL HILL POWER PLANT - SCN-5 SHUTDOWN CTG-1 / SCN-9 SHUTDOWN CTG-2

+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	400.0000
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Carbon Monoxide
+Control Method Description:	COMPLETE EVENTS AS QUICKLY AS POSSIBLE ACCORDING TO MANUFACTURE¿S RECOMMENDED PROCEDURES.
Emission Limit 1:	964.5700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	COOLING TOWER
Primary Fuel:	

Pollutant Information: ARSENAL HILL POWER PLANT - COOLING TOWER

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	USE OF MIST ELIMINATORS
Emission Limit 1:	1.4000
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Process Information: ARSENAL HILL POWER PLANT

+Process Name:	DFP DIESEL FIRE PUMP
Primary Fuel:	DIESEL

Pollutant Information: ARSENAL HILL POWER PLANT - DFP DIESEL FIRE PUMP

+Pollutant Name	Particulate matter, filterable < 10 µ (FPM10)
+Control Method Description:	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE
Emission Limit 1:	0.6800
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

+Pollutant Name	Sulfur Dioxide (SO2)
+Control Method Description:	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE
Emission Limit 1:	0.6400
Emission Limit 1 Unit:	LB/H

Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Nitrogen Oxides (NOx)
+Control Method Description:	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE
Emission Limit 1:	9.6100
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Carbon Monoxide
+Control Method Description:	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE
Emission Limit 1:	2.0700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX
+Pollutant Name	Volatile Organic Compounds (VOC)
+Control Method Description:	USE OF LOW-SULFUR FUELS, LIMITING OPERATING HOURS AND PROPER ENGINE MAINTENANCE
Emission Limit 1:	0.7700
Emission Limit 1 Unit:	LB/H
Emission Limit 1 Avg. Time/Condition:	MAX

Previous Page

Appendix C

Air Quality Impact Analysis Support Documentation

Protocol
Load Screening
Modeling Emissions Calculations
NAAQS and Increment

ATMOSPHERIC DYNAMICS, INC
Meteorological & Air Quality Modeling

January 24, 2013

Mr. Philip Allen
ODEQ, Air Quality Division
811 SW Sixth Avenue
Portland, OR 97204-1390

Re: Air Quality Modeling Protocol for the Perennial Wind Chaser Station

Dear Mr. Allen:

Attached is the Air Quality Modeling Protocol for the Perennial Power Holding, Inc. (PPH) proposed 412 MW gas fired simple cycle power plant called the Perennial Wind Chaser Station. The proposed project will be co-located next to the Hermiston Generating Plant in Hermiston Oregon. The proposed project will consist of four (4) General Electric LMS-100 natural gas fired turbines. Also associated with the project will be a mechanical draft cooling tower and a diesel fired fire pump. Based upon emissions of Greenhouse Gases (GHGs), the project is expected to be a major source under the Prevention of Significant Deterioration (PSD) rules and regulations. Based upon the ownership structure of the existing and proposed facilities, the Wind Chaser Station will also be considered as a major modification to the Hermiston Generating Plant under the New Source Review/Prevention of Significant Deterioration (NSR/PSD) rules (common ownership and control). However, the proposed project will not be under common control and will be wholly owned by and operated by PPH.

The air quality analysis will be conducted to demonstrate that impacts from NO_x, CO, PM10 and PM2.5 will comply with the National Ambient Air Quality Standards (NAAQS) and PSD Increments (Class I and Class II) for the applicable averaging periods. Additionally, the project will model the potential for impacts to the applicable Air Quality Related Values (AQRVs) for visibility and deposition. Table 1 summarizes the proposed analyses on a pollutant specific basis. The modeling will follow procedures as summarized by the Oregon Department of Environmental Quality (ODEQ), the United States Environmental Protection Agency (EPA) and Federal Land Managers (FLM) modeling guidelines. The protocol also was prepared based on conversations with Phillip Allen and Mark Bailey (ODEQ) and Rick Graw of the United States Forrest Service (USFS). Additional guidance procedures are summarized below: U.S. Environmental Protection Agency (USEPA) in its "*Guideline on Air Quality Models*" (including supplements), USEPA Memorandum *"Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard"* (March 2011), USEPA Memorandum *"Applicability of Appendix W Modeling Guidance for the 1-hour SO_2 National Ambient Air Quality Standard"* (August 2010), USEPA Memorandum *"Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS (March 2010),* California Air Pollution Control Officers Association (CAPCOA) *"Modeling Compliance of the Federal 1-Hour NO_2 NAAQS"*(Draft Release 2011), the Federal Land Managers' *"Air Quality Related Values Workgroup (FLAG) Phase I Report-Revised"* (October 2010), and the *"Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Recommendations"* (1998).

Table 1 **Air Quality Criteria**	NO_2	PM10	PM2.5	CO	SO_2
PSD Significant Impact Levels for Class I Areas	✓	✓	✓	✓	
Ambient Air Quality Standards	✓	✓	✓	✓	✓
Class I and Class II Visibility and Deposition	✓	✓	✓		
Impacts to Soils and Vegetation	✓	✓	✓	✓	
Class I and Class II Area Increment	✓	✓	✓		

Attached for your review is a description of the analytical approach that will be used to comply with ODEQ modeling requirements for the project. We look forward to working with you.

If you have any questions, please do not hesitate to call me at (831) 620-0481. Thank you for your attention in this matter.

Sincerely,

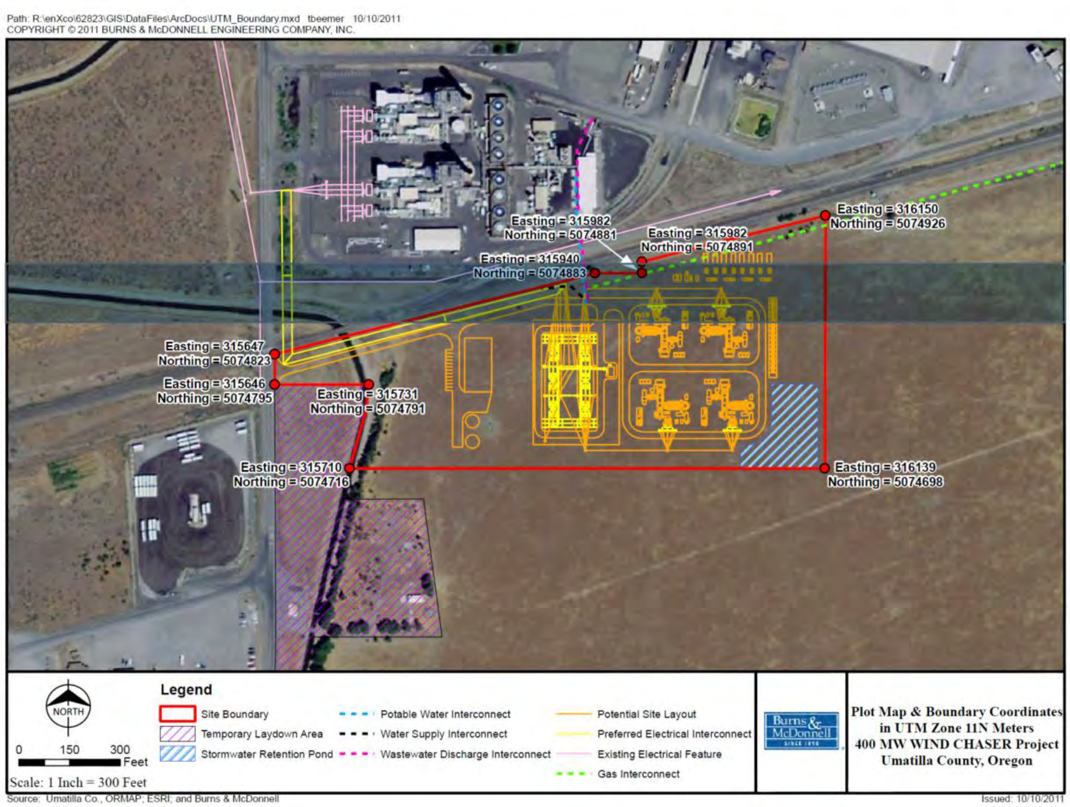
Atmospheric Dynamics, Inc.

Gregory S. Darvin
Senior Meteorologist
cc: Mark Fisher DEQ
Paul Neil RTP

INTRODUCTION AND FACILITY DESCRIPTION

Perennial proposes to construct and operate up to four General Electric LMS100 (or equivalent) natural gas fired turbines in open cycle, which will produce up to approximately 412 megawatts (MW) of electric power. There will be no fuel oil backup. The design and location of the proposed Perennial Wind Chaser Station (Station) would provide excellent load shaping of the irregular (volatile) wind generated electricity produced along the Columbia River, which should help to stabilize the electric power grid in the area and make the area more attractive for further renewables development. The project site is in the northwest quarter of Section 30, Township 4 North, Range 28 East in Umatilla County, Oregon (see Exhibit G for location maps). The Station would be accessed via Westland Road, which provides access to Interstates 82 and 84. The site is located approximately three (3) miles southwest of Hermiston, Oregon in Umatilla County. The UTM Zone 11 coordinates of the site are 315977 meters easting, 5074829 meters northing. Figure 1 presents the location of the proposed project.

Figure 1 Project Location



The Station will be sited in an area of slightly less than 20 acres, adjacent to the Hermiston Generating Plant. The Union Pacific rail road track divides the Hermiston Generating Plant facility from the proposed Station. Figure G-1 provides apreliminary overview of the energy facility site. When constructed, the Station would be located within a fenced area consisting of slightly less than 20 acres; including a 0.72 acre evaporation pond.

Nominal electric generating capacity is defined in Oregon Revised Statutes (ORS) 469.300 as the maximum net electric power output of an energy facility based on the average temperature, barometric pressure, and relative humidity at the site during times of the year when the facility is intended to operate. The nominal electric generating capacity of the Station is expected to be up to approximately 412 MW.

Each combustion turbine generator (CTG) will generate approximately 100 MW under most ambient conditions. The Station is expected to be operated at a maximum capacity factor of approximately 50 percent, which is equivalent to 4,400 hours per year at full load for each CTG. At less than full load operating hours could increase.

The Station would include up to four blocks of simple-open cycle power. Thermal energy is produced in the CTGs through the combustion of natural gas, which is converted into mechanical energy to drive the combustion turbine compressors and electric generators.

Four GE LMS100 CTGs are expected to be used for the plant. The LMS100 integrates features of GE's frame and aero-derivative CTG design features. The low-pressure compressor is derived from the heavy-duty frame engine designs, and the high-pressure compressor, combustor, and power turbine components are derived from the aero-derivative designs. Each CTG consists of a stationary combustion turbine-generator and associated auxiliary equipment.

Turbine compressor inlet air is drawn through the air inlet ductwork above the combustion turbine. The inlet air filter removes dust and particulate from the air intake. During hot weather the filtered air is cooled by contact with water in the evaporative cooler section of the air inlet ductwork.

Filtered and cooled air drawn into the gas turbine low-pressure compressor section is compressed to an intermediate pressure. Compressing the air causes the air temperature to rise along with the increase in pressure. Cooling the intermediate pressure air before final compression improves the efficiency of the compression process. Hot intermediate pressure air is cooled in a water-cooled heat exchanger (intercooler), external to the compressor, before it enters the high-pressure compressor section.

Hot high-pressure compressed air from the high-pressure compressor discharge flows to the combustion turbine combustor, where high-pressure natural gas is injected into the compressed air and ignited. Water is injected into the combustor to temper the combustion temperature, which reduces the production of thermal NO_x.

Heated air and combustion gas pass from the combustor through the expansion section of the turbine, causing it to rotate. The expander draws energy from the hot compressed gases, causing them to cool as they progress through the expander.

The expander section of the turbine produces enough power to drive both the compressor and the electric generator. Integrating the intercooler between compressor stages in the LMS100, together with higher combustor firing temperatures, has resulted in gross turbine generator efficiency that is approximately ten percent more efficient than similar simple-cycle combustion turbines.

The metal acoustical enclosure, which contains the CTGs and accessory equipment, will be located outdoors. The CTGs will be equipped with the following required accessories to provide safe, reliable operation:

- Evaporative coolers (enhance hot weather performance)
- Inlet air filters (remove dust and particulate from the air)
- Metal acoustical enclosure (reduce sound emissions)
- Duplex shell and tube lube oil coolers for the turbine and generator (cool lubricating oil)
- Annular standard combustor combustion system
- Compressor wash system (cleans compressor blades and restores compressor performance)
- Fire detection and protection system
- Compressor intercooler (improves efficiency of the compressor)
- Hydraulic starting system
- Combustor water injection system (for NOX control and output enhancement)
- The combustion gases exit the turbine at approximately 770°F and then pass through the hot SCR system for NOX emission control and an oxidizing catalyst for control of CO and VOC emissions. The SCR is used in conjunction with NH3 injection for the control of NOX emissions. An NH3 solution is injected into the CTG exhaust gas stream that passes over a catalyst bed, which reduces the NOX to inert nitrogen.
- The SCR equipment includes a reactor chamber, catalyst modules, aqueous NH3 storage, vaporization and injection system, and monitoring equipment and sensors. The aqueous NH3 storage area will consist of a tank on a concrete pad with a boxed containment wall. After passing though the SCR, the exhaust gases exit through the attached stack.

According to the Auer land use classification scheme, a 3-kilometer radius boundary around the proposed site yields a predominately rural classification, with some heavy industrial sites located within the 3-kilometer radius.

Table 2 lists the potential to emit from the proposed project. Based upon the emissions listed in Table 2, PSD would be triggered for NO_x, CO, PM10, PM2.5 and CO_2e.

TABLE 2 Potential to Emit for the Station

Pollutant	Proposed Facility TPY	PSD Major Modification Thresholds TPY
NO_x	126	40
CO	224	100
VOC	25	40
SO_x	14	40
PM10	60	15
PM2.5	60	10
CO_2e	1,045,384	75,000

PROPOSED AIR QUALITY DISPERSION MODELS

The United States Environmental Protection Agency (USEPA) dispersion models proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations include the AERMOD modeling system (version 12345 with the associated receptor processing program AERMAP version 11103) for modeling most facility operational and construction impacts in both simple and complex terrain, the Building Profile Input Program for PRIME (BPIP-PRIME version 04274) for determining building dimensions for downwash calculations in AERMOD. AERMOD meteorological data was processed using AERMET version 11059 and AERSURFACE, version 13016. These models, along with options for their use and how they are used, are discussed below. These models will be used for the following:

- Comparison of operational impacts to Class I and Class II significant impact levels (SILs)
- PSD increments
- National Ambient Air Quality Standards (NAAQS)
- Cumulative impacts analyses with AERMOD in accordance with ODEQ requirements

EXISTING METEOROLOGICAL AND AIR QUALITY DATA

Available Meteorological Data: Hourly observations of certain meteorological parameters are used to define the area's dispersion characteristics. These data are used in approved air dispersion models for defining a project's impact on air quality. These data must meet certain criteria established by the USEPA and ODEQ and the following discussion details the proposed data and its applicability to this project.

The nearest representative surface data set in the general area of the proposed Station was collected at the nearby Umatilla Army Depot (Depot) for the years 1995 through 1999 (5 years). The Depot monitoring station is located approximately 4.5 kilometers northwest of the proposed project. An additional year was also provided by the ODEQ that represents data that was collected at the Hermistion Generation Station in 1994.

The Depot data represents the most recent five (5) years of data collection and was obtained from the ODEQ. For each of the years, the surface data recovery exceeds 90 percent which satisfies the PSD requirements for data recovery. The Depot site elevation and the proposed project elevation differ by approximately 30 meters and both lie within the Columbia River Valley. The surrounding terrain are identical at the two locations. The representative upper air data was obtained from Spokane International Airport.

The area surrounding the project site, within three (3) km, can be characterized as rural, made up largely of shrub lands and pasture/hay, based on review of land use/land cover data as well as recent aerial photo data. In accordance with the Auer land use classification methodology (USEPA's "*Guideline on Air Quality Models*"), land use within the area circumscribed by a three km radius around the facility is greater than 50 percent rural. Therefore, in the modeling analyses supporting the permitting of the facility, no urban coefficients will be assigned.

Meteorological Data Representativeness: The proposed use of the five (5) years of supplied surface meteorological data collected at the Depot monitoring location would satisfy the definition of on-site data. USEPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates from the Clean Air Act in Section 165(e)(1), which requires an analysis "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility." This requirement and USEPA's guidance on the use of on-site monitoring data are also outlined in the On-Site Meteorological Program Guidance for Regulatory Modeling Applications (USEPA, 1987). The representativeness of meteorological data is dependent upon: (a) the proximity of the meteorological monitoring site to the area under consideration; (b) the complexity of the topography of the area; (c) the exposure of the meteorological sensors; and (d) the period of time during which the data are collected.

First, the meteorological monitoring site and proposed project location are at approximately the same elevation and with similar topography surrounding each location. Second, the two sites are located roughly about the same distance and in the same orientation to the significant terrain features in the region that influence wind flow patterns. These terrain features are part of the same large scale terrain features in the area that are oriented in a southwest to northeast direction. There are no specific terrain features in the project area that would cause directional steering of locally generated winds or would influence the predominant meteorology in the project area. Third, the surface characteristics roughness length, Bowen ratio, and albedo are relatively consistent throughout the area and are nearly identical between the project site and the meteorological monitoring location.

Representativeness is defined in the document "Workshop on the Representativeness of Meteorological Observations" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as is the case with the meteorological monitoring site and the proposed project location. In determining the representativeness of the meteorological data set for use in the dispersion models at the project site, the consideration of the correlation of terrain features to prevailing meteorological conditions, as discussed earlier, would be nearly identical to both locations since the orientation and aspect of terrain at the proposed project location correlates well with the prevailing wind fields as measured by and contained in the meteorological dataset. In other words, the same mesoscale and localized geographic and topographic features that influence wind flow patterns at the meteorological monitoring site also influence the wind flow patterns at the proposed project site.

Surface characteristics were determined with AERSURFACE using Land Use/Land Cover (LULC) data in accordance with USEPA guidance documents ("*AERMOD Implementation Guide,*" 1/09/08; and "*AERSURFACE User's Guide*," EPA-454/B-08-001, 1/08) as described below. AERSURFACE uses U.S. Geological Survey (USGS) National Land Cover Data 1992 archives (NLCD92) to determine the midday albedo, daytime Bowen ratio, and surface roughness length representative of the surface meteorological station. ***Bowen ratio*** is based on a simple unweighted geometric mean while ***albedo*** is based on a simple unweighted arithmetic mean for the 10x10 km square area centered on the selected location (i.e., no direction or distance dependence for either parameter). ***Surface roughness length*** is based on an inverse distance-weighted geometric mean for upwind distances up to one (1) km from the selected location. The circular surface roughness length area (1-km radius) can be divided into any number of sectors as appropriate (USEPA guidance recommends that no sector be less than 30° in width). Based on the predominant land use around Winslow and the HBP sites, AERSURFACE was run with 12 sectors for each site. For each season, there was no difference between sectors for Albedo, Bowen Ratio and Roughness Length. Thus, in the final analysis, AERMET will be executed using one 360-degree sector for roughness lengths obtained from AERSURFACE for the Winslow monitoring location

Running AERSURFACE at both the meteorological monitoring and proposed site locations produced almost identical results for both Bowen ratio and Albedo, based on the 10 kilometer area around each location. There were some variations in land cover and roughness lengths between the two locations based on a one kilometer radius, but both areas are mostly rural. Table 3 presents the AERSURFACE land use types within one kilometer of the meteorological monitoring and project locations. Based on the Auer land use classifications, both locations are classified as rural and there is good correlation of the rural characteristic land types between the two locations. These areas, although including the paved runway surfaces, have low surface roughness lengths more closely comparable to rural categories than areas with commercial/industrial buildings/structures. Comparing the LULC data at the project site to the meteorological monitoring site showed that the same general land use categories exist around the project site and the meteorological monitoring site, with the both locations having 90 percent associated with open, rural areas. Thus, the predominant land use in the area is made up of rural categories.

Comparing one 360 degree sector AERSURFACE outputs in Table 4 shows that the average surface characteristics by season are also very similar. For roughness length, the variations between the two sites are minimal. Roughness lengths are often categorized into classes between 0 (water) and 4 (urban). Open land areas, low vegetation areas, and agriculture are often assigned roughness lengths of 0.01 (class 1) to 0.16 (class 2). Thus, it is noted that there are no changes in classes between the two locations and the predominant land use activity in the project and meteorological monitoring locations are associated with shrubland.

Table 3 AERSURFACE Land Cover Counts: Surface Roughness (1 km)		Depot		Station	
LULC Category		**Count**	**%Total**	**Count**	**%Total**
11	Open Water:	0	0.0%	93	2.7%
12	Perennial Ice/Snow:	0	0.0%	0	0.0%
21	Low Intensity Residential:	0	0.0%	87	2.5%
22	High Intensity Residential:	0	0.0%	0	0.0%
23	Commercial/Industrial/Trans:	983	28.2%	28	0.8%
31	Bare Rock/Sand/Clay:	0	0.0%	0	0.0%
32	Quarries/Strip Mines/Gravel:	0	0.0%	0	0.0%
33	Transitional:	0	0.0%	0	0.0%
41	Deciduous Forest:	0	0.0%	0	0.0%
42	Evergreen Forest:	0	0.0%	0	0.0%
43	Mixed Forest:	0	0.0%	0	0.0%
51	Shrubland:	2488	71.3%	1891	54.1%
61	Orchards/Vineyard/Other:	0	0.0%	0	0.0%
71	Grasslands/Herbaceous:	18	0.5%	24	0.7%
81	Pasture/Hay:	0	0.0%	1368	39.2%
82	Row Crops:	0	0.0%	0	0.0%
83	Small Grains:	0	0.0%	0	0.0%
84	Fallow:	0	0.0%	0	0.0%
85	Urban/Recreational Grasses:	0	0.0%	0	0.0%
91	Woody Wetlands:	0	0.0%	0	0.0%
92	Emergent Herbaceous Wetlands:	0	0.0%	0	0.0%
	Total:	3489	100.0%	3491	100.0%

Table 4 AERSURFACE Results/Inputs for Depot and Station

Parameter by Season (Month)	Depot	Station
Surface Roughness (meters)		
Winter (Jan-Mar)	0.117	0.056
Spring (Apr-Jun)	0.117	0.068
Summer (July-Sept)	0.118	0.142
Fall (Oct-Dec)	0.118	0.142

Albedo		
Winter (Jan-Mar)	0.22	0.21
Spring (Apr-Jun)	0.21	0.19
Summer (July-Sept)	0.22	0.22
Fall (Oct-Dec)	0.22	0.22
Bowen Ratio		
Winter (Jan-Mar)	2.49	1.77
Spring (Apr-Jun)	1.28	0.88
Summer (July-Sept)	1.78	1.26
Fall (Oct-Dec)	2.49	1.77
AERSURFACE Inputs	**Latitude/Longitude**	**UTM Zone 11**
UTM-X(m)	45.84594	316026.3
UTM-Y(m)	-119.417472	5074829.6
Datum	NAD83	NAD83
Source	No	No
Snow Cover	Yes	Yes
Arid Region	Yes	No
Airport Location	Average	Average
Surface Moisture	1.0	1.0
Surface Roughness Radius (km)	1 (0-360°)	1 (0-360°)
Number of Sectors	**0.117**	0.056

Additionally, wind rose plots for the 1994 Hermiston data set was compared to the five year Depot data set, from which an similar frequency distribution exists between the two sites. Plots from both sites are presented in the Appendix.

For these reasons as discussed above, the Umatilla Army Depot meteorological data selected for the proposed project are expected to satisfy the definition of representative meteorological data. Thus, it is our assessment that this meteorological data are identical to the dispersion conditions at the project site and to the regional area. As noted above, these data will be processed using AERMET based on one (1) 360-degree sector for roughness lengths in AERSURFACE based on the Winslow ASOS monitoring location.

Existing Baseline Air Quality Data: The nearest criteria pollutant air quality monitoring sites to the proposed project site is the monitoring station located at Hermiston, which has collected hourly ozone (2009-2011), NO_2 (2007), PM2.5 (2007) and CO (2008-2010) data. Ambient data has been collected at other sites within Oregon and are summarized in Table 5. Ozone data will also be used, as needed, for the calculation of NO_2 concentrations using the Ozone Limiting Method or the Plume Volume Molar Ratio Method (PVMRM), as needed. Data from this site is proposed to representative of background PM10 and PM2.5 in the HBP impact area(s).

Table 5 Background Concentration Data Summaries

Units	Avg Time	Site	2004	2005	2006	2007	2008	2009	2010	2011	Background Value*
					OZONE						
ppm	8 Hr-4th Highest	Hermiston						.061	.063	.058	.063
ppm	3 yr Avg of 4th High	Hermiston						.063	.063	.060	.063
					NO_2						
ppb	98th percentile of daily max	Hermiston				37					
ppb	Max 1 Hr Avg	Hermiston				47					
ppb	AAM	Hermiston				8					
ppb	98th percentile of daily max	Portland-Lafayette						40	33	33	40
ppb	Max 1 Hr Avg	Portland-Lafayette						55	40	39	55
ppb	AAM	Portland-Lafayette						10	9	9	10
					SO_2						
ppm	1 Hr-99th percentile	Portland-Lafayette						9	8	9	9
ppm	3 Hr Avg Max	Portland-Lafayette						10	8	6	10
ppm	3 Hr Avg of 2nd High	Portland-Lafayette						8	8	6	8
					PM10						
ug/m^3	24 Hr-Max	La Grande					29	53	37		
ug/m^3	24 Hr-2nd High	La Grande					29	34	32		
ug/m^3	24 Hr-Max	Pendleton				56	39	64			64
ug/m^3	24 Hr-2nd High	Pendleton				49	38	40			49
					PM2.5						
ug/m^3	24 Hr-Max	Hermiston-AP				28					
ug/m^3	24 Hr-98th percentile	Hermiston-AP				3					
ug/m^3	AAM	Hermiston-AP				ND					
ug/m^3	24 Hr-Max	Hermiston-PS				32					

ug/m^3	24 Hr-98th percentile	Hermiston-PS	24					
ug/m^3	AAM	Hermiston-PS	ND					
ug/m^3	24 Hr-Max	Pendleton			23	20	26	26
ug/m^3	24 Hr-98th percentile	Pendleton			22	18	26	26
ug/m^3	AAM	Pendleton			7.8	6.9	7.5	7.8
			CO					
ppm	1 Hr-Max	Eugene-Lane Coll.		2.4	2.1	2.2		2.4
ppm	1 Hr-2nd High	Eugene-Lane Coll.		2.2	2.1	1.9		2.2
ppm	8 Hr-Max	Eugene-Lane Coll.		1.7	1.6	1.5		1.7
ppm	8 Hr-2nd High	Eugene-Lane Coll.		1.7	1.6	1.3		1.7

*Background value based on the most recent 3 years of data, if 3 years is available.
All data extracted from: 2011 Oregon Air Quality Data Summaries, ODEQ-Air Division, DEQ-11-AQ-021, June 2012.

Notes:

1. For NO_2, the Portland-LaFayette data for 2009-2011 seems to "bound" the old Hermiston data from 2007/2008, so to be conservative the Portland data was used to characterize background.
2. For SO_2, very little data exists in the state, with no useable data for the eastern portion. As such, using the Portland-LaFayette data for SO_2 should result in a conservative estimation or background.
3. For PM10, the Pendleton data was chosen as it is closer to the site and shows higher values than La Grande, although an average of the two sites may result in a more realistic estimate of background.
4. For PM2.5, the Pendleton data was used.
5. For CO, the Eugene-Lane College data was used as this data represents a rural site in close proximity to the Eugene urban area, therefore it should give a reasonable representation of the site background.

The project area is designated attainment/unclassified for all ambient air quality standards. For the statistical form of the hourly SO_2, NO_2 and 24-hour PM2.5 concentrations, the 98th percentile background will be used for the modeling analyses. For background 24-hour PM10, the high second high will be used.

AIR QUALITY MODELING PROCEDURES WITH AERMOD

Several dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources and operating parameters. AERMOD will be used to determine facility impacts on Class II areas in the immediate Project vicinity in simple, intermediate, and complex terrain areas. The AERMOD model will be used for comparison of impacts to significant impact levels, PSD Increments and NAAQS.

Refined Modeling: The purpose of the refined modeling analysis will be to demonstrate that air emissions from the Station will not cause or contribute to a NAAQS or Increment violation and will not cause a significant health risk impact. For modeling the project's operational impacts on nearby simple and complex terrain, the AERMOD model will be used with five (5) years of hourly meteorological data.

AERMOD is a steady-state plume dispersion model that simulates transport and dispersion from multiple point, area, or volume sources based on updated characterizations of the atmospheric boundary layer. AERMOD uses Gaussian distributions in the vertical and horizontal for stable conditions, and in the horizontal for convective conditions; the vertical distribution for convective conditions is based on a bi-Gaussian probability density function of the vertical velocity. For elevated terrain AERMOD incorporates the concept of the critical dividing streamline height, in which flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. AERMOD also uses the advanced PRIME algorithm to account for building wake effects.

As part of the input requirements into AERMET and AERMOD, a land use classification must be made. The area surrounding the Project site was determined to be primarily rural following the methods outlined by the Auer land use classification method. As part of the AERMET input requirements, albedo, Bowen ratio, and Surface Roughness must be classified by season. These values will be determined with the AERSURFACE using the latest USEPA guidance (i.e., AERMOD Implementation Guide, revised January 9, 2008, and the AERSURFACE User's Guide (USEPA-454/B-08-001) as described earlier. AERMOD input data options are listed below following these USEPA modeling guidance documents.

- Final plume rise
- Stack tip downwash
- Regulatory default option (i.e., calm and missing meteorological data processing and elevated terrain heights option)

Flagpole receptors are not proposed to be used. AERMAP will be used to calculate receptor elevations and hill height scales for all receptors from NED GeoTIFF data in accordance with USEPA and ODEQ guidance.

Annual NO_2 concentrations will be calculated using the Ambient Ratio Method (ARM), adopted in Supplement C to the *Guideline on Air Quality Models* (USEPA, 1994). The Guideline allows a nationwide default conversion rate of 75% for annual NO_2/NO_x ratios. For use in either the OLM or PVMRM, the initial in stack ratio of NO_2/NO_x will be based on existing EPA or State data.

<u>Federal 1-hour NO_2 NAAQS Modeling:</u>

EPA established a new 1-hour standard at a level of 100 ppb (188.68 µg/m3), based on the 3-year average of the annual 98th percentile of the daily maximum 1-hour concentrations in addition to the existing annual secondary standard (100 µg/m3). EPA has also established requirements for a NO_2 monitoring network that will include monitors at locations where maximum NO_2 concentrations are expected to occur, including within 50 meters of major roadways, as well as monitors sited to measure the area-wide NO_2 concentrations that occur more broadly across communities.

To assess the Federal 1-hour NO_2 Standard, the methods summarized below are proposed for use. Specifically, the following methods will be used:

- First high with OLM or PVMRM will be used for significant impact levels (SILs) for 1-hour NO_2.
- OLM/PVMRM with recommended EPA in stack NO_2/NO_x ratios based on the most recent updated data provided on the EPA TTN SCRAM web site.
- Background Ozone from the Hermiston and NO_2 data from Portland monitoring stations.

Either the OLM or PVMRM is proposed for use. Hourly ozone data collected at the Hermiston monitoring station will be used to calculate hourly NO_2 concentrations from hourly NO_x concentrations. The three most recent years of ozone data used will be used. Both the OLM and PVMRM are incorporated into the AERMOD program and involves an initial comparison of the estimated maximum NO_x concentration and the ambient O_3 concentration to determine which is the limiting factor to NO_2 formation. If the O_3 concentration is greater than the maximum NO_x concentration, total conversion is assumed. If the NO_x concentration is greater than the O_3 concentration, the formation of NO_2 is limited by the ambient O_3 concentration. In this case, the NO_2 concentration is set equal to the O_3 concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion.

As summarized in EPA's Policy Memorandum, OLM is proposed based on five selected criteria:

1. **The model has received a scientific peer review:**

   As noted in the U.S. EPA's June 2010 guidance document, because AERMOD is the preferred model for dispersion for a wide range of applications, the alternative model demonstration for use of the OLM/PVMRM options within AERMOD focuses on the treatment of NO_X chemistry within the model, and does not need to address basic dispersion algorithms within AERMOD. The chemistry for OLM has been peer-reviewed, as noted by the documents posted on the U.S. EPA's Support Center for Regulatory Air Modeling web site. The posted documents include *Sensitivity Analysis of PVMRM and OLM in AERMOD* (MACTEC, 2004) and *Evaluation of Bias in AERMOD-PVMRM* (MACTEC, 2005). Both documents indicate that the models appear to perform as expected.

2. **The model can be demonstrated to be applicable to the problem on a theoretical basis:**

   As noted in the document entitled "Sensitivity Analysis of PVMRM and OLM In AERMOD" prepared by Roger W. Brode "This report presents results of a sensitivity analysis of the PVMRM and OLM options for NO_x to NO_2 conversion in the AERMOD dispersion model. Several single source scenarios were examined as well as a multiple-source scenario. The average conversion ratios of NO_2/NO_x for the PVMRM option tend to be lower than for the OLM option and for the Tier 2 option or the Ambient Ratio Method which has a default value of 0.75 for the annual average. The sensitivity of the PVMRM and OLM options to emission rate, source parameters and modeling options appear to be reasonable and are as expected based on the formulations of the two methods. For a given NO_x emission rate and ambient ozone concentration, the NO_2/NO_x conversion ratio for PVMRM is primarily controlled by the volume of the plume, whereas the conversion ratio for OLM is primarily controlled by the ground-level NO_x concentration.

   Overall the PVMRM option appears to provide a more realistic treatment of the conversion of NO_x to NO_2 as a function of distance downwind from the source than OLM or the other NO_2 screening options (Hanrahan, 1999a; Hanrahan, 1999b). No anomalous behavior of the PVMRM or OLM options was identified as a result of these sensitivity tests."

   Based on this report for both OLM/PVMRM appear to be applicable to the problem of NO_2 formation and as noted by the author provides a better estimation of the NO_2 impacts compared to other screening options (Tier 1 and 2).

3. **The databases which are necessary to perform the analysis are available and adequate:**

   The data needed to conduct an OLM run with hourly background NO_2 data are the hourly meteorological data, hourly ozone data, hourly background NO_2 data, and in-stack NO_2/NO_x ratios. The hourly ozone and meteorological data exist for the same general location.

4. **Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates:**

   As noted in *Evaluation of Bias in AERMOD-PVMRM* (MACTEC, 2005), which was prepared by Roger W. Brode, PVMRM has been judged to provide unbiased estimates based on criteria that are comparable to, or more rigorous than, evaluations performed for other dispersion models. At the present time no assessment of bias has been conducted for the OLM algorithm. It has been shown in the sensitivity analysis that OLM provides similar more conservative results than PVMRM. Therefore is it assumed that both OLM or PVMRM would provide an unbiased estimate of the modeled concentrations.

5. **A protocol on methods and procedures to be followed has been established.** The methods and procedures outlined in this protocol are proposed for implementation.

GEP Stack Height and Downwash: Stack locations and heights and building locations and dimensions will be input to BPIP-PRIME. The first part of BPIP-PRIME determines and reports on whether a stack is being subjected to wake effects from a structure or structures. The second part calculates direction-dependent "equivalent building dimensions" if a stack is being influenced by structure wake effects. The BPIP-PRIME output is formatted for use in AERMOD input files.

Receptor Selection: Receptor and source base elevations will be determined from US Geological Survey (USGS) National Elevation Dataset (NED) data in the GeoTIFF format at a horizontal resolution of 1 arc-second. All coordinates (both sources and receptors will be referenced to UTM North American Datum 1983 (NAD83, Zone 12).

Cartesian coordinate receptor grids will be used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. The maximum extent of the significant impact isopleth for any pollutant will be used to represent the impact radius.

For the full impact analyses, a nested grid will be developed to fully represent the significance area(s) and maximum impact area(s), with spacing as needed in order to obtain the maximum modeled concentration. The fence line receptor grid will be based on 10 meters.

The downwash receptor grid will have a receptor spacing of 20-meters along the facility fence line out to 500 meters from the Station. An intermediate receptor grid with 100-meter receptor spacing will extend from the downwash receptor grid out to 1000 meters from the Station.

A coarse receptor grid with 200-meter receptor spacing will extend from the intermediate receptor grid outwards at least five(5) kilometers. The coarse grid spacing will be 500 meters and will extend out ten (10) kilometers in all directions.

When maximum impacts occur in areas outside the 20-meter spaced receptor grid, additional refined receptor grids with 20-meter resolution will be placed around the maximum impacts and extended as necessary to determine maximum impacts. Ambient concentrations inside the property fence line will not be modeled.

<u>Ambient Air Quality Impact Analyses:</u> In evaluating the impacts of the proposed project on ambient air quality, ADI will model the ambient impacts of the project, add those impacts to background concentrations, and compare the results to the state and Federal ambient standards for SO_2, NO_2, PM_{10}, $PM_{2.5}$, and CO. The project impacts will also be compared to the PSD significance levels for NO_2, PM_{10}, $PM_{2.5}$, and CO .

In accordance with USEPA guidance (40 CFR part 51, Appendix W, Sections 11.2.3.2 and 11.2.3.3), the highest modeled concentration will be used to compare with the SILs. The highest modeled concentration will be used to demonstrate compliance with all short-term and annual NAAQS for PM10. With respect to the Federal 1-hour NO_2 and PM2.5 24-hour standard, the 98th percentile will be used. Compliance with other short-term NAAQS may also be demonstrated consistent with the format of the short-term NAAQS (see 40 CFR 50).

<u>NAAQS and PSD Compliance Demonstration:</u> To demonstrate that the emissions from the proposed projects will not cause or contribute to a violation of the NAAQS or Increment, a multi-source cumulative modeling analysis may be required by the ODEQ for all project impacts that exceed the applicable SILs. Typically, this analysis considers both the existing and background sources, as established by ambient monitoring data, and the contribution from additional sources, which might not be reflected by the monitoring data, but could interact with the facility's potential impacts through a significant concentration gradient. The project team will work with the ODEQ to develop an air emission inventory for all sources located within the Significant Impact Area (SIA) which is defined as the largest extent of the areal SIL plus a 50 kilometer screening area. For the increment assessment, all emission increase since the major source baseline date will be modeled. For PM2.5, it is assumed that this project will trigger the major source baseline date for this area.

CLASS I AREA AQRV ANALYSIS

This facility will be a major source for criteria pollutant emissions and is therefore automatically subject to PSD permitting requirements. However, because significant impacts at nearby Class I areas will exceed the SIL for some pollutants, an air quality analysis is warranted for NO_x, CO, and PM10 and PM2.5 Additional PSD Class I Air Quality Related Values (AQRV) analyses, including visibility are also required. The nearest Class I area is the Eagle Cap Wilderness Area, located approximately 130 km to the southeast (see Figure 2). Six (6) additional Class I areas are within 250 km of the facility. In addition, the Columbia River Scenic Gorge area is located approximately 129 kilometers west of the project. Therefore, in conjunction with guidance from the USFS

(Rick Graw personal communication) and the Oregon DEQ, a separate Regional Haze analyses will be performed on this area. The range of distances to each area are listed in Table 6, below.

Following the most recent FLAG Workshop procedures (June 2010), the use of the Screening Procedure (Q/D) to determine if the project could screen out of a formal AQRV assessment for visibility and nitrogen deposition was made. Following the screening procedures in FLAG, the emissions of NO_x, SO_x, PM10/2.5, and H_2SO_4 were summed after adjusting the emissions to reflect 8,760 hours of operation. The screening analysis is summarized below:

- $Q = sum(NO_x+PM10/2.5+SOx+H_2SO_4) = 290$

If Q/D is less than 10, then no AQRV analysis is required. Based on the ratio of Q/D, none of the Class I areas have a Q/D of greater than 10, as summarized in Table 7. Therefore, it is proposed that no further analysis of AQRV for visibility or nitrogen deposition are required for those areas. The screening assessment does not apply to Class I increment or NAAQS, which are based solely on the Class I SILs. Therefore, Class I significance modeling for increment and NAAQS may need to be assessed for those areas with 200 km if the project triggers the criteria for a PSD assessment.

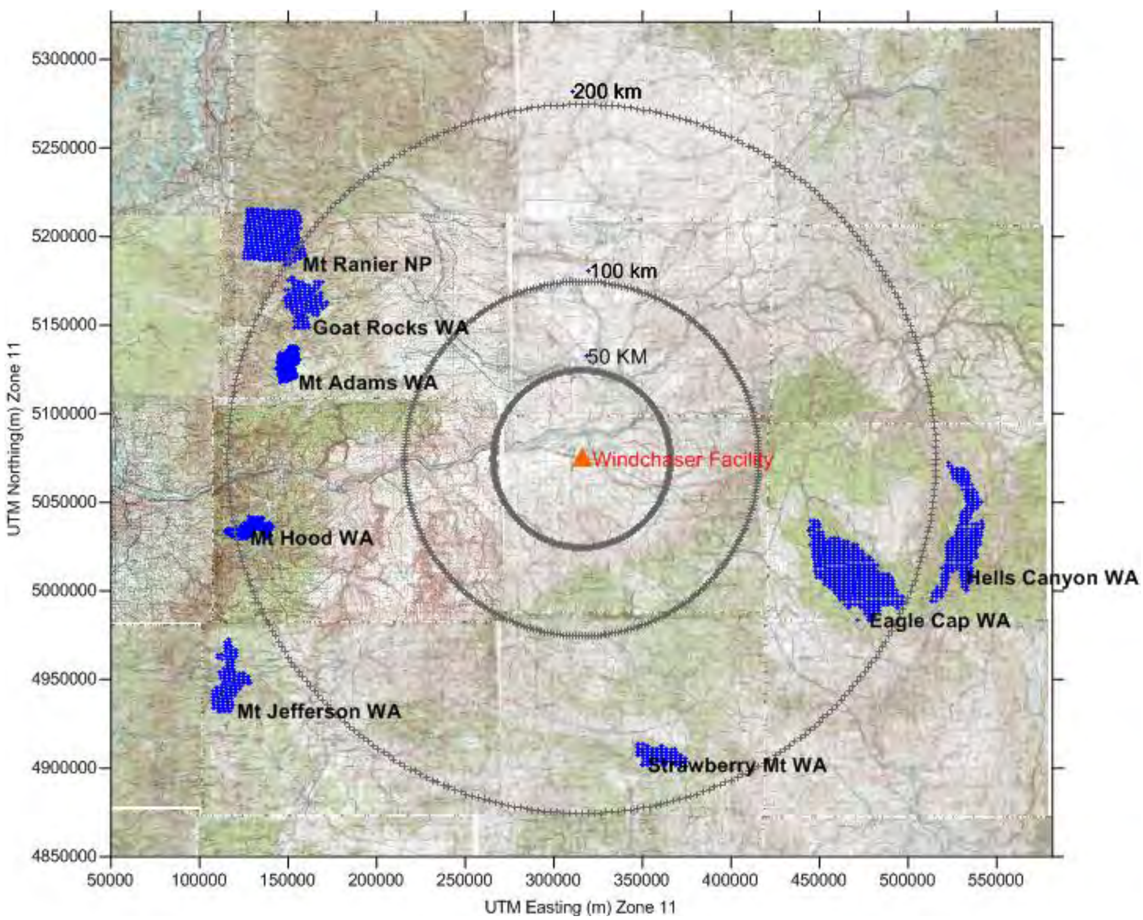
Table 6 – Distance to Class I Areas

Class I Area	*Minimum Distance (km)*	*Maximum Distance (km)*
Strawberry Mt Wilderness Area	164.4	182.8
Eagle Cap WA	133.9	198.8
Goat Rocks WA	168.3	193.8
Mt Rainier NP	193.7	235.6
Mt Adams WA	167.6	235.6
Mt Jefferson WA	225.5	251.4
Mt Hood WA	178.89	251.4
Columbia River Scenic Gorge	121.0	250.0

Table 7-Screening Analyses for modeling in Class I Areas Q/D

Class I Area	Minimum Distance (km)	Maximum Distance (km)	Q/D
Strawberry Mt Wilderness Area	164.4	182.8	1.76
Eagle Cap WA	133.9	198.8	2.17
Goat Rocks WA	168.3	193.8	1.72
Mt Rainier NP	193.7	235.6	1.49
Mt Adams WA	167.6	235.6	1.73
Mt Jefferson WA	225.5	251.4	1.29
Mt Hood WA	178.89	251.4	1.04
Columbia River Scenic Gorge	121.0	250.0	2.40

Figure 2- Wind Chaser Project Location with respect to Class I Areas



<u>CALPUFF Modeling Procedures:</u> Based on the results of the Q/D analysis, CALPUFF is not proposed for use to assess AQRV impacts at the listed Class I areas. Rather, the CALPUFF model will be used in refined mode, with a meteorological data set based on

2006, 2007, and 2008 12 kilometer resolution MM5/WRF data to assess the Class I SILs, increment consumption and NAAQS impacts for all Class I areas as the distances are greater than 50 kilometers from the project site.

Modeling of air quality impacts in the Class I areas will be performed using CALPUFF (version 5.8, level 070623) in refined mode following guidance provided in the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Summary Report (December 1998), the Federal Land Managers Air Quality Related Values Workgroup (FLAG) – Phase 2 Report (2010), and consistent with guidance input from Mr. John Notar of the National Park Service and Rick Graw of the USFS. All switches for CALMET and CALPUFF will be based on the document, "CALPUFF Reviewer's Guide", May 2011, as supplied by the FLMs. For the separate Regional Haze analyses for the Columbia River Gorge Scenic Area, the latest BART version of the CALMET/CALPUFF system, V6.112 will be used as necessary.

Speciation of the project emissions will follow FLAG guidelines for natural gas turbines. No fuel oil is proposed for this project.

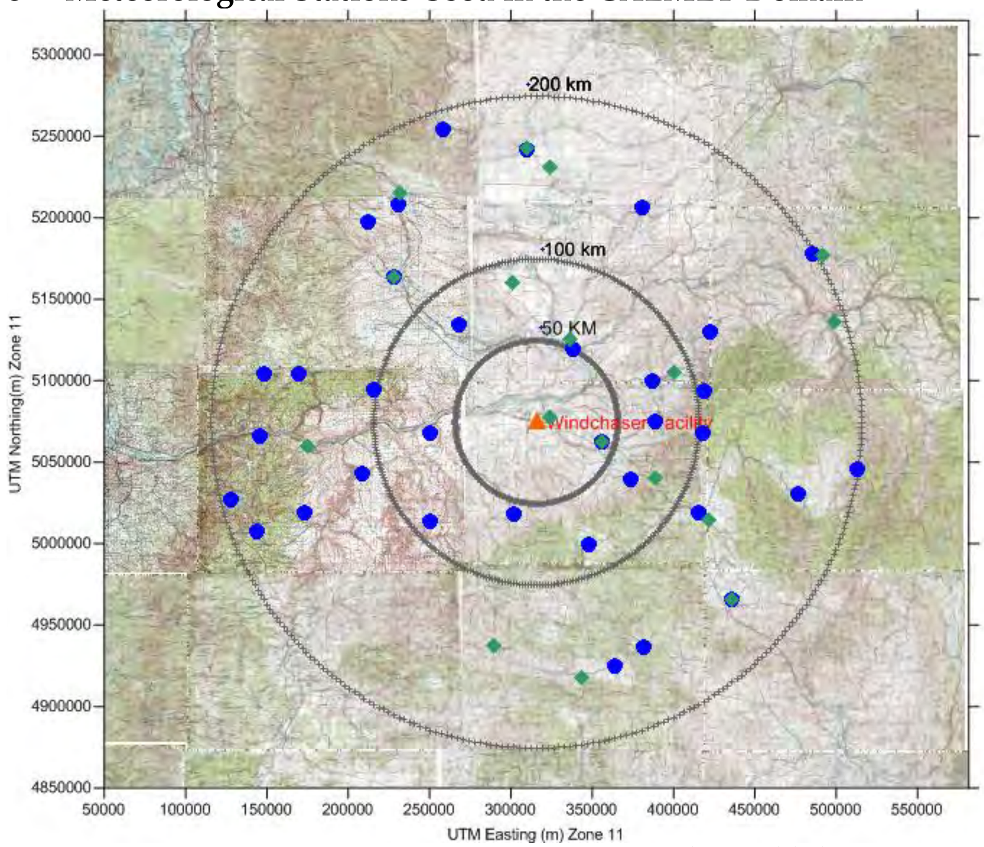
Meteorological Data: CALMET will be used to combine the MM5/WRF data, surface observations, upper air observations, terrain elevations, and land use data into the format required by CALPUFF. CALMET adjusts winds objectively using both observations and numerical predictions according to options specified by the user. In addition to calculating the three-dimensional wind field, CALMET also estimates the boundary layer parameters used to characterize diffusion and deposition by the dispersion model. The previously approved version of CALMET, Version: 5.815, Level: 070623 will be used.

The modeling domain covers a 300-km by 300-km region of Oregon, Washington, and Idaho, centered approximately at the project site. The Lambert Conformal Coordinate (LCC) system will be used for the analysis, with a reference latitude and longitude of 40 and 97 degrees. The CALMET grid mesh size will be 4 km.

The first step in the data processing is to extract the MM5/WRF data for the modeling domain. The 2006-2008 MM5/WRF data has been obtained from a private source, Alpine Geophysics. The next step in CALMET processing is to assemble the surface and upper air data within the 300 kilometer model domain. Surface data was obtained from NCDC for stations located within or near the modeling domain. Precipitation data was acquired from NCDC for the stations in or near the domains sparse in the project area. These stations are shown in Figure 3. The upper air stations within the domain are listed in the Appendices, and include stations in Oregon, Washington, and Idaho. These data sets are summarized in Appendix B.

The CALMET processor also requires land use and terrain data to adjust the wind field and affect the calculations performed by the CALPUFF dispersion model. Land use and terrain data will be obtained from the U.S. Geological Survey (USGS) seamless data site, www.seamless.usgs.gov. The resolution of these land use and terrain data sets are both 30 m, respectively. The CALMET model options are summarized in Appendix B.

Figure 3 – Meteorological Stations Used in the CALMET Domain



Blue = Precipitation
Green = Surface Meteorology

CALPUFF Model Settings: CALPUFF model options will be set up in accordance with IWAQM guidance and recommendations by Mr. John Notar of the NPS and Rick Graw of the USFS. All default settings will be selected as specified in the latest recommended guidance document (May 2011) or as requested by the Federal Land Managers. The Class I receptors will be obtained from the Forest Service website, as designated for each area. The background ammonia will be set to those suggested by the FLM as listed in the FLAG Guidance and set to 1.0 part per billion (PPB). The background hourly average ozone data will be collected at the Hermiston monitoring station will be input.

Appendix B presents a tabular summary of the CALPUFF processing options and default values used in the analysis. The CALPUFF model will be run using these input data and control options, and the output will be post-processed using CALPOST to determine the impacts as needed. The CALPUFF and CALPOST modeling options are summarized in Appendix B.

Analyses of the Columbia River Gorge Scenic Area (CRGSA): A separate regional haze modeling analyses for the CRGSA may be requested by the ODEQ and the Forest Service. This request would be to address concerns on the increasing background impacts in this area regarding visibility and deposition. For this analyses, a separate set of CALMET meteorology, based on the four (4) kilometer 2009-2011 WRF data processed with MMIF Version 1.0 will be used with the latest CALPUFF model version, V6.112, and CALPOST V6.131. The MMIF data set has been provided by Rick Graw at the USFS, and will be used as necessary.

FINAL MODELING SUBMITTAL

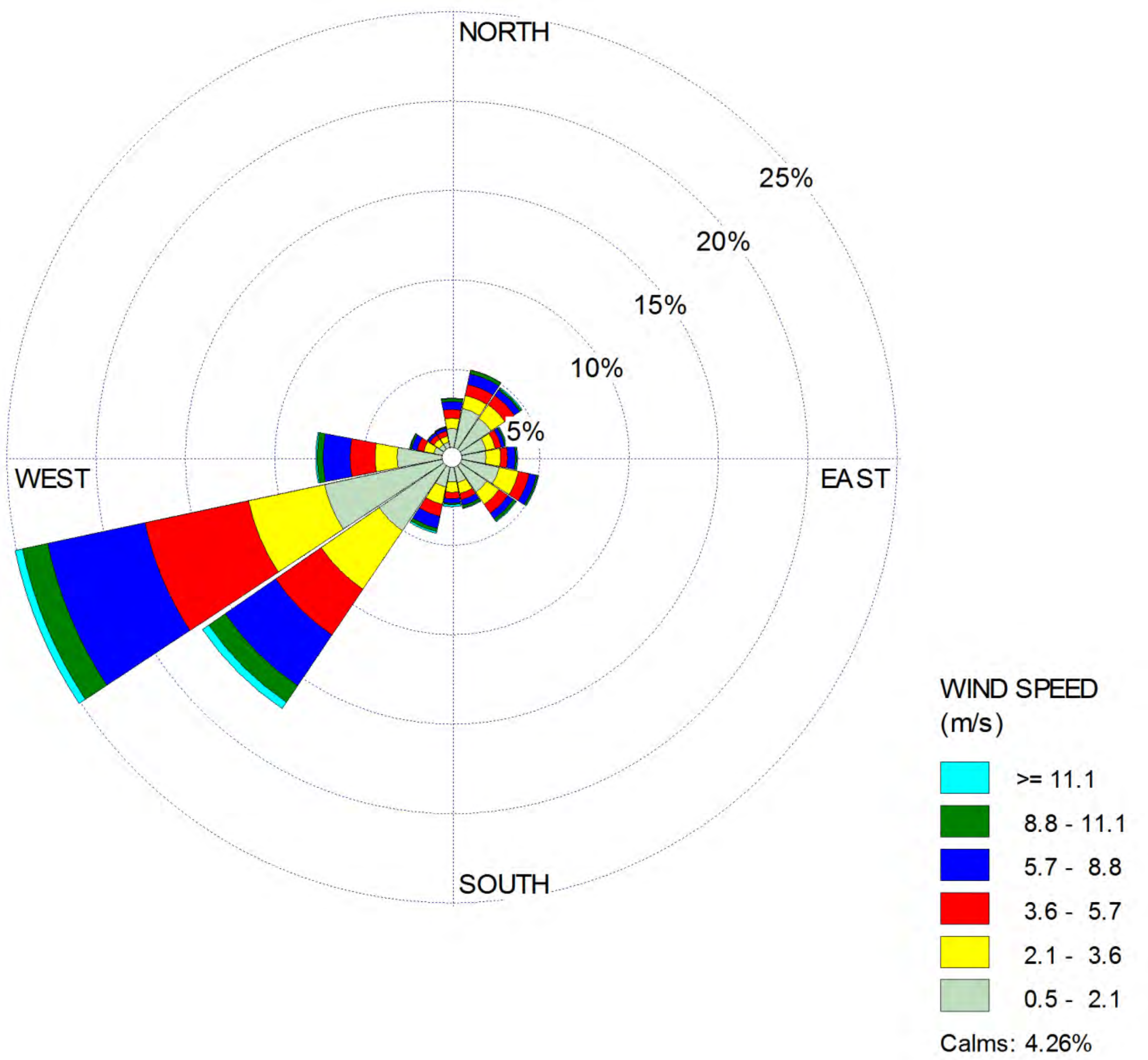
As part of the final modeling analyses, the DEQ will be supplied with the following materials:

- Copies of sections of the US Geological Survey (USGS) 7-1/2-minute (1:24,000) map(s) showing the facility;
- Modeling summaries of maximum impacts for each air quality model;
- All modeling outputs (including BPIP and meteorological files) on CD-ROM disc, together with a description of all filenames;
- Plot plan showing emission points, nearby buildings (including dimensions), property lines, fence lines, and
- Figure showing the building identifiers in the BPIP run(s) and a plot plan.

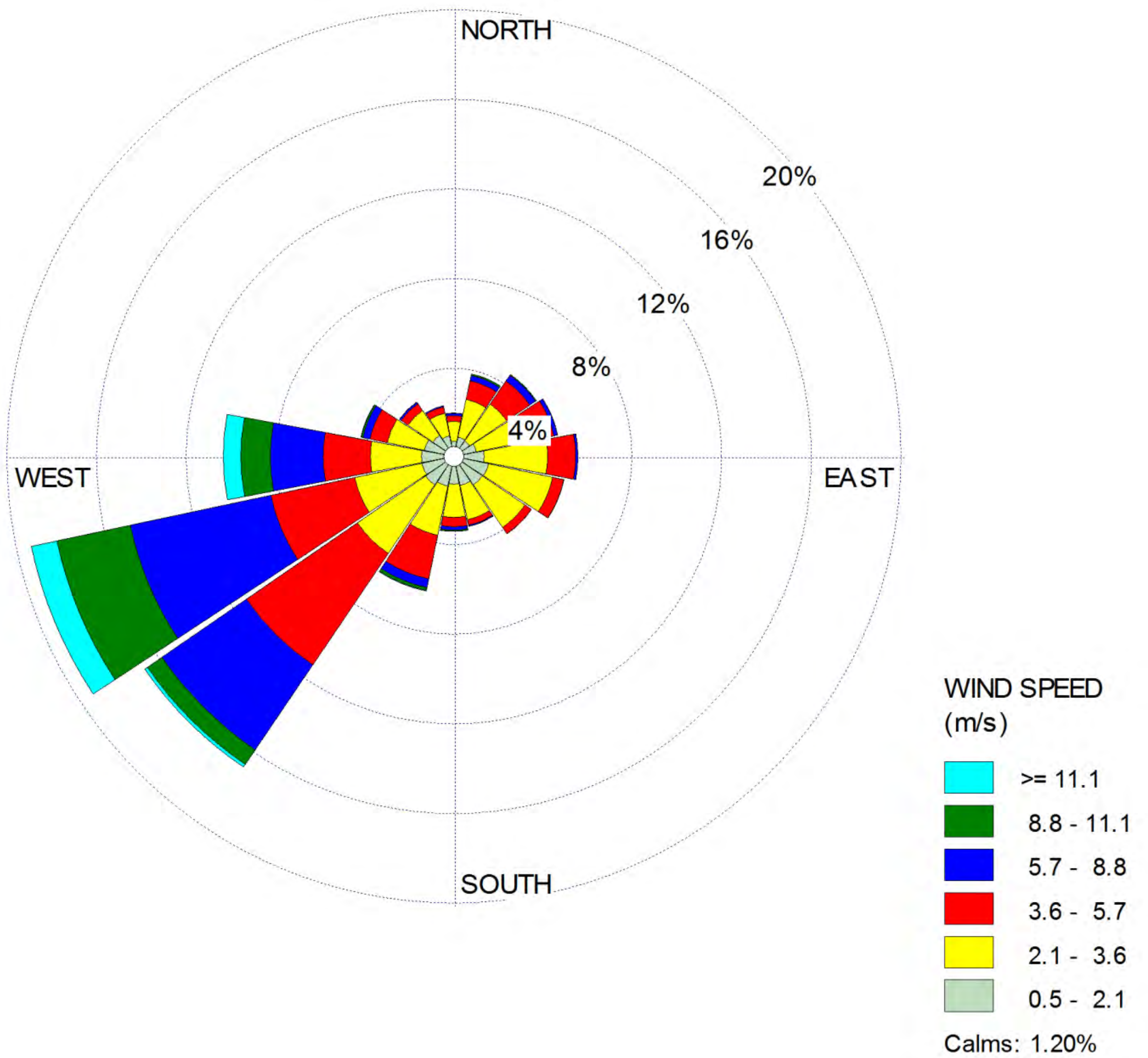
APPENDIX A

Depot and Hermiston Wind Rose Plots

Hermiston Annual (1994)



Depot Annual Wind Rose (1995-1999)



APPENDIX B

CALMET/CALPUFF INPUT OPTIONS AND DATA SETS

Variable	Description	Modeled Value
NZ	Number of vertical layers to be used.	10
IWFCOD	Control variable determining which wind field module is used. (0=objective analysis only, 1=diagnostic wind module.)	1
IFRADJ	Control variable for computing Froude number adjustment effects. (0=do not compute, 1=compute.) (used only if IWFCOD=1).	1
IKINE	Control variable for computing kinematic effects. (0=do not compute, 1=compute.) (used only if IWFCOD=1).	0
IOBR	Control variable for using the O'Brien vertical velocity adjustment procedure. (0=do not use, 1=use.)	0
IEXTRP	Control variable for vertical extrapolation. If ABS(IEXTRP)=1, no vertical extrapolation from the surface wind data takes place. If ABS(IEXTRP)=2, extrapolation is done using a power law profile. If ABS(IEXTRP) = 3, extrapolation is done using the values provided in the FEXTRP array for each layer. If ABS(IEXTRP) = 4 similarity theory is used. If IEXTRP < 0, Layer 1 data at the upper air stations are ignored. Layer 1 at an upper air station is also ignored if the four-character station name of the upper air station matches that of a surface station.	-4
RMIN2	Minimum distance in km between surface station and nearest upper air station for which extrapolation of surface winds at surface station will be performed, when ABS(IEXTRP) > 1. Should be set to -1.0 when all surface data are to be extrapolated.	-1
IPROG	Control variable determining if gridded prognostic model wind fields are used as input. 0 = No, (IWFCOD = 0 or 1) 1 = Yes, use CSUMM winds as Step 1 field, (IWFCOD = 0) 2 = Yes, use CSUMM winds as initial guess field (IWFCOD = 1) 3 = Yes, use MM4 winds as Step 1 field (IWFCOD = 0) 4 = Yes, use MM4 winds as initial guess field (IWFCOD = 1) 5 = Yes, use MM4 winds as observations (IWFCOD = 1) 13 = Yes, use winds from MM5.DAT file as Step 1 field [IWFCOD = 0] 14 = Yes, use winds from MM5.DAT file as initial guess field [IWFCOD = 1] 15 = Yes, use winds from MM5.DAT file as observations [IWFCOD = 1]	14
DGRIDKM	Horizontal spacing of prognostic grid (km)	4.
LVARY	Control variable for use of varying radius of influence. If no stations	F

	with valid data are found within the specified radius of influence, then the closest station with valid data will be used. (T=use, F=do not use.)	
RMAX1	Maximum radius of influence over land in the surface layer (km). This parameter should reflect the limiting influence of terrain features on the interpolation at this level.	100.
RMAX2	Maximum radius of influence over land in layers aloft (km). RMAX2 is generally larger than RMAX1 because the effects of terrain decrease with height.	200.
RMAX3	Maximum radius of influence overwater (km). RMAX3 is used for all layers overwater. It must be large enough to ensure that all grid points over water are large enough to be within the radius of influence of at least one observation.	100
RMIN	Minimum radius of influence used in the wind field interpolation (km). This parameter should be assigned a small value (e.g., <1 km) to avoid possible divide by zero errors in the inverse-distance-squared weighting scheme.	0.1
RMIN2	Distance (km) from an upper air station within which vertical extrapolation of surface station data will be excluded. Used only if $\lvert \text{IEXTRM} \rvert > 1$.	4.0
TERRAD	Radius of influence of terrain features (km)	10.
R1	Weighting parameter for the diagnostic wind field in the surface layer (km). This parameter controls the relative weighting of the first-guess wind field produced by the diagnostic wind field model and the observations. R1 is the distance from an observational station at which the observation and the first-guess field are equally weighted.	50
R2	Weighting parameter for the diagnostic wind field in the layers aloft (km). R2 is applied in the upper layers in the same manner as R1 is used in the surface layer.	100
RPROG	Weighting parameter (km) for the prognostic wind field data	0.
DIVLIM	Convergence criterion for the divergence minimization procedure	5.0E-6
NITER	Maximum number of iterations for the divergence minimization procedure	50
NSMTH	Number of smoothing passes in each layer. NZ values must be entered.	2,(mxnz-1)*4
NINTR2	Maximum number of stations used in the interpolation of data to a grid point for each layer 1-NZ. This allows only the "NINTR2" closest stations to be included in the interpolation. The effect of increasing NINTR2 is similar to smoothing. NZ values must be entered.	Nz*99
CRITFN	Critical Froude number used in the evaluation of terrain blocking effects	1.0
ALPHA	Empirical parameter controlling the influence of kinematic effects	0.1

FEXTR2	Extrapolation values for layers 2 through NZ (FEXTR2(1) must be entered but is not used). Used only if ABS(IEXTRP) ≥ 3.	NZ*0.0
NBAR	Number of wind field interpolation barriers	0
XBBAR	X coordinate (km) of the beginning of each barrier. "NBAR" values must be entered. (Used only if NBAR > 0.)	-
YBBAR	Y coordinate (km) of the beginning of each barrier. "NBAR" values must be entered. (Used only if NBAR > 0.)	-
XEBAR	X coordinate (km) of the end of each barrier. "NBAR" values must be entered. (Used only if NBAR > 0.)	-
YEBAR	Y coordinate (km) of the end of each barrier. "NBAR" values must be entered. (Used only if NBAR > 0.)	-
IDIOPT1	Control variable for surface temperature input to diagnostic wind field module. (0=compute internally from surface data, 1=read preprocessed values from the file DIAG.DAT.)	0
ISURFT	Surface station number (between 1 and NSSTA) used for the surface temperature for the diagnostic wind field module	1
IDIOPT2	Control variable for domain-averaged temperature lapse rate. (0=compute internally from upper air data, 1=read preprocessed values from the file DIAG.DAT.)	0
IUPT	Upper air station number (between 1 and NUSTA) used to compute the domain-scale temperature lapse rate for the diagnostic wind field module	1
ZUPT	Depth (m) through which the domain-scale temperature lapse rate is computed	200.
IDIOPT3	Control variable for domain-averaged wind components. (0=compute internally from upper air, 1=read preprocessed values from the file DIAG.DAT.)	0
IUPWND	Upper air station number used to compute the domain-scale wind components for the diagnostic wind field module. Either specify one station from 1 to NUSTA or specify -1 indicating the use of $1/r^2$ interpolation to generate a spatially-variable initial guess field.	-1
ZUPWND	Bottom and top of layer through which the domain-scale winds are computed. Units: Meters. (Used only if IDIOPT3=0.) Note: Two values must be entered (e.g., ! ZUPWND=1.0, 2000. !).	1.0, 1000.
IDIOPT4	Control variable for surface wind components. (0=compute internally from surface data, 1=read preprocessed values from the file DIAG.DAT.)	0
IDIOPT5	Control variable for upper air wind components. (0=compute internally	0

	from upper air data, 1=read preprocessed values from the file DIAG.DAT.)	
LLBREZE	Control variable for lake breeze region option. LLBREZE=T, region interpolation is performed. LLBREZE=F, no region interpolation is performed.	F
NBOX	Number of boxes defining region (used only if LLBREZE=T)	-
XG1	1st x-grid line to define box. (Used only if LLBREZE=T.) (One for each box.)	-
XG2	2nd x-grid line to define box. (Used only if LLBREZE=T.) (One for each box.)	-
YG1	1st y-grid line to define box. (Used only if LLBREZE=T.) (One for each box.)	-
YG2	2nd y-grid line to define box. (Used only if LLBREZE=T.) (One for each box.)	-
XBCST	Beginning x coordinate (km) of user defined coastline (straight line). (Used only if LLBREZE=T.) (One for each box.)	-
YBCST	Beginning y coordinate (km) of user defined coastline (straight line). (Used only if LLBREZE=T.) (One for each box.)	-
XECST	Beginning x coordinate (km) of user defined coastline (straight line). (Used only if LLBREZE=T.) (One for each box.)	-
YECST	Beginning y coordinate (km) of user defined coastline (straight line). (Used only if LLBREZE=T.) (One for each box.)	-
NLB	Number of meteorological stations (surface and upper air stations) in a box. (Used only if LLBREZE=T.) (One for each box.)	-
METBXID	Station ids of the meteorological stations within each box (surface stations first, then upper air stations). (Used only if LLBREZE=T.) (One set per box.)	-
CONSTB	Neutral mechanical mixing height constant	1.41
CONSTE	Convective mixing height constant	0.15
CONSTN	Stable mixing height constant	2400.
CONSTW	Overwater mixing height constant	0.16

FCORIOL	Absolute value of coriolis parameter (1/s)	1.E-4
DPTMIN	Minimum potential temperature lapse rate in the stable layer above the current convective mixing height (deg. K/m)	0.001
DZZI	Depth of layer (m) above current convective mixing height in which lapse rate is computed.	200.
ZIMAX	Maximum overland mixing height (m)	3000.
ZIMIN	Minimum overland mixing height (m)	50.
ZIMAXW	Maximum overwater mixing height (m) (Not used if observed overwater mixing heights are used)	3000.
ZIMINW	Minimum overwater mixing height (m) (Not used if observed overwater mixing heights are used)	50.
IAVEZI	Conduct spatial averaging of mixing heights (0=no, 1=yes)	1
MNMDAV	Maximum search distance (in grid cells) in the spatial averaging process. The square box of cells averaged is 2 x MNMDAV in length.	1
HAFANG	Half-angle of upwind-looking cone for spatial averaging (deg.)	30.
ILEVZI	Layer of winds used in upwind averaging of mixing heights. (Must be between 1 and NZ.)	6
IRAD TRADKM	Type of temperature interpolation (1 = 1/radius) (2 = 1/radius^2) Radius of influence for temperature interpolation	1 500.
IAVET	Conduct spatial averaging of temperatures (0 = no; 1 = yes) (Will use MNMDAV and HAFANG)	1
TGDEFB	Default temperature lapse rate (K/m) below mixing height over water	-0.0098
TGDEFA	Default temperature lapse rate (K/m) above mixing height over water	-0.0045
JWAT1, JWAT2	Beginning land use category for temperature interpolation overwater. Range of land use categories associated with major water bodies. Used for overwater temperature interpolation	55, 55
NFLAGP	Method of precipitation interpolation (1 = 1/radius interpolation) (2 = 1/radius^2 interpolation) (3 = 1/radius^2 * exponential function) Method 3 is based on a Thiessen method for non-continuous fields where the exponential function = exponent [-radius^2/SIGMAP^2] and SIGMAP is defined below	2

SIGMAP	If NFLAGP=1 or 2, SIGMAP is the radius of influence for precipitation (km); if NFLAGP=3, SIGMAP is the sigma weighting factor (km); if NFLAGP=3 and SIGMAP=0.0, SIGMAP will be computed internally as half of the minimum distance between any non-zero precipitation station and any zero precipitation station.	100.0
CUTP	Cutoff precipitation rate (mm/hr); values < CUTP are set to 0.0 mm/hr	0.01

Variable	Description	Modeled Value
NSPEC	Total number of species modeled	10
NSE	Number of species emitted	8
METFM	Meteorological data format 1 = CALMET unformatted file (CALMET.DAT) 2 = ISC2 ASCII file (ISCMET.DAT) 3 = AUSPLUME ASCII file (PLMMET.DAT)	1
AVET	Averaging time (minutes) (PG - s_y is adjusted by the equation $(AVET/60.0)^{0.2}$	60.0
MGAUSS	Control variable determining the vertical distribution used in the near field (0 = uniform, 1 = Gaussian)	1
MCTADJ	Terrain adjustment method 0 = no adjustment 1 = ISC-type of terrain adjustment 2 = simple, CALPUFF-type of terrain adjustment 3 = partial plume path adjustment	3
MCTSG	CALPUFF subgrid scale complex terrain module (CTSG) flag (0 = CTSG not modeled, 1 = CTSG modeled)	0
MSLUG	Near-field puffs are modeled as elongated "slugs" ? (0 = no, 1 = yes)	0
MTRANS	Transitional plume rise modeled ? (0 = only final rise computed, 1 = transitional rise computed) Note: Transitional plume rise is always computed for sources subject to building downwash effects.	1
MTIP	Stack tip downwash modeled ? 0 = no (i.e., no stack tip downwash) 1 = yes (i.e., use stack tip downwash)	1
MSHEAR MSPLIT	Vertical wind shear above stack top modeled in plume rise ? (0 = no, 1 = yes) Puff splitting allowed ? (0 = no, 1 = yes)	 0 0
MCHEM	Chemical mechanism flag. 0 = chemical transformation not modeled 1 = transformation rates computed internally (MESOPUFF II scheme) 2 = user specified transformation rates used (If MCHEM = 2, the user must prepare a file (CHEM.DAT) with a diurnal cycle of transformation rates)	1
MWET	Wet removal modeled ? (0 = no, 1 = yes)	1

MDRY	Dry deposition modeled ? (0 = no, 1 = yes) Note: The method used to determine dry deposition velocities is specified by the user on a species-by-species basis in Input Group 3.	1
MDISP	Method used to compute the horizontal and vertical dispersion coefficients 4 = same as 3 except PG coefficients computed using the MESOPUFF II equations	3
MROUGH	PG s_y and s_z adjusted for surface roughness ? (0 = no, 1 = yes)	0
MPARTL	Partial plume penetration of elevated inversion? (0 = no, 1 = yes)	1
MREG	Test options in control file to see if they conform to regulatory values? (0 = no, 1 = yes (US EPA), 2 = yes (USA visibility application), 3 = yes (Victorian EPA)	1
NSPLIT	Number of puffs that result every time a puff is split.	3

Listings of Surface Meteorological Stations

NAME	WBAN	LATITUDE	LONGITUDE
GRANT, OR	726876	44.4	-118.967
PENDLETON, OR	726880	45.698	-118.855
HERMISTON, OR	726883	45.826	-119.261
LA GRANDE, OR	726884	45.283	-118.000
MEACHAM, OR	726885	45.511	-118.425
BAKER, OR	726886	44.843	-117.809
COLUMBIA RIVER GORGE	726988	45.619	-121.166
YAKIMA, WA	727810	46.568	-120.543
EPHRATA, WA	727826	47.308	-119.515
MOSES,WA	727827	47.208	-119.319
LEWISTON, ID	727830	46.375	-117.016
HANFORD, WA	727840	46.567	-119.600
TRI CITIES,WA	727845	46.267	-119.117
WALLA WALLA,WA	727846	46.095	-118.287
PULLMAN,WA	727857	46.744	-117.109
BOWERS,WA	727883	47.034	-120.530
JOHN DAY, OR	999999	44.556	-119.646

Listing of Precipitation Stations

COOP ID	NAME	Latitude	Longitude
350265	ARLINGTON OR US	45.721	-120.206
350356	AUSTIN 3 S OR US	44.575	-118.491
350412	BAKER CITY MUNICIPAL AIRPORT OR US	44.843	-117.809
350571	BEAR SPRINGS RANGER STATION OR US	45.127	-121.533
351765	CONDON OR US	45.233	-120.181
452030	DAYTON 1 WSW WA US	46.316	-118.001
452505	ELLENSBURG WA US	46.969	-120.540
352672	ENTERPRISE R S OR US	45.426	-117.297
452614	EPHRATA MUNICIPAL AIRPORT WA US	47.304	-119.514
453183	GLENWOOD WA US	46.008	-121.262
354402	GOVERNMENT CAMP OR US	45.301	-121.742
353830	HEPPNER 5 SSE OR US	45.290	-119.527
354008	HOOD RIVER TUCKER BRIDGE OR US	45.655	-121.549
354147	IMNAHA OR US	45.562	-116.833
454154	KENNEWICK WA US	46.211	-119.101
354622	LA GRANDE OR US	45.317	-118.075
454679	LIND 3 NE WA US	46.998	-118.571
355734	MORO OR US	45.483	-120.724
455659	MOUNT ADAMS RANGER STATION WA US	46.000	-121.540
455731	NACHES 10 NW WA US	46.867	-120.775
356546	PENDLETON E OR REGIONAL AIRPORT OR US	45.698	-118.855
356636	PILOT ROCK 11 E OR US	45.500	-118.616
356845	PRAIRIE CITY RANGER STATION OR US	44.462	-118.714
456789	PULLMAN 2 NW WA US	46.756	-117.191
457342	SATUS PASS 2 SSW WA US	45.948	-120.667
358000	SPOUT SPRINGS SKI LO OR US	45.755	-118.049
458207	SUNNYSIDE WA US	46.324	-120.010
358717	TYGH VALLEY OR US	45.246	-121.170
358726	UKIAH OR US	45.136	-118.934
358985	WALLA WALLA 13 ESE OR US	45.992	-118.051
459082	WENATCHEE PANGBORN AIRPORT WA US	47.398	-120.201
359213	WESTON OR US	45.821	-118.430
459200	WHITMAN MISSION WA US	46.044	-118.463
459465	YAKIMA AIR TERMINAL WA US	46.568	-120.543

	UPPER AIR STATIONS		
SITE	ID	LATITUDE	LONGITUDE
SALEM,OR	72694	44.92	-123.02
MEDFORD,OR	72597	42.37	-122.37
SPOKANE, WA	72786	47.68	-117.63
BOISE,ID	72681	43.57	-116.22

Table A-1 **PWC AERMOD Turbine Screening Results**

Regular 20/100/200/500-meter Receptor Grids and 10m Fenceline Receptors

90' Stack Heights

Case#	100	101	102	103	104	105	106	107	108
Case in AERMOD	A	B	C	D	E	F	G	H	I
Load (%)	100	75	50	100	75	50	100	75	50
Conditioning	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Ambient Temp, °F	17	17	17	26	26	26	53	53	53
Stack Exit Temp (deg.F)	754.4	754.8	794.8	756.5	758.5	797.3	779.1	768.5	804.0
Volumetric Flowrate ACFM	931,016	796,160	660,470	932,093	797,212	661,416	942,007	803,813	665,539
Stack Velocity (fps)	68.36	58.46	48.50	68.44	58.54	48.57	69.17	59.02	48.87
Stack Inside Diameter (ft)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Stack Height (m)	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432
Stack Exit Temp (deg.K)	674.48	674.71	696.93	675.65	676.76	698.32	688.21	682.32	702.04
Stack Exit Velocity (m/s)	20.84	17.82	14.78	20.86	17.84	14.80	21.08	17.99	14.90
Stack Inside Diameter (m)	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816
Normal Operations - Short-term Emissions (lb/hr)									
NOx (lb/hr/turbine)	8.30	6.61	5.01	8.31	6.63	5.03	8.48	6.73	5.09
CO (lb/hr/turbine)	12.13	9.66	7.31	12.15	9.68	7.35	12.41	9.84	7.43
SO2 (lb/hr@1gr/100scf)	2.565	2.045	1.550	2.569	2.051	1.555	2.621	2.080	1.574
SO2 (lb/hr@0.2142gr/100scf)	0.549	0.438	0.332	0.550	0.439	0.333	0.561	0.446	0.337
PM (lb/hr/turbine)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Normal Operations - Unitized Impacts (ug/m3 for 1.0 g/s/turbine)									
1-Hr Unitized Conc (ug/m3)	8.41171	10.17668	12.35032	8.39487	10.14802	12.32295	8.21316	10.00575	12.20980
X(m)	316440.0	316400.0	316380.0	316440.0	316400.0	316380.0	316440.0	316400.0	316380.0
Y(m)	5074880.0	5074840.0	5074820.0	5074880.0	5074840.0	5074820.0	5074880.0	5074840.0	5074820.0
Z(m)	166.2	166.9	167.2	166.2	166.9	167.2	166.2	166.9	167.2
YYMMDDHH	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721
3-Hr Unitized Conc (ug/m3)	6.03939	7.58045	9.62362	6.02272	7.55488	9.59510	5.83591	7.43187	9.47895
X(m)	316540.0	316520.0	316460.0	316540.0	316520.0	316460.0	316540.0	316520.0	316460.0
Y(m)	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0
Z(m)	164.8	165.3	166.5	164.8	165.3	166.5	164.8	165.3	166.5
YYMMDDHH	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703
8-Hr Unitized Conc (ug/m3)	4.58432	5.82204	7.45417	4.57184	5.80175	7.43304	4.43835	5.70324	7.34418
X(m)	316560.0	316520.0	316480.0	316560.0	316520.0	316480.0	316560.0	316520.0	316480.0
Y(m)	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0
Z(m)	164.3	165.3	166.3	164.3	165.3	166.3	164.3	165.3	166.3
YYMMDDHH	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708
24-Hr Unitized Conc (ug/m3)	2.07298	2.63462	3.31039	2.06789	2.62467	3.30084	2.01365	2.57821	3.26254
X(m)	316900.0	316800.0	316760.0	316900.0	316800.0	316760.0	316900.0	316800.0	316760.0
Y(m)	5075100.0	5075040.0	5075000.0	5075100.0	5075040.0	5075000.0	5075100.0	5075040.0	5075000.0
Z(m)	167.6	166.3	163.7	167.6	166.3	163.7	167.6	166.3	163.7
YYMMDDHH	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224
Normal Operations - Short-term Screening Emissions (g/s/turbine)									
NOx (g/s/turbine)	1.0458	0.8329	0.6313	1.0471	0.8354	0.6338	1.0685	0.8480	0.6413
CO (g/s/turbine)	1.5284	1.2172	0.9211	1.5309	1.2197	0.9261	1.5637	1.2398	0.9362
SO2 (g/s/turbine)	0.3232	0.2577	0.1953	0.3237	0.2584	0.1959	0.3302	0.2621	0.1983
PM10 (g/s/turbine)	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560
Normal Operations - Short-term Screening Impacts (ug/m3)									
1-Hour NOx (ug/m3)	**8.797**	8.476	7.797	8.790	8.478	7.810	8.776	8.485	7.830
1-Hour CO (ug/m3)	**12.856**	12.387	11.376	12.852	12.378	11.412	12.843	12.405	11.431
8-Hour CO (ug/m3)	7.007	**7.087**	6.866	6.999	7.076	6.884	6.940	7.071	6.876
1-Hour SO2 (ug/m3)	**2.719**	2.623	2.412	2.717	2.622	2.414	2.712	2.623	2.421
3-Hour SO2 (ug/m3)	1.952	**1.953**	1.879	1.950	1.952	1.880	1.927	1.948	1.880
24-Hour PM10 (ug/m3)	1.567	1.992	2.503	1.563	1.984	2.495	1.522	1.949	2.466

Worst-Case Operating Scenarios are **bolded**.

Table A-1 PWC AERMOD Turbine Screening Results

Regular 20/100/200/500-meter Receptor Grids and 10m Fenceline Receptors

90' Stack Heights

Case#	109	110	111	112	113	114	115	116	117	118	119	120
Case in AERMOD	J	K	L	M	N	O	P	Q	R	S	T	U
Load (%)	100	75	50	100	75	50	100	75	50	100	75	50
Conditioning	EVAP	EVAP	EVAP	EVAP	EVAP	EVAP	NONE	NONE	NONE	NONE	NONE	NONE
Ambient Temp, °F	79	79	79	97	97	97	79	79	79	97	97	97
Stack Exit Temp (deg.F)	799.3	773.8	805.9	803.5	778.0	809.4	804.5	780.8	813.7	812.7	791.6	823.7
Volumetric Flowrate ACFM	946,297	805,932	666,824	937,206	797,598	660,676	935,933	797,673	660,647	915,740	782,238	648,624
Stack Velocity (fps)	69.48	59.18	48.96	68.82	58.57	48.51	68.72	58.57	48.51	67.24	57.44	47.63
Stack Inside Diameter (ft)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Stack Height (m)	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432	27.432
Stack Exit Temp (deg.K)	699.43	685.26	703.09	701.76	687.59	705.04	702.32	689.15	707.43	706.87	695.15	712.98
Stack Exit Velocity (m/s)	21.18	18.04	14.92	20.98	17.85	14.79	20.95	17.85	14.79	20.49	17.51	14.52
Stack Inside Diameter (m)	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816	5.1816
Normal Operations - Short-term Emissions (lb/hr)												
NOx (lb/hr/turbine)	8.57	6.76	5.10	8.46	6.67	5.03	8.45	6.67	5.04	8.21	6.50	4.93
CO (lb/hr/turbine)	12.52	9.87	7.46	12.36	9.73	7.36	12.34	9.74	7.37	12.00	9.49	7.21
SO2 (lb/hr@1gr/100scf)	2.648	2.090	1.577	2.615	2.060	1.557	2.610	2.063	1.559	2.537	2.011	1.524
SO2 (lb/hr@0.2142gr/100scf)	0.567	0.448	0.338	0.560	0.441	0.334	0.559	0.442	0.334	0.543	0.431	0.326
PM (lb/hr/turbine)	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
Normal Operations - Unitized Impacts (ug/m3 for 1.0 g/s/turbine)												
1-Hr Unitized Conc (ug/m3)	8.10008	9.95018	12.18501	8.18427	10.06327	12.28334	8.19578	10.05228	12.26643	8.39648	10.24346	12.46252
X(m)	316440.0	316400.0	316380.0	316440.0	316400.0	316380.0	316440.0	316400.0	316380.0	316440.0	316400.0	316380.0
Y(m)	5074880.0	5074840.0	5074820.0	5074880.0	5074840.0	5074820.0	5074880.0	5074840.0	5074820.0	5074880.0	5074840.0	5074820.0
Z(m)	166.2	166.9	167.2	166.2	166.9	167.2	166.2	166.9	167.2	166.2	166.9	167.2
YYMMDDHH	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721	98122721
3-Hr Unitized Conc (ug/m3)	5.71931	7.38381	9.45333	5.79857	7.47575	9.54981	5.80930	7.46540	9.53091	6.00241	7.62079	9.72216
X(m)	316540.0	316520.0	316460.0	316540.0	316520.0	316460.0	316540.0	316520.0	316460.0	316540.0	316520.0	316460.0
Y(m)	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0
Z(m)	164.8	165.3	166.5	164.8	165.3	166.5	164.8	165.3	166.5	164.8	165.3	166.5
YYMMDDHH	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703	99070703
8-Hr Unitized Conc (ug/m3)	4.35538	5.66518	7.32469	4.41461	5.74051	7.40014	4.42267	5.73256	7.38623	4.56507	5.86129	7.54176
X(m)	316560.0	316520.0	316480.0	316560.0	316520.0	316480.0	316560.0	316520.0	316480.0	316560.0	316520.0	316460.0
Y(m)	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0	5074880.0	5074860.0	5074820.0
Z(m)	164.3	165.3	166.3	164.3	165.3	166.3	164.3	165.3	166.3	164.3	165.3	166.5
YYMMDDHH	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708	99070708
24-Hr Unitized Conc (ug/m3)	1.97855	2.55994	3.25406	1.99759	2.59310	3.28464	2.00012	2.58896	3.27801	2.04808	2.64542	3.34579
X(m)	316900.0	316800.0	316760.0	316900.0	316800.0	316760.0	316900.0	316800.0	316760.0	316900.0	316800.0	316480.0
Y(m)	5075100.0	5075040.0	5075000.0	5075100.0	5075040.0	5075000.0	5075100.0	5075040.0	5075000.0	5075100.0	5075040.0	5074780.0
Z(m)	167.6	166.3	163.7	167.6	166.3	163.7	167.6	166.3	163.7	167.6	166.3	166.6
YYMMDDHH	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224	98052224	99070724
Normal Operations - Short-term Screening Emissions (g/s/turbine)												
NOx (g/s/turbine)	1.0798	0.8518	0.6426	1.0660	0.8404	0.6338	1.0647	0.8404	0.6350	1.0345	0.8190	0.6212
CO (g/s/turbine)	1.5775	1.2436	0.9400	1.5574	1.2260	0.9274	1.5548	1.2272	0.9286	1.5120	1.1957	0.9085
SO2 (g/s/turbine)	0.3336	0.2633	0.1987	0.3295	0.2596	0.1962	0.3289	0.2599	0.1964	0.3197	0.2534	0.1920
PM10 (g/s/turbine)	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560	0.7560
Normal Operations - Short-term Screening Impacts (ug/m3)												
1-Hour NOx (ug/m3)	8.746	8.476	7.830	8.724	8.457	7.785	8.726	8.448	7.789	8.686	8.389	7.742
1-Hour CO (ug/m3)	12.778	12.374	11.454	12.746	12.338	11.392	12.743	12.336	11.391	12.695	12.248	11.322
8-Hour CO (ug/m3)	6.871	7.045	6.885	6.875	7.038	6.863	6.876	7.035	6.859	6.902	7.008	6.852
1-Hour SO2 (ug/m3)	2.702	2.620	2.421	2.697	2.612	2.410	2.696	2.613	2.409	2.684	2.596	2.393
3-Hour SO2 (ug/m3)	1.908	1.944	1.878	1.911	1.941	1.874	1.911	1.940	1.872	1.919	1.931	1.867
24-Hour PM10 (ug/m3)	1.496	1.935	2.460	1.510	1.960	2.483	1.512	1.957	2.478	1.548	2.000	**2.529**

Worst-Case Operating Scenarios are **bolded**.

Wind Chaser AERMOD Engine Screening

Regular Fenceline/Receptor Grids

Engine	EG	FP	CT1-4
Case in AERMOD	EMER	FIRE	COOL
Fuel Consumption (gal/hr)	36.6	18.8	N/A
Minutes/Daily Test	60	60	N/A
Hours/year	100	100	N/A
Engine Size (kW/hr)	500	280	N/A
Stack Exit Temp (deg.F)	942.1	842	103.83
Volumetric Flowrate ACFM	3,842.2	1,867	940,136
Stack Velocity (fps)	326.14	158.48	27.367
Stack Inside Diameter (ft)	0.5	0.5	27.0
Stack Height (m)	6.096	7.620	12.119
Stack Exit Temp (deg.K)	778.76	723.15	313.06
Stack Exit Velocity (m/s)	99.41	48.30	8.34
Stack Inside Diameter (m)	0.1524	0.1524	8.2296
Emissions			
NOx (g/kW)	3.9	3.9	N/A
CO (g/kW)	3.5	3.5	N/A
SO2 (lb/hr)*	0.00758	0.00389	N/A
PM (g/kW)	0.2	0.2	0.175 lb/hr
Unitized Impacts (ug/m3 for 1.0 g/s)			
1-Hr Unitized Conc (ug/m3)	266.09872	466.02652	
X(m)	316180.0	315989.4	
Y(m)	5074380.0	5074502.4	
Z(m)	169.3	169.6	
YYMMDDHH	98121608	95071721	
3-Hr Unitized Conc (ug/m3)	188.87269	379.82917	
X(m)	316058.0	315950.1	
Y(m)	5074502.4	5074502.4	
Z(m)	169.6	169.8	
YYMMDDHH	98122003	99040521	
8-Hr Unitized Conc (ug/m3)	150.59335	291.19759	
X(m)	316060.0	315963.3	
Y(m)	5074500.0	5074656.1	
Z(m)	169.6	169.7	
YYMMDDHH	98122008	96091724	
24-Hr Unitized Conc (ug/m3)	72.10260	177.44805	
X(m)	316040.0	315871.7	
Y(m)	5074480.0	5074502.4	
Z(m)	169.6	170.2	
YYMMDDHH	95021224	97011224	
Screening Emissions (g/s)			
1-Hour NOx (g/s)	0.5417	0.3033	N/A
Annual NOx (g/s)	6.18E-3	3.46E-3	N/A
1-Hour CO (g/s)	0.4861	0.2722	N/A
8-hour CO (g/s)	0.0608	0.0340	N/A
1-Hour SO2 (g/s)	9.55E-4	4.90E-4	N/A
3-hour SO2 (g/s)	3.18E-4	1.63E-4	N/A
1-Hour PM (g/s)	0.02778	0.01556	N/A
24-hour PM (g/s)	1.16E-3	6.48E-4	0.0220
Annual PM (g/s)	3.17E-4	1.78E-4	N/A
Screening Impacts (ug/m3)			
1-Hour NOx (ug/m3)	**144.146**	141.346	N/A
1-Hour NO2 (ug/m3)	**115.317**	113.077	N/A
1-Hour CO (ug/m3)	**129.351**	126.852	N/A
8-Hour CO (ug/m3)	9.156	**9.901**	N/A
1-Hour SO2 (ug/m3)	**0.254**	0.228	N/A
3-Hour SO2 (ug/m3)	0.060	**0.062**	N/A
24-Hour PM (ug/m3)	0.084	**0.115**	N/A

*SO2 emissions based on:			
Ultra-low Diesel (ppm)	15	15	
Fuel Density (lb/gal)	6.9	6.9	
1-Hr Ambient Ratio Method	80%	80%	

Table A-2
Emission Rates and Stack Parameters for Modeling

	Stack Height meters	Temp, deg K	Exhaust Velocity, m/s	Stack Diam, m	Emission Rates, g/s				Emission Rates, lb/hr			
					NOx	CO	SO2	PM10	NOx	CO	SO2	PM10
Averaging Period: One hour-Normal												
CTG #1	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	8.30	12.13	2.565	-
CTG #2	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	8.30	12.13	2.565	-
CTG #3	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	8.30	12.13	2.565	-
CTG #4	27.432	674.48	20.84	5.1816	1.0458	1.5284	0.3232	-	8.30	12.13	2.565	-
Em Generator (1 engine run)	6.096	778.76	99.41	0.1524	0.5417	0.4861	9.55E-4	-	-	-	-	-
Fire Pump (1 engine run)	7.620	723.15	48.30	0.1524	0.3033	0.2722	4.90E-4	-	-	-	-	-
Averaging Period: One hour-One Startup												
CTG #1	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	35.57	94.39	-	-
CTG #2	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	35.57	94.39	-	-
CTG #3	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	35.57	94.39	-	-
CTG #4	27.432	674.48	20.84	5.1816	4.4818	11.8931	-	-	35.57	94.39	-	-
Averaging Period: Three hours-Normal												
CTG #1	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-	-	2.045	-
CTG #2	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-	-	2.045	-
CTG #3	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-	-	2.045	-
CTG #4	27.432	674.71	17.82	5.1816	-	-	0.2577	-	-	-	2.045	-
Em Generator (1 engine run)	6.096	778.76	99.41	0.1524	-	-	3.18E-4	-	-	-	-	-
Fire Pump (1 engine run)	7.620	723.15	48.30	0.1524	-	-	1.63E-4	-	-	-	-	-
Averaging Period: Eight hours-Normal												
CTG #1	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-	9.66	-	-
CTG #2	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-	9.66	-	-
CTG #3	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-	9.66	-	-
CTG #4	27.432	674.71	17.82	5.1816	-	1.2172	-	-	-	9.66	-	-
Em Generator (1 engine run)	6.096	778.76	99.41	0.1524	-	0.0608	-	-	-	-	-	-
Fire Pump (1 engine run)	7.620	723.15	48.30	0.1524	-	0.0340	-	-	-	-	-	-
Averaging Period: Eight hours-Two Startups & Two Shutdowns												
CTG #1	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-	36.08	-	-
CTG #2	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-	36.08	-	-
CTG #3	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-	36.08	-	-
CTG #4	27.432	674.71	17.82	5.1816	-	4.5461	-	-	-	36.08	-	-
Em Generator (1 engine run)	6.096	778.76	99.41	0.1524	-	0.0608	-	-	-	-	-	-
Fire Pump (1 engine run)	7.620	723.15	48.30	0.1524	-	0.0340	-	-	-	-	-	-
Averaging Period: 24 hours-Normal												
CTG #1	27.432	712.98	14.52	5.1816	-	-	-	0.7560	-	-	-	6.00
CTG #2	27.432	712.98	14.52	5.1816	-	-	-	0.7560	-	-	-	6.00
CTG #3	27.432	712.98	14.52	5.1816	-	-	-	0.7560	-	-	-	6.00
CTG #4	27.432	712.98	14.52	5.1816	-	-	-	0.7560	-	-	-	6.00
Em Generator (1 engine run)	6.096	778.76	99.41	0.1524	-	-	-	1.16E-3	-	-	-	-
Fire Pump (1 engine run)	7.620	723.15	48.30	0.1524	-	-	-	6.48E-4	-	-	-	-
Cooling Tower (each cell of 4)	12.119	313.06	8.34	8.2296	-	-	-	0.0221	-	-	-	0.175
Averaging Period: Annual=4400 hours(Case106/G) + 500 Startups + 500 Shutdowns												
CTG #1	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	6.27	-	-	3.24
CTG #2	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	6.27	-	-	3.24
CTG #3	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	6.27	-	-	3.24
CTG #4	27.432	688.21	21.08	5.1816	0.7900	-	-	0.4087	6.27	-	-	3.24
Em Generator (100 hours)	6.096	778.76	99.41	0.1524	6.18E-3	-	-	3.17E-4	-	-	-	-
Fire Pump (100 hours)	7.620	723.15	48.30	0.1524	3.46E-3	-	-	1.78E-4	-	-	-	-
Cooling Tower (each cell of 4)	12.119	313.06	8.34	8.2296	-	-	-	0.0119	-	-	-	0.095

Assumptions for Normal Operations:

Emergency generator & firepump operate up to 60 mins/day and 100 hrs/yr Testing assumed not to occur for both the emergency generator and firepump during the same hour.

Cooling Tower operates up to 24 hours/day and 4736 hrs/yr

Turbine operates up to 24 hours/day for all cases and pollutants under normal operations.

Annual NOx, SOx, PM: 4400 hours base load, 500 startups (250 hrs), and 500 shutdowns (86 hrs) for 336 hours in startup/shutdown and a total of 4736 hours.

Start-up Conditions

Fire pump or EG not tested during 1 hour start cycle

CO 8-hour start-up emissions calculated as two startups + two shutdowns + rest base load

Short term SO2 based on 1 grain S/scf, annual based on 0.2142 grain S/scf

Startup/Shutdown Emissions			Emission Rates, lb/event			
SafetyFactor	Event	Duration	NOx	CO	SO2	PM10
100%	Startup	30 mins	31.28	88.13	N/A	N/A
110%	Shutdown	10.32 mins	3.97	13.21	N/A	N/A
100%	1-hr Normal	60 mins	8.57	12.52	N/A	N/A
100%	8-hr Normal	60 mins	N/A	12.52	N/A	N/A
100%	Ann Normal	60 mins	8.48	N/A	N/A	6.00
Startup/Shutdown Emission Calcs			Emission Rates, lb/hr/turbine			
Avg.Time	Event	Duration	NOx	CO	SO2	PM10
1-hour	Normal	30 mins	4.285	6.260	N/A	N/A
1-start	Startup	30 mins	31.280	88.130	N/A	N/A
0-stop	Shutdown	0 mins	0.000	0.000	N/A	N/A
		Total	35.57	94.39	N/A	N/A
8-hour	Normal	399.36 mins	N/A	10.417	N/A	N/A
2-start	Startup	60 mins	N/A	22.033	N/A	N/A
2-stop	Shutdown	20.64 mins	N/A	3.633	N/A	N/A
No Safety Factors w/Ann		Total	N/A	36.08	N/A	N/A
8760-hour	Normal	4400 hrs	4.26	N/A	N/A	N/A
500-start	Startup	250 hrs	1.79	N/A	N/A	N/A
500-stop	Shutdown	86 hrs	0.23	N/A	N/A	N/A
		Total	6.27	N/A	N/A	3.24

Sample Turbine Emissions Calculations
For Modeling Start-up/Shutdown Events

1-Hour NOx Start-up Emissions (one 30-minute Start-Up):

Start-up:	= 62.56 lb/hr for 30 minutes
Normal:	= 8.57 lb/hr for 30 minutes

62.56 lb/hr x (30/60) + 8.57 lb/hr x (30/60) = 35.57 lb/hr

1-Hour CO Start-up Emissions (one 30-minute Start-Up):

Start-up:	= 176.26 lb/hr for 30 minutes
Normal:	= 12.52 lb/hr for 30 minutes

176.26 lb/hr x (30/60) + 12.52 lb/hr x (30/60) = 94.39 lb/hr

8-Hour CO Start-up/Shutdown Emissions (two 30-minute Start-Ups and two 10.32-minute Shutdowns)

Start-up:	= 176.26 lb/hr for 60 minutes
Shutdown:	= 84.48 lb/hr for 20.64 minutes
Normal:	= 12.52 lb/hr for 399.36 minutes

176.26 lb/hr x (60/480) + 84.48 lb/hr x (20.64/480) + 12.52 lb/hr x (399.36/480) = 36.08 lb/hr

All other emissions (short-term SO2 and PM and annual emissions) are as shown in Section 3.2 of the main section of the permit application.

Windchaser Competing Source List

Windchaser Location 315940 5074790

Source Number	Source Name	Source Address	City	Zip	County	utm e m	utm n m	Distance from WC (km)	PSELs NOX (tpy)	PSELs PM10 (tpy)	PSELs PM25 (tpy)	Actual Emissions NOX (tpy)	Actual Emissions PM10 (tpy)	Actual Emissions PM2.5 (tpy)	Permit Program	Permit Number	SEQ ID	Comments
25-0002	Oregon Potato Company	650 EAST COLUMBIA	BOARDMAN	97818	MORROW	291907	5080375	25	39	14	9	44.8	4.0	4.0	ACDP	25-0002-SI-01	2	
25-0016	Portland General Electric Company	CARTY RESERVOIR POWER SITE, TOWER ROAD	BOARDMAN	97818	MORROW	281586	5063866	36	11672	1056	---	4049.2	683.3	284.2	TV	25-0016-TV-01	26	
25-0027	ConAgra Foods Lamb Weston, Inc.	750 NE COLUMBIA AVENUE	BOARDMAN	97818	MORROW	292345	5080238	24	39	14	9	1.6	8.6	8.6	ACDP	25-0027-SI-01	4	
25-0031	Portland General Electric Company	200 ULLMAN BLVD	BOARDMAN	97818	MORROW	292406	5080647	24	287	48	---	79.9	13.8	13.8	TV	25-0031-TV-01	5	
25-0032	ConAgra Foods Lamb Weston, Inc.	600 NE COLUMBIA AVE	BOARDMAN	97818	MORROW	291710	5080292	25	45	22	---	36.9	20.8	20.8	ACDP	25-0032-ST-01	6	
30-0062	J-M Pipe Company, Inc.	31240 ROXBURY RD	UMATILLA	97882	UMATILLA	323828	5088169	16	---	14	9	---	1.2	1.2	ACDP	30-0062-SI-01	17	
30-0075	ConAgra Foods Lamb Weston, Inc.	78153 WESTLAND RD	HERMISTON	97838	UMATILLA	316102	5075173	0	80	31	---	28.4	30.7	30.7	ACDP	30-0075-ST-01	18	
30-0113	Hermiston Generating Company, L.P.	78145 WESTLAND RD.	HERMISTON	97838	UMATILLA	315817	5075025	0	272	64	---	140.4	40.9	39.9	TV	30-0113-TV-01	21	
30-0114	Hermiston Foods Inc.	2250 S HIGHWAY 395	HERMISTON	97838	UMATILLA	324179	5076173	8	39	14	---	2.1	0.1	0.1	ACDP	30-0114-11-01	22	
30-0118	Hermiston Power LLC	78910 SIMPLOT ROAD	HERMISTON	97838	UMATILLA	320227	5073706	4	315	120	---	67.9	28.3	28.3	TV	30-0118-TV-01	23	
30-9503	Pioneer Hi-Bred International, Inc.	2212 SE 9TH ST.	HERMISTON	97838	UMATILLA	323169	5076468	7	39	14	---	1.3	1.1	0.3	ACDP	30-9503-SI-01	25	
												4452.5	**832.8**	**431.9**				

Note: 25-0044: Upper Columbia Mill, LLC has not reported emissions data for the past 2yrs

Windchaser Competing Source Emissions Inventory						*Actual Emissions*			*Stack Parameters*								
Report Year	Source Number	Emission Source Code	Process Code	SCC	Emission Source Description	NOX (tpy)	PM10 (tpy)	PM2.5 (tpy)	Stack Code	Stack Description	Height (ft)	Diameter (ft)	Exit Gas Temperature (°F)	Exit Gas Velocity (ft/sec)	Exit Gas Flow Rate (ft^3/min)	Latitude	Longitude
2012	25-0002	EU1	P-1	10200602	Boiler	44.8	1.1	1.1	STK-1	PSD Default Parameters	185	13	317	9	67645	45.8455	-119.6799
2012	25-0002	EU2	P-1	30201407	Storage Silo Baghouses	---	2.9	2.9	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8455	-119.6799
2012	25-0002	EU3	P-1	30201408	Bulk Railcar Loadout	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8455	-119.6799
2011	25-0016	FS-1	P-1	30501014	Fugitive emissions	0.6	26.8	---	RP-FS	TRAACS default parameters	20	50	72	7	824668	45.6940	-119.8008
2011	25-0016	PS-1	P-1	10100222	Main boiler	4048.0	656.0	283.9	STK-1	---	656	23	302	95	2266364	45.6938	-119.8053
2011	25-0016	PS-1	P-2	10100501	Main boiler	---	0.4	0.3	STK-1	---	656	23	302	95	2266364	45.6938	-119.8053
2011	25-0016	PS-2	P-1	10200501	Auxilliary boiler	0.6	0.1	0.0	STK-2	---	74	4	416	29	19938	45.6939	-119.8070
2012	25-0027	EU1	P-2	30290003	Dryer	1.6	---	---	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8443	-119.6742
2012	25-0027	EU1	P-1	30201412	Dryer	---	2.8	2.8	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8443	-119.6742
2012	25-0027	EU2	P-1	30203602	Fryer	---	5.8	5.8	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8443	-119.6742
2011	25-0031	FS-1	P-1	28888801	Aggregate insignificant emissions	1.0	1.0	1.0	RP-FS	TRAACS default parameters	20	50	72	7	824668	45.8480	-119.6737
2011	25-0031	PS-1	P-1	20100201	Combustion turbine 1	35.9	5.9	5.9	STK-1	---	57	12	734	62	384523	45.8486	-119.6729
2011	25-0031	PS-1	P-2	20100101	Combustion turbine 1	---	0.0	0.0	STK-1	---	57	12	734	62	384523	45.8486	-119.6729
2011	25-0031	PS-2	P-1	20100201	Combustion turbine 2	35.9	6.1	6.1	STK-2	---	65	11	650	62	379089	45.8486	-119.6742
2011	25-0031	PS-3	P-1	10200601	Auxiliary boiler	7.1	0.8	0.8	STK-3	---	109	7	387	37	72870	45.8485	-119.6746
2012	25-0032	EU1	P-1	10200602	Boilers 1 & 2	34.9	0.9	0.9	STK-1	PSD Default Parameters	185	13	317	9	67645	45.8446	-119.6825
2012	25-0032	EU2	P-1	30201412	Dryers	2.0	0.8	0.8	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8446	-119.6825
2012	25-0032	EU3	P-1	30203602	Line 1/3 Fryer	---	3.7	3.7	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8446	-119.6825
2012	25-0032	EU4	P-1	30203602	Line 2 Fryer	---	2.6	2.6	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8446	-119.6825
2012	25-0032	EU5	P-1	30203602	Line 4 Fryer	---	12.8	12.8	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8446	-119.6825
2012	30-0062	EU1	P-1	64633001	Regrind Mill	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.9244	-119.2720
2012	30-0062	EU2	P-1	64633001	Mixing Area	---	0.6	0.6	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.9244	-119.2720
2012	30-0062	EU3	P-1	64633001	Storage Silos	---	0.6	0.6	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.9246	-119.2712
2012	30-0075	EU1	P-1	10200602	Boilers	26.7	0.7	0.7	STK-1	PSD Default Parameters	185	13	317	9	67645	45.8054	-119.3661
2012	30-0075	EU2	P-1	30290003	Dryer	1.4	0.1	0.1	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8056	-119.3666
2012	30-0075	EU2	P-2	30201412	Dryer	---	4.4	4.4	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8056	-119.3666
2012	30-0075	EU3	P-1	30290003	Oven	0.3	0.0	0.0	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8056	-119.3666
2012	30-0075	EU4	P-1	30203602	Fryer 1	---	18.3	18.3	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8056	-119.3666
2012	30-0075	EU5	P-1	30203602	Fryers 2,3,5	---	7.3	7.3	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8056	-119.3666
2011	30-0113	GS-1	P-1	30700821	aggregate insignificant emissions	1.0	1.0	---	RP-GS	TRAACS default parameters	40	5	72	40	47100	45.8041	-119.3703
2011	30-0113	PS-1	P-1	20100201	Combustion turbine #1	72.7	19.9	19.9	STK-1	---	65	11	650	62	379089	45.8044	-119.3703
2011	30-0113	PS-2	P-1	20100201	Combustion turbine #2	66.7	20.0	20.0	STK-2	---	65	11	650	62	379089	45.8038	-119.3703
2011	30-0114	EU1	P-1	10200602	Boiler	2.1	0.1	0.1	STK-1	PSD Default Parameters	185	13	317	9	67645	45.8167	-119.2632
2011	30-0118	FS-1	P-1	28888801	Aggregate Insignificant	1.0	1.0	1.0	RP-FS	TRAACS default parameters	20	50	72	7	824668	45.7935	-119.3131
2011	30-0118	PS-1	P-1	20100209	Combustion turbine CTG1	34.5	14.1	14.1	STK-1	Combustion turbine 1 stack	36	9	617	76	265927	45.7935	-119.3135
2011	30-0118	PS-2	P-1	20100209	Combustion turbine CTG2	32.4	13.2	13.2	STK-2	Combustion turbine 2 stack	36	9	617	76	265927	45.7933	-119.3136
2011	30-9503	EU1	P-1	30200527	Slimmer Dryers	1.3	0.1	0.1	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8191	-119.2763
2011	30-9503	EU10	P-1	30200560	Bees Wing Loadout	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU11	P-1	30200540	Bulk Storage Bins	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8186	-119.2775
2011	30-9503	EU12	P-1	30200560	Bulk Truck Loadout	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU13	P-1	30200560	Bulk Container Loadout	---	0.1	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU2	P-2	30200527	Single Pass Reversing Dryers	---	0.0	0.0	RP-GSF	TRAACS default parameters	60	8	300	37	111600	45.8191	-119.2763
2011	30-9503	EU3	P-1	30200551	Green Corn Dump Pits	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8186	-119.2775
2011	30-9503	EU4	P-1	30200530	Husking Beds/Sorting Tables	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8186	-119.2775
2011	30-9503	EU5	P-1	30200530	Material Transfer	---	0.7	0.1	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU6	P-1	30200560	Silage Chopper/Loadout	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU7	P-1	30200537	Sheller/Cleaner	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU8	P-1	30200540	Dust/Fines/Cobs/Discard Bin	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
2011	30-9503	EU9	P-1	30200560	Cob Truck Loadout	---	0.0	0.0	RP-FS	PSD Default Parameters	20	50	72	7	824668	45.8179	-119.2785
					Total Actual Emissions (tpy):	**4452.5**	**832.8**	**431.9**									

Oregon
John A. Kitzhaber, Governor

Department of Environmental Quality
Eastern Region Pendleton Office
800 SE Emigrant Avenue, Suite 330
Pendleton, OR 97801
(541) 276-4063
FAX (541) 278-0168
TTY 711

March 4, 2014

Ms. Andrea Goodwin
Oregon Department of Energy
625 Marion St. NE
Salem, OR 97301-3742

Re: AQ- Umatilla County
Perennial-Windchaser LLC
Permit: 30-0039

Dear Ms. Goodwin:

In accordance with OAR 345-021-0000(7), the Department of Environmental Quality (DEQ) is providing the following information with respect to the Perennial-Windchaser facility.

Federally-delegated air permit program (ACDP):

- The application was received on September 12, 2013.
- DEQ has not identified any additional information needs at this time, but we may request additional information at any time during the permit process.
- The time to issue this permit ranges from 10 to 18 months from the time the application was received. DEQ's best estimate at this time is September, 2014; however, there are many factors which may affect the actual issuance date and the permit may be issued earlier or later.

If you have any questions regarding the air quality permit, please contact me at 541-278-4621.

Sincerely,

Douglas Welch

Douglas Welch, P.E.
Sr. Environmental Engineer

Cc: Paul Neil, RTP Environmental Associates, Inc., 2050 Torrey Pines Road, La Jolla, CA 92037

EXHIBIT F

PROPERTY OWNERS

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

TABLE OF CONTENTS

TABLES

FIGURES

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: Within this Application for Site Certificate (ASC), the term “Site” includes the proposed location of the Station and its related or supporting facilities. “Site Boundary” is the perimeter of the Site, including the rights of way (ROWs) of the laterals and the temporary laydown area. Within the Site, there are five areas: 1) The “Energy Facility Site” refers to an area adjacent to the Hermiston Generating Plant (HGP), the boundary for which is defined as laid out in Figure F-8. 2) A temporary laydown area adjacent to the Energy Facility Site, process pipelines to the HGP, and any utility lines to the Station. 3) The transmission line ROW includes a 50-foot buffer around the existing HGP transmission line, along with additional tie-ins with the onsite switchyard and with a small transformer yard. The transmission line extends northward to the Bonneville Power Administration (BPA) McNary Substation, located about 11.59 miles from the Station. 4) The “step-up substation” is a new 500-kV step-up substation to be located south of the BPA McNary Substation to increase voltage of the line from 230 kV to 500 kV. An underground high voltage cable and aboveground transition structure will connect the step-up substation with the BPA McNary Substation. 5) The “natural gas pipeline” is a new pipeline lateral to be built within the existing 50-foot natural gas ROW that serves the HGP. The natural gas pipeline extends southward from the energy facility site to an existing pipeline operated by Gas Transmission Northwest, located approximately 4.63 miles south of the Energy Facility Site.

Portions of the Site are mostly within or adjacent to a farm zone; therefore, “adjacent” properties include those located within 500 feet of the notice distance of the Site Boundary until the transmission line corridor enters the city of Umatilla, where the notice distance becomes 100 feet.

F.2 IDENTIFICATION OF PROPERTY OWNERS

Perennial-WindChaser LLC obtained electronic data from Umatilla County on October 3, 2014, that included the names and mailing addresses of all owners of record of property located within the notice distance of the Site Boundary as shown on the most recent property tax assessment roll. Table F-1 provides the mailing address and name of property owners, each property's proximity to the Site Boundary, and the tax lot and map numbers for each property, along with a map identification number. Figures F-1 through F-11 show the property locations and their proximity to the Site Boundary.

The current owner of the Energy Facility Site property (M003) is Joe Zamrzla, Liberated L&E, LLC, from whom Perennial has an option to purchase the property.

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M003	Liberated L&E LLC 2229 E Avenue Q Palmdale, CA 93550	Energy Facility Site	4N2830	1200
M001	Liberated L&E LLC 2229 E Avenue Q Palmdale, CA 93550	Gas Line and Within 500 feet of Transmission Line and Power Plant	4N2830	1100
M002	Hermiston Generating Co & PacifiCorp In Care of PacifiCorp 78145 Westland Rd Hermiston, OR 97838	Temporary Construction Area	4N2830	1500
M004	AO Operations LLC DBA River Point Farms LLC 115 W Hermiston Ave #Ste. 240 Hermiston, OR 97838 and Sinclair System Int'l Inc 3115 S Willow Ave Fresno, CA 93725	Within 500 feet of Power Plant	4N2725A	500 & 500M1
M005	Bounds Roger S PO Box 148 Hermiston, OR 97838	Within 500 feet of Power Plant and Transmission Line	4N2725A	700
M006	BT Property LLC Attn: Tax Dept. PO Box 28606 Atlanta, GA 30358	Within 500 feet of Power Plant and Transmission Line	4N2725A	600
M009	Flying J Inc. c/o Pilot Travel Centers LLC PO Box 54470 Lexington, KY 40555	Transmission Line and within 500 feet of the Power Plant	4N2725A	200
M008	Hermiston Generating Co & PacifiCorp 825 NE Multnomah #STE 1900 Portland, OR 97239	Within 500 feet of Power Plant and Transmission Line and Process Lines	4N28C	2220

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M007	ConAgra Foods Lamb Weston Inc. Karima Tomasino PO Box 1900 Pasco, WA 99302	Within 500 feet of Power Plant and Transmission Line and Process Lines	4N2830	300
M010	ConAgra Foods Lamb Weston Inc. PO Box 397 Pilot Rock, OR 97868	Within 500 feet of Power Plant and Transmission Line and Gas line	4N28C	2206
M012	Umatilla Electric CO-OP Assn. PO Box 1148 Hermiston, OR 97838	Within 500 feet of Power Plant and Gas Line	4N2830	400
M011	Umatilla Electric CO-OP Assn. PO Box 1148 Hermiston, OR 97838	Within 500 feet of Power Plant and Gas Line	4N2830	500
M013	Art Mortgage Borrower Propco 2013LLC 10 Glenlake PKWY #STE 800 Atlanta, GA 30328	Within 500 feet of Power Plant and Gas Line	4N2830	100
M176	Petro Stopping Centers LP Travelcenters of America 24601 Center Ridge Rd #200 Westlake, OH 74135	Within 500 feet of Temporary Construction Area	4N2725	500
M177	Medelez Trucking LLC 1186 E Punkin Ctr Rd Hermiston, OR 97838	Within 500 feet of Temporary Construction Area	4N2725	600
M018	Umatilla Electric CO-OP Assn. PO Box 1148 Hermiston, OR 97838	Transmission Line	4N2725A	100
M020	Pedro Lawrence L & Mary C 78710 Westland Rd Hermiston, OR 97838	Transmission Line	4N27	1200
M022	7S Farming LLC 78638 Walker Rd Hermiston, OR 97838	Transmission Line	4N27	1100

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M025	Umatilla Electric CO-OP Assn. PO Box 1148 Hermiston, OR 97838	Transmission Line	4N27	3800
M026	Westland Irrigation District Attn. Stacey Wells PO Box 944 Hermiston, OR 97838	Transmission Line	4N27	401
M027	ConAgra Foods Lamb Weston Inc. Karima Tomasino PO Box 1900 Pasco, WA 99302	Transmission Line	4N27	206
M030	ConAgra Foods Lamb Weston Inc. Karima Tomasino PO Box 1900 Pasco, WA 99302	Transmission Line	4N27	100
M031	Cleaver Land, LLC PO Box 1191 Hermiston, OR 97838	Transmission Line	5N27	600
M032	Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Transmission Line	5N27	601
M034	Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Transmission Line	5N27	602
M035	Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Transmission Line	5N28C	1300
M038	Amstad Farms LLC PO Box 890 Hermiston, OR 97838 And Umatilla County 216 SE 4th St Pendleton, OR 97801	Transmission Line	5N28C	1401&1401A1

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M042	Woodward Diana Betts PO Box 63 Hermiston, OR 97838	Transmission Line	5N2820CC	200
M044	HLM Inc. 963 SW Simpson Ave #Ste 110 Bend, OR 97702	Transmission Line	5N2820CC	100
M046	HLM Inc. 963 SW Simpson Ave #Ste 110 Bend, OR 97702	Transmission Line	5N2820CB	7700
M047	Madrigal Mendoza Gerardo PO Box 1071 Hermiston, OR 97838	Transmission Line	5N2820CB	4200
M048	Anthony Garcilazo 3045 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820CB	4100
M049	Gene Raymond Jones PO Box 1221 Umatilla, OR 97882	Transmission Line	5N2820CB	4000
M050	Rosa Elena Campos Mendoza 49 Rio Senda St. Umatilla, OR 97882	Transmission Line	5N2820CB	300
M051	HLM Inc. 963 SW Simpson Ave #Ste 110 Bend, OR 97702	Transmission Line	5N2820CB	200
M052	HLM Inc. 963 SW Simpson Ave #Ste 110 Bend, OR 97702	Transmission Line	5N2820CB	100
M055	Jay D. Gibson 2733 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820BC	6400
M056	Meza Garcia Jorge A & Meza Alejandra 2677 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820BC	6300

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M057	Keenan J. & Amanda D. Schmidt 2040 SW Quinney Ave Pendleton, OR 97801	Transmission Line	5N2820BC	6200
M058	Isidro & Hermelinda Navarete 2633 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820BC	6100
M059	Catherine M. Christopher 2644 Vista Day Palomar Fallbrook, CA 92028	Transmission Line	5N2820BC	6000
M060	Alberta R. & John D. Nichols, Jr. (TDD) PO Box 338 Umatilla, OR 97882	Transmission Line	5N2820BC	5800
M061	Jeffrey Clements 2589 Blue Jay St. Umatilla, OR 97882	Transmission Line	5N2820BC	5100
M063	Jaquelin Espain 2533 Blue Jay St. Umatilla, OR 97882	Transmission Line	5N2820BC	5000
M065	Sandy J. Muniz 130 S Conway Pl. #17 Kennewick, WA 99336	Transmission Line	5N2820BC	4900
M067	Renato Ceniceros 326 NW Butte Dr. Hermiston, OR 97838	Transmission Line	5N2820BC	4800
M069	Burgess & Kathy Crandall 2433 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820BC	4700
M071	Fernando Vargas 2399 Blue Jay St. Umatilla, OR 97882	Transmission Line	5N2820BC	4600
M073	Miguel & Flora Radillo 2377 Blue Jay St Umatilla, OR 97882	Transmission Line	5N2820BC	4500

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M075	Donn A. & Alana J. McWilliams 2355 Blue Jay St. Umatilla, OR 97882	Transmission Line	5N2820BC	4400
M076	Pedro V. & Hilda Martinez 266 Pine Tree Ave. Umatilla, OR 97882	Transmission Line	5N2820BC	4300
M077	Horacio & Isidora Villarreal 277 Chukar Cir. Umatilla, OR 97882	Transmission Line	5N2820BB	9800
M078	Bruce A & Carla B McLane 170 Van Buren Ave Umatilla, OR 97882	Transmission Line	5N2820BB	8900
M081	Affordable Properties of Oregon LLC Soria Maurico (Agt) PO Box 298 Umatilla, OR 97882	Transmission Line	5N2820	700
M082	Griggs J A & E D & Pilch T J & V J Hinsley Richey J & Jodi L (Agt) 333 Pine Tree Ave Umatilla, OR 97882	Transmission Line	5N2820	702
M083	Garcia Guadalupe P & Margarita G PO Box 1582 Umatilla, OR 97882	Transmission Line	5N2820	800
M084	Anderson June PO Box 1234 Umatilla, OR 97882	Transmission Line	5N2820	900
M085	Umatilla-Morrow Co Headstart Inc 721 SE 3rd #Ste 107 Pendleton, OR 97801	Transmission Line	5N2820	1000
M086	Leathers Lloyd L PO Box 1708 Umatilla, OR 97882	Transmission Line	5N2820	1100

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M087	Scott Bruce A PO Box 8313 Black Butte Ranch, OR 97759	Transmission Line	5N2820	400
M088	Anderson June PO Box 1234 Umatilla, OR 97882	Transmission Line	5N2820	500
M089	Reffett Sandra E PO Box 65 Plymouth, WA 99346	Transmission Line	5N2820	300
M091	Reffett Wayne S PO Box 65 Plymouth, WA 99346	Transmission Line	5N2820	100
M095	State Of Oregon ODOT Tech Cntr Prop Mgmt #42500 4040 Fairview Industrial Dr SE #MS2 Salem, OR 97302	Transmission Line	5N2821	600
M102	Morrison John K & Morrison Gregory 1020 Boyer Ave Walla Walla, WA 99362 And Jones-Scott Co PO Box 775 Hermiston, OR 97838	Transmission Line	5N2816	2200&2200A1
M103	Bonney Stuart F (Est) PO Box 302 Hermiston, OR 97838	Transmission Line	5N2816	2300
M105	USA-BLM PO Box 2965 Portland, OR 97208	Transmission Line	5N2816	2000
M108	State Of Oregon ODOT Tech Cntr Prop Mgmt #42500 4040 Fairview Industrial Dr SE #MS2 Salem, OR 97302	Transmission Line	5N2816A	1700

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M109	USA-BLM PO Box 2965 Portland, OR 97208	Transmission Line	5N2816A	1600
M113	USA-BLM PO Box 2965 Portland, OR 97208	Transmission Line	5N2816A	400
M116	USA-BLM PO Box 2965 Portland, OR 97208	Transmission Line	5N2816A	300
M117	USA BPA PO Box 3621 Portland, OR 97208	Transmission Line and Step-up Substation	5N2816A	200
M127	USA BPA PO Box 3621 Portland, OR 97208	Transmission Line	5N2816A	100
M128	USA-BLM PO Box 2965 Portland, OR 97208	Transmission Line	5N2809	100
M014	Hermiston Generating Co & Pacificorp 78145 Westland Rd Hermiston, OR 97838	Within 500 feet of Transmission Line	4N2830	200
M015	Hibler LLC 2405 S Janeen St Boise, ID 83709	Within 500 feet of Transmission Line	4N28C	3000
M016	Bishop Karen 382 NW 10th St Hermiston, OR 97838	Within 500 feet of Transmission Line	4N28C	2903
M017	Hermiston Generating Co LP 78145 Westland Rd Hermiston, OR 97838	Within 500 feet of Transmission Line	4N28C	2900
M138	Flying J Inc C/O Pilot Travel Centers LLC PO Box 54470 Lexington, KY 40555	Within 500 feet of Transmission Line	4N2725A	202

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M019	USA Dept Of Army Umatilla Army Depot Umatilla, OR 97882	Within 500 feet of Transmission Line	4N2725	100
M021	USA Dept Of Army Umatilla Army Depot Umatilla, OR 97882	Within 500 feet of Transmission Line	4N27	200
M023	7s Farming LLC 78638 Walker Rd Hermiston, OR 97838	Within 500 feet of Transmission Line	4N27	900
M024	Bellinger Robert D & Lou A 29760 Bellinger Rd Hermiston, OR 97838	Within 500 feet of Transmission Line	4N27	600
M028	Conagra Foods Lamb Weston Inc Karima Tomasino PO Box 1900 Pasco, WA 99302	Within 500 feet of Transmission Line	4N2807B	200
M029	ConAgra Foods Lamb Weston Inc. Karima Tomasino PO Box 1900 Pasco, WA 99302	Within 500 feet of Transmission Line	4N28B	4300
M033	Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N28C	6701
M036	N & C Land LLC 71062 Perkins Rd Echo, OR 97826 And Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N27	501 & 501A1
M037	Amstad Farms LLC PO Box 890 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N28C	1200

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M040	Umatilla, City of USA Media Group LLC 12405 Powerscourt Dr #Fl 3 St Louis, MO 63131	Within 500 feet of Transmission Line	5N2820CC	400
M041	Umatilla, City of PO Box 130 Umatilla, OR 97882	Within 500 feet of Transmission Line	5N2820CC	300
M039	Cleaver Land, LLC P O Box 1191 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N28C	1400
M043	Guisti James E 2644 Blue Jay St Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820	2203
M043A	C C P D Inc PO Box 203 Pendleton, OR 97801	Within 100 feet of Transmission Line	5N2820	2207
M045	C C P D Inc PO Box 203 Pendleton, OR 97801 And Cleaver Alan PO Box 1192 Hermiston, OR 97838	Within 100 feet of Transmission Line	5N2820	2200&2290A1
M182	Coria Erik G & Solis Kimberly 49 Rio Senda Ave Bend, OR 97702	Within 100 feet of Transmission Line	5N2820CB	400
M181	William & Barbara Gonzales 192 Del Canto Ln Santa Barbara, CA 93110	Within 100 feet of Transmission Line	5N2820CB	3900
M180	William & Barbara Gonzales 192 Del Canto Ln Santa Barbara, CA 93110	Within 100 feet of Transmission Line	5N2820CB	4300
M179	Macias Laura Rivera & Armenta Armando M 492 Bridgeport Ave Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820CB	7600

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M178	CCPD Inc PO Box 203 Pendleton, OR 97801	Within 100 feet of Transmission Line	5N2820	2204
M053	Brown Charles Mark 19995 Gods Valley Rd Nehalem, OR 97131	Within 100 feet of Transmission Line	5N2820	1700
M054	Hayden Homes LLC 2464 SW Glacier Pl #Ste 110 Redmond, OR 97756	Within 100 feet of Transmission Line	5N2820	2300
M062	Deacon James E & Sirena D 2522 Curlew St Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	2400
M064	Matz Matthew M & Heather L 2488 Curlew St Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	2300
M066	Privett H John & Frances J 2466 Curlew St Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	2200
M068	Andrew Dean Hager Irrevocable Trust Attn: Bauhofer Shannon H (Trs) 250 NW Franklin Ave #204 Bend, OR 97701	Within 100 feet of Transmission Line	5N2820BD	2100
M070	Picker Stacey L & Monique 285 Hawk Circle Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	2000
M072	Ebker Phillip S 297 Hawk Circle Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	1900
M074	Leon Jorge & Maria B 288 Pine Tree Ave Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820BD	100
M079	Wells Fargo Bank NA 3476 Stateview Blvd Fort Mill, SC 29715	Within 100 feet of Transmission Line	5N2820BB	10000

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M080	Hayden Enterprises Inc 963 SW Simpson Ave #Ste 110 Bend, OR 97702	Within 100 feet of Transmission Line	5N2820BB	9700
M090	Nobles Clyde C & Betty L 650 Monroe St Umatilla, OR 97882	Within 100 feet of Transmission Line	5N2820	200
M092	Nobles Clyde C Jr & Betty L 650 Monroe St Umatilla, OR 97882	Within 500 feet of Transmission Line	5N2817D	1600
M183	Nobles Clyde C Jr & Betty L 650 Monroe St Umatilla, OR 97882	Within 500 feet of Transmission Line	5N2817D	1500
M184	Simplot Industries Inc PO Box 27 Boise, ID 83707	Within 500 feet of Transmission Line	5N2817D	600
M185	State of Oregon ODOT Tech Cntr Prop Mgmt #42500 4040 Fairview Industrial Dr SE #MS2 Salem,OR 97302	Within 500 feet of Transmission Line	5N2821	800
M093	Umatilla County Of 216 SE 4th St Pendleton, OR 97801	Within 500 feet of Transmission Line	5N28217D	800
M094	Umatilla County Of 216 SE 4th St Pendleton, OR 97801	Within 500 feet of Transmission Line	5N28217D	1100
M096	Wadekamper Lon G 29899 Country Ln Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2821	1000
M097	Hampton Flora L Cruz Marcelino Valle & Alicia (Agt) 1360 6th St #3 Umatilla, OR 97882	Within 500 feet of Transmission Line	5N2821	700

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M098	White Debra A 1/3 ET AL 2/3 Chairez Saul Vollmer (Agt) 77311 Colonel Jordan Rd Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2821	300
M099	White Debra A 1/3 ET AL 2/3 Chairez Saul Vollmer (Agt) 77311 Col Jordan Rd Umatilla, OR 97882	Within 500 feet of Transmission Line	5N2821	400
M100	Bonney Stuart F (EST) PO Box 302 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2821	200
M101	Bonney Stuart F (EST) PO Box 302 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2821	100
M104	Umatilla Electric COOP Assoc PO Box 1148 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2816	2400
M106	Morrison John K & Morrison Gregory 1020 Boyer Ave Walla Walla, WA 99362 And Jones-Scott Co PO Box 775 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2816	2100&2100A1
M107	Umatilla County Of 216 SE 4th Pendleton, OR 97801	Within 500 feet of Transmission Line	5N2816	1700
M110	Wright Walter & Carol D 326 W Court St Goldendale, WA 98620	Within 500 feet of Transmission Line	5N2816	700
M140	Oregon Department Of Transportation Right Of Way Section MS#2 4040 Fairview Industrial Dr SE Salem, OR 97302	Within 500 feet of Transmission Line	5N2816	900

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M111	USA-BR 550 W Fort St Boise, ID 83724	Within 500 feet of Transmission Line	5N2816	1000
M112	Timpy Anna L 401 6th St Umatilla, OR 97882 And J R Zukin Corp DBA Meadow Outdoor Advertising PO Box 331 The Dalles, OR 97058	Within 500 feet of Transmission Line	5N2816	1100 &1100A1
M139	USA-BR 550 W Fort St Boise, ID 83724	Within 500 feet of Transmission Line	5N2816	800
M119	USA-BR 550 W Fort St Boise, ID 83724	Within 500 feet of Transmission Line	5N2816	600
M114	Jenks Duane O & Jenks Vard B (Trs) PO Box D Moses Lake, WA 98837	Within 500 feet of Transmission Line	5N2816A	600
M115	USA-BR 550 W Fort St Boise, ID 83724	Within 500 feet of Transmission Line	5N2816A	500
M118	USA-BR 550 W Fort St Boise, ID 83724	Within 500 feet of Transmission Line	5N2816A	700
M120	USA-BLM PO Box 2965 Portland, OR 97208	Within 500 feet of Transmission Line	5N2816A	1000
M121	Moon Kenneth & Linda PO Box 68 Boring, OR 97009	Within 500 feet of Transmission Line	5N2816A	900
M122	Moon Kenneth & Linda PO Box 68 Boring, OR 97009	Within 500 feet of Transmission Line	5N2816A	800

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M123	Moon Kenneth & Linda PO Box 68 Boring, OR 97009	Within 500 feet of Transmission Line	5N2816A	1100
M124	Bonney Stuart F (EST) P O Box 302 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2816A	1300
M125	Bonney Stuart F (EST) P O Box 302 Hermiston, OR 97838	Within 500 feet of Transmission Line	5N2816A	1200
M126	USA-BLM PO Box 2965 Portland, OR 97208	Within 500 feet of Transmission Line	5N28A	400
M174	Liberated L & E LLC 2229 E Avenue Q Palmdale, CA 93550	Gas Line	4N2830	600
M150	Liberated L & E LLC 2229 E Avenue Q Palmdale, CA 93550	Gas Line	4N2830	2100
M149	Snakcorp Inc. c/o Shearers Foods Inc. 692 Wabash Ave N Brewster, OH 44613	Gas Line	4N28C	3800
M152	Westland Irrig Dist Attn Stacey Wells PO Box 944 Hermiston, OR 97838	Gas Line	4N2831	100
M157	Sharkey Philip E & Lora L 29689 Noble Rd Hermiston, OR 97838	Gas Line	4N2831	800
M160	Johnston Andrew Dean 29616 Noble Rd Hermiston, OR 97838	Gas Line	4N2831	1000
M162	Gelissen Paul C 29592 Noble Rd Hermiston, OR 97838	Gas Line	4N2831	1200

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M164	Boettcher Jari E & Shelia J 29957 Noble Rd Hermiston, OR 97838	Gas Line	4N2831	2300
M167	ELH LLC 76855 Highway 207 Echo, OR 97826	Gas Line	3N28	2401
M166	Madison Ranches Inc. 29299 Madison Rd Echo, OR 97826	Gas Line	3N28	2501
M168	Madison Ranches Inc. 29299 Madison Rd Echo, OR 97826	Gas Line	3N28	2600
M170	Madison Ranches Inc. 29299 Madison Rd Echo, OR 97826	Gas Line	3N28	2700
M171	JR Simplot Company PO Box 27 Boise, ID 83707	Gas Line	3N28	2300
M173	JR Simplot Company PO Box 27 Boise, ID 83707	Gas Line	3N28	2307
M172	Madison Ranches Inc. 29299 Madison Rd Echo, OR 97826	Gas Line	3N28	6100
M141	Turner Gary (TRS) 29307 Feedville Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N28C	2802
M142	Craft Rick A 1118 N Michigan Ave Caldwell ID, 83605	Within 500 feet of Gas Line	4N2830	800
M143	Craft Thomas D 1118 N Michigan Ave Caldwell ID, 83605	Within 500 feet of Gas Line	4N2830	900

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M144	Driftwood Meacham LLC Burnam Norma (Agt) 78001 Cottonwood Bend Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	1000
M145	Strand Mary E & Paul J 77941 Cottonwood Bend Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	1600
M146	Coria Eva P c/o Bell Merry S 77935 Cottonwood Bend Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	1700
M147	Bell Merry Susan 77935 Cottonwood Bend Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	1800
M148	Buckallew Cregg A & M Mary 77867 Cottonwood Bend Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	1900
M151	Liberated L & E LLC Colmenero Fred (Agt) 80261 S Edwards Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2830	2000
M153	McDaniels Eldon 111003 E Windward Ln Kennewick, WA 99338	Within 500 feet of Gas Line	4N2831	301
M156	Wood Daniel J & Debora L 33256 E Walls Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	700
M155	Wood Daniel J & Debora L 33256 E Walls Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	600

Table F-1 Property Owners Within Notice Distance of the Site Boundary

Map ID Number	Mailing Address and Name	Relationship to Site Boundary	Tax Map	Lot Number
M154	Barton George H 1390 SW 11th St Hermiston, OR 97838 And JR Zukin Corp DBA Meadow Outdoor Adv PO Box 331 The Dalles, OR 97058	Within 500 feet of Gas Line	4N2831	400 & 400A1
M158	Boettcher Jari E & Shelia J 29957 Noble Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N28C	5800
M159	Smith Raymon J & Leah Joy 29704 Noble Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	900
M161	Westland Irrig Dist Attn Stacey Wells PO Box 944 Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	1100
M163	Gelissen Paul C 29592 Noble Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	2200
M165	Curtis Bert W 29416 Noble Rd Hermiston, OR 97838	Within 500 feet of Gas Line	4N2831	2100
M169	JR Simplot Company PO Box 27 Boise, ID 83707	Within 500 feet of Gas Line	3N28	2601
M175	JR Simplot Company PO Box 27 Boise, ID 83707	Within 500 feet of Gas Line	3N28	6101

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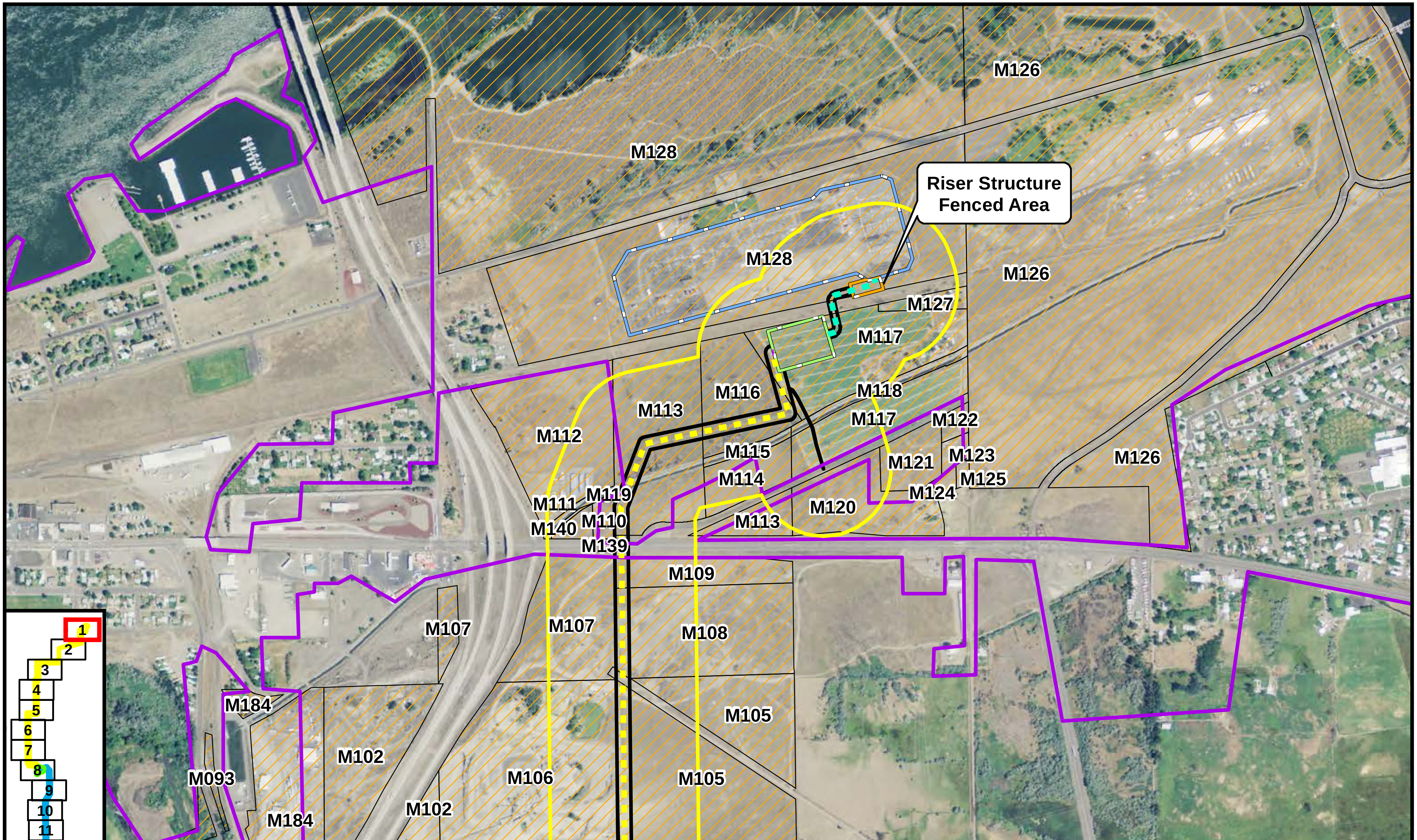

NORTH

0 500 1,000 Feet

Scale: 1 Inch = 1,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

Burns & McDonnell SINCE 1898

Figure F-1
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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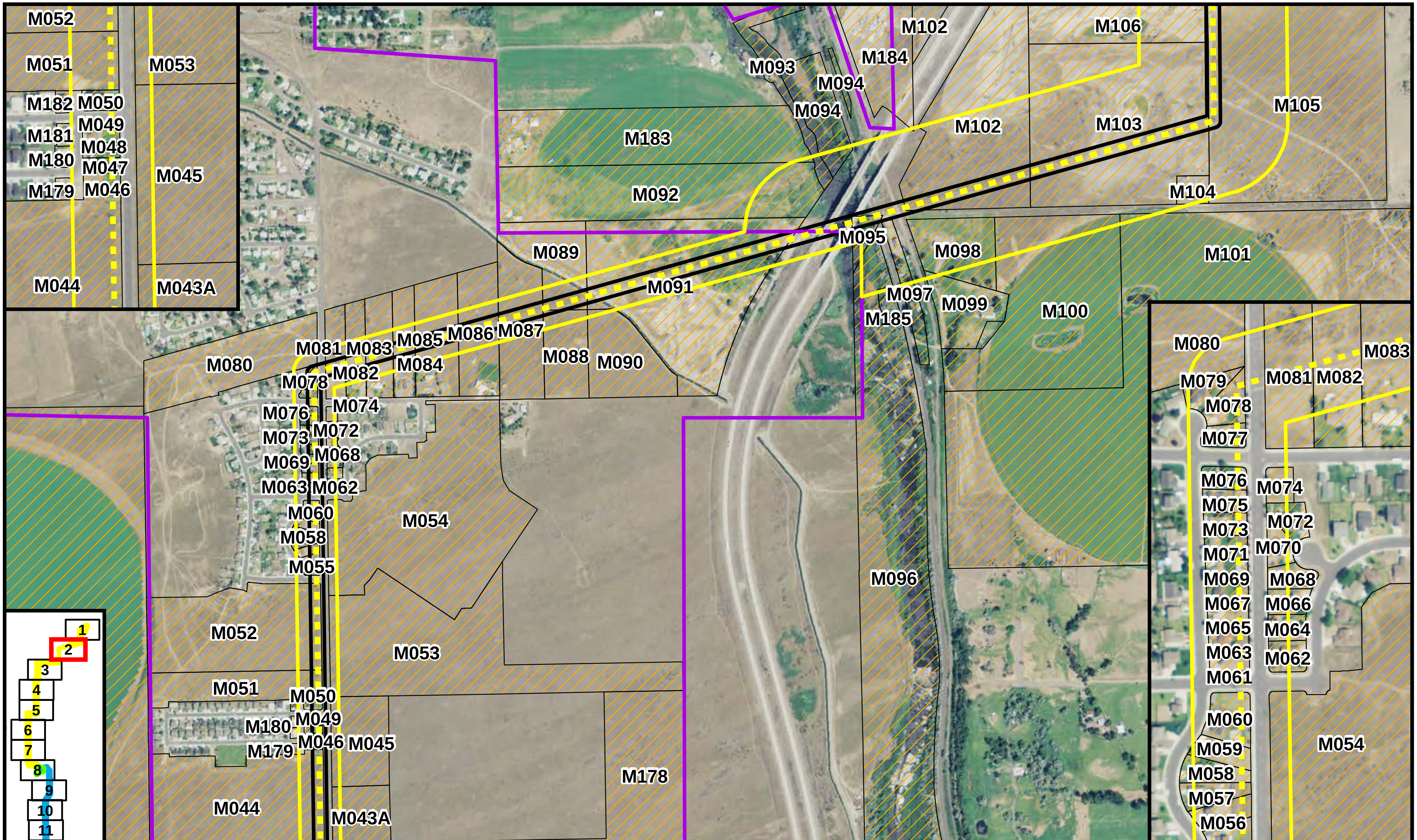

NORTH

0 500 1,000 Feet

Scale: 1 Inch = 1,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

Burns & McDonnell SINCE 1898

Figure F-2
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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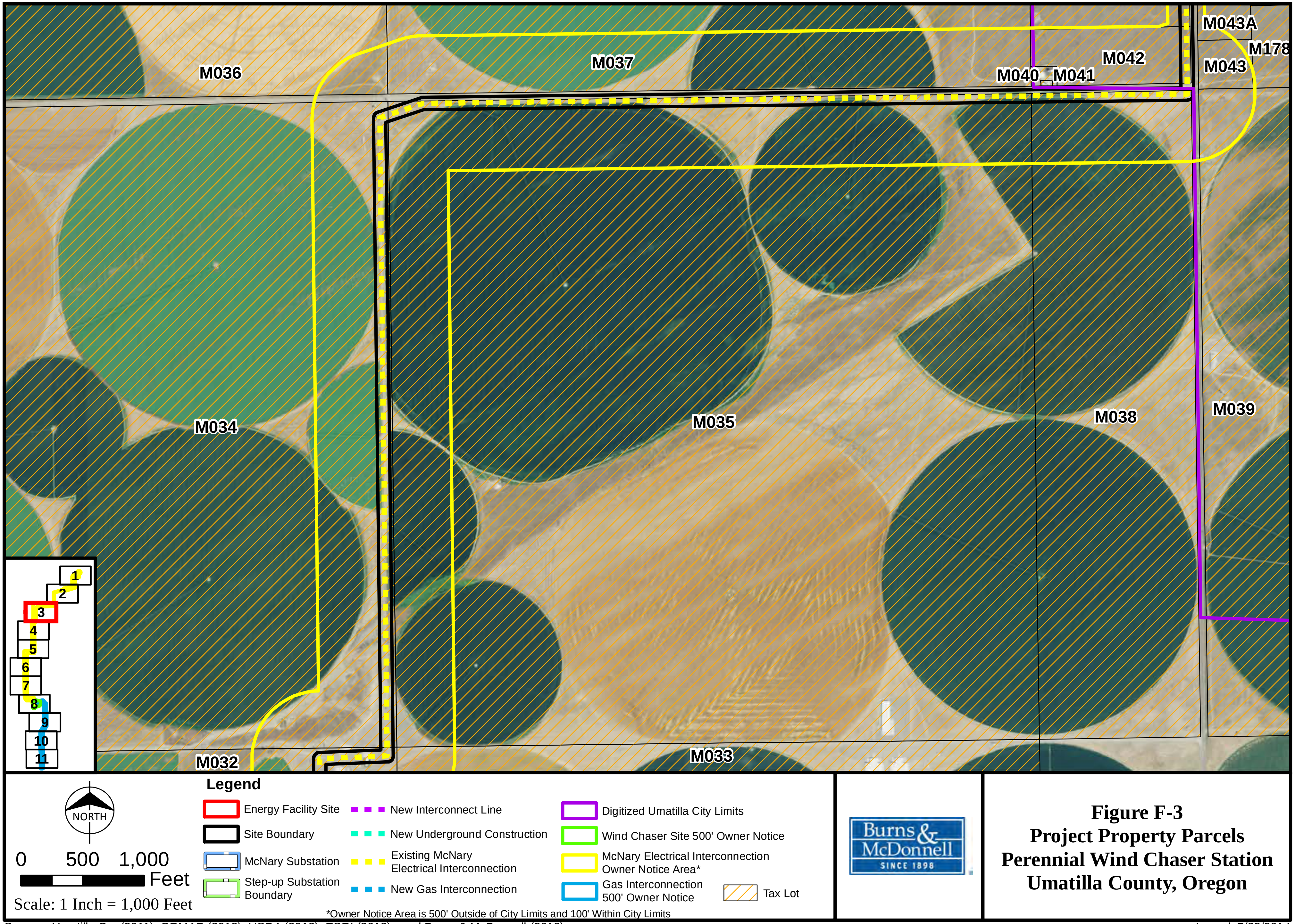

Figure F-3
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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Scale: 1 Inch = 1,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

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Figure F-4
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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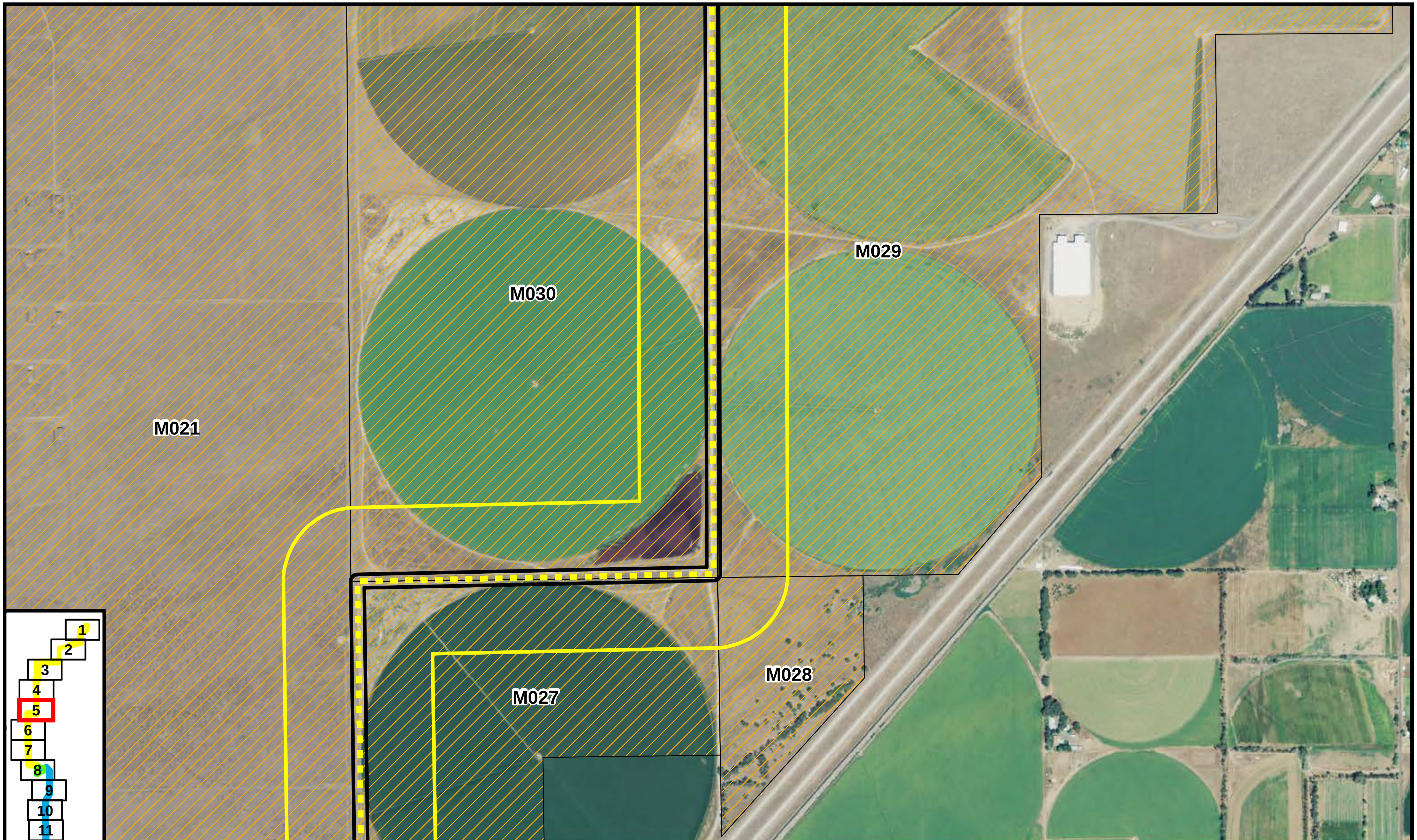

Legend

NORTH

0 500 1,000 Feet

Scale: 1 Inch = 1,000 Feet

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

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Figure F-5
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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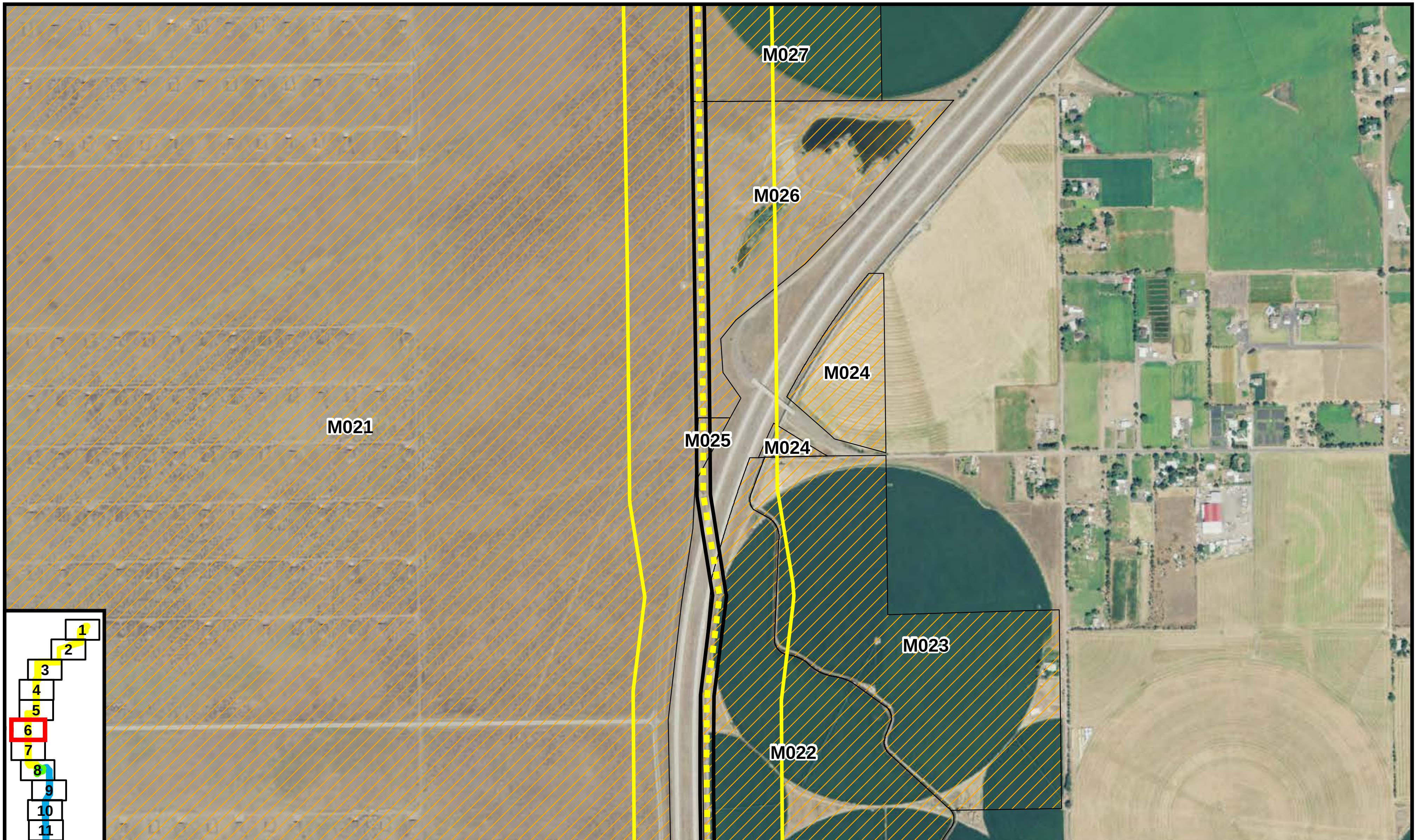

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

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Figure F-6
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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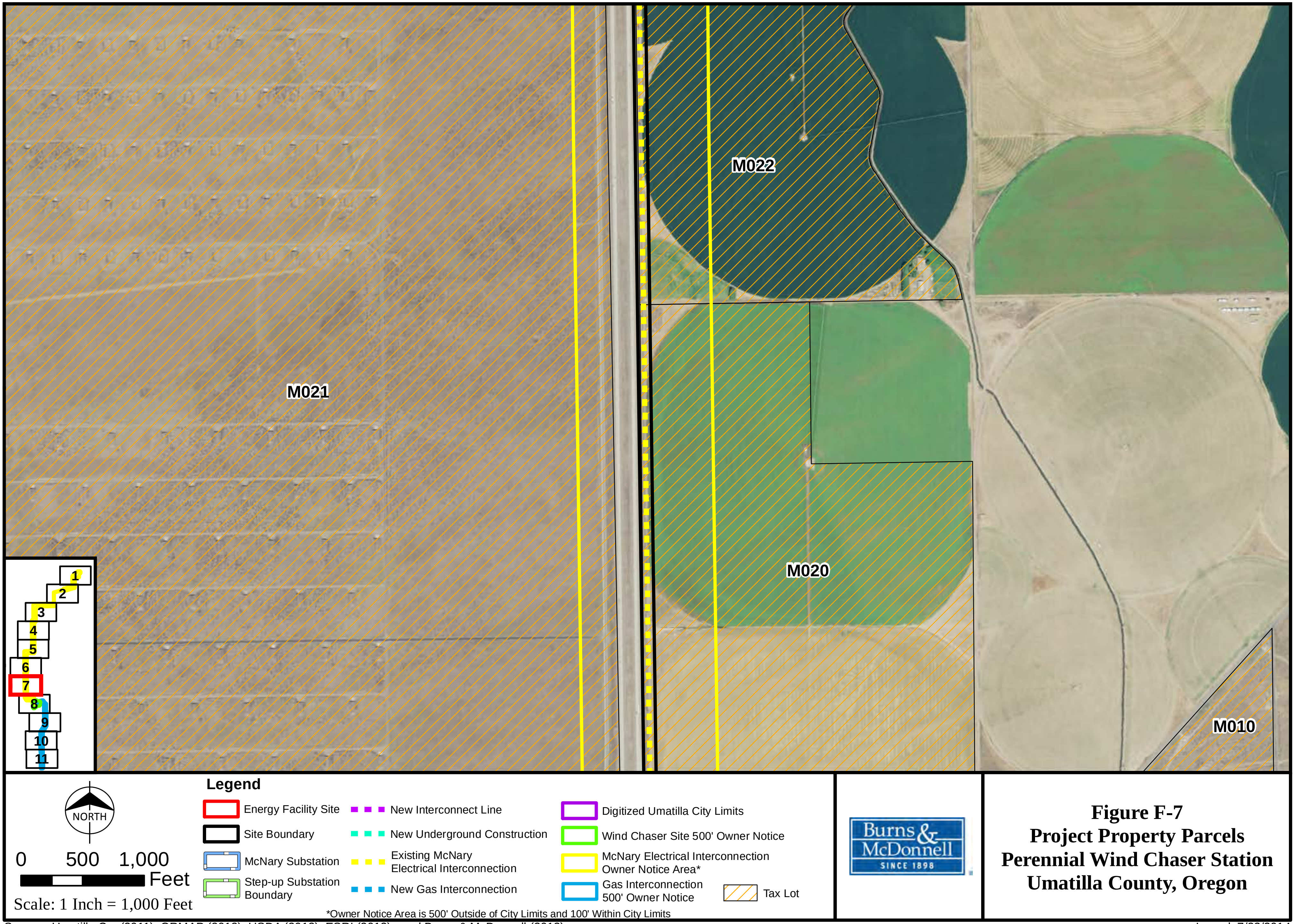

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Figure F-7
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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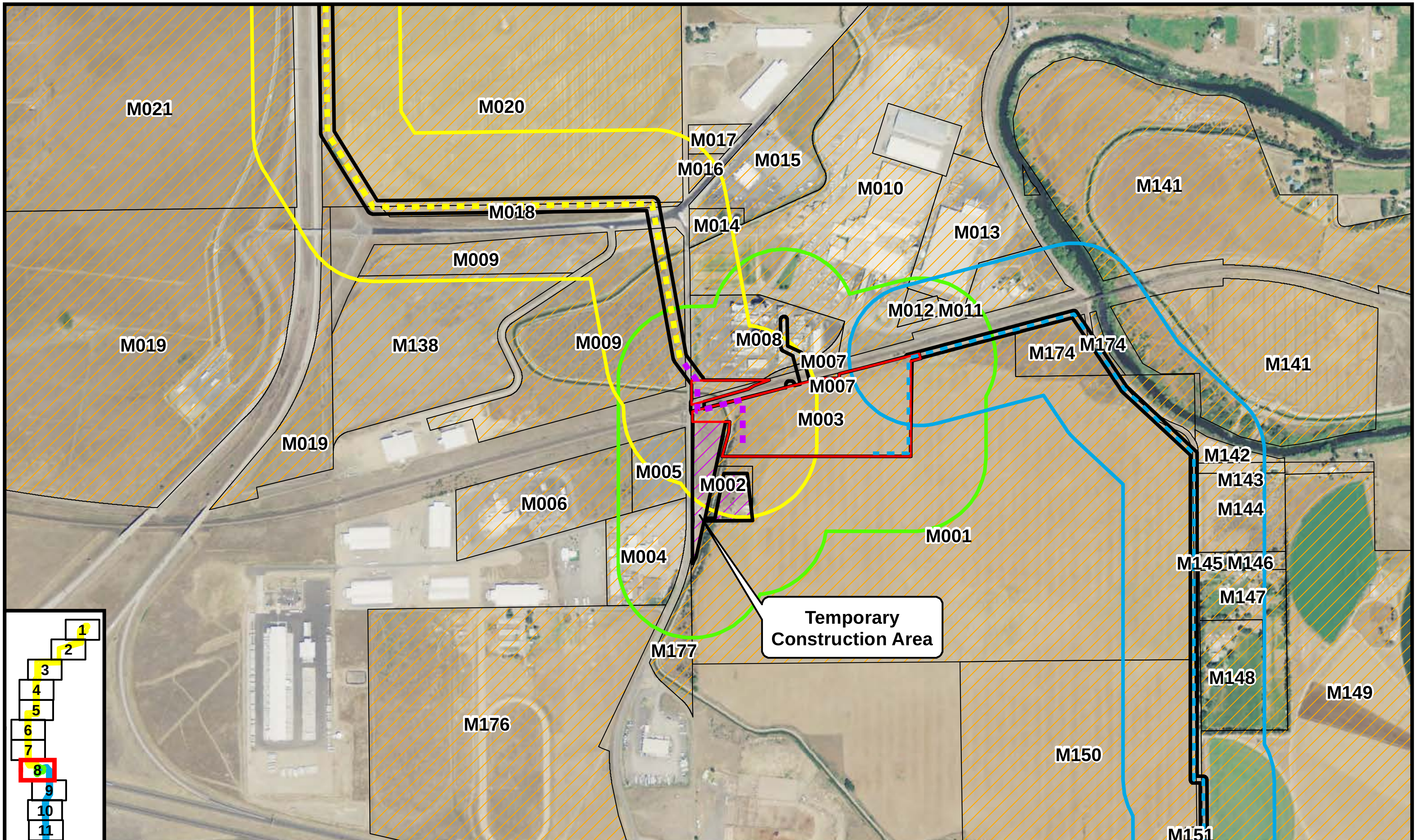

NORTH

0 500 1,000 Feet

Scale: 1 Inch = 1,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
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- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

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Figure F-8
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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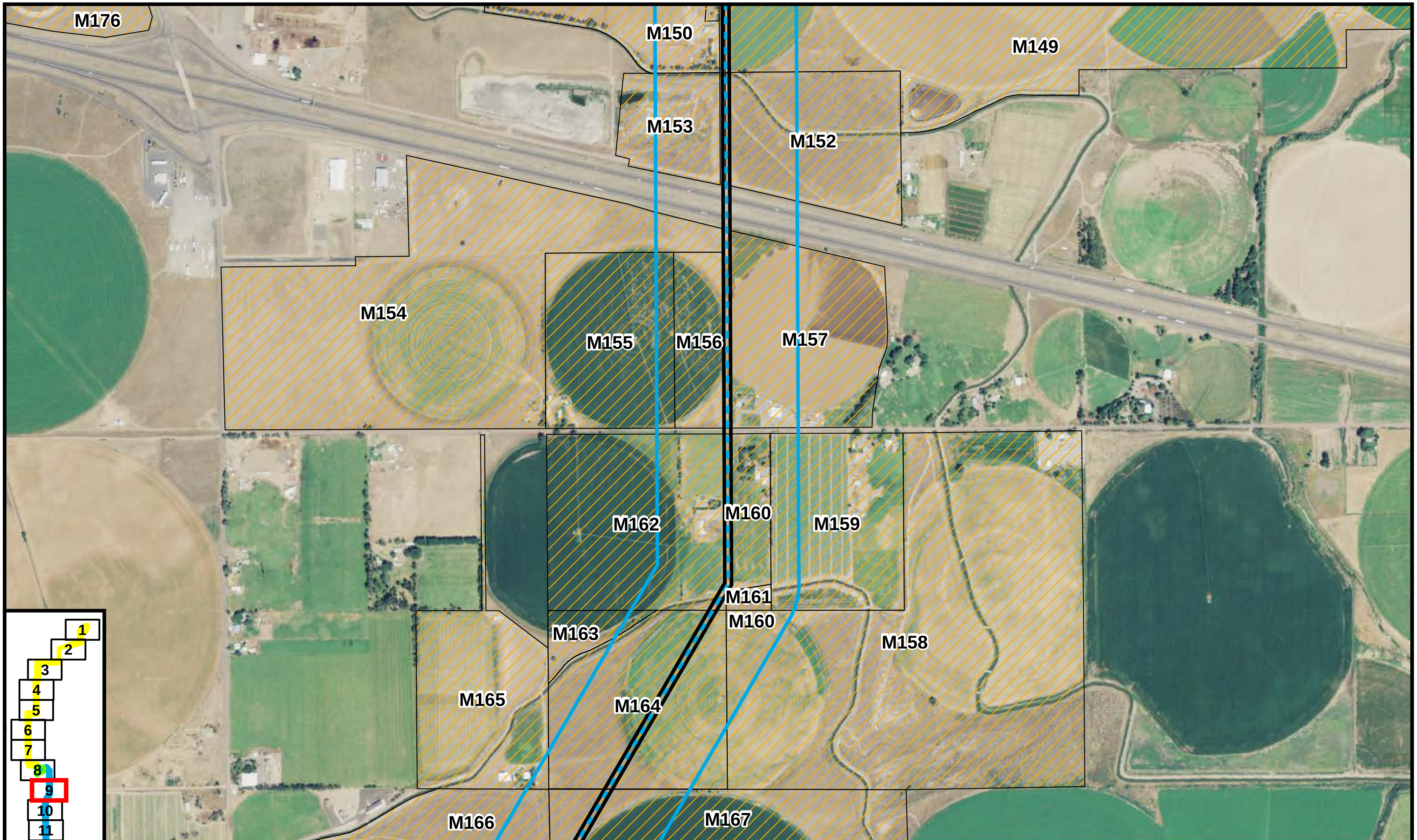

NORTH

0 500 1,000 Feet

Scale: 1 Inch = 1,000 Feet

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

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Figure F-9
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2013)

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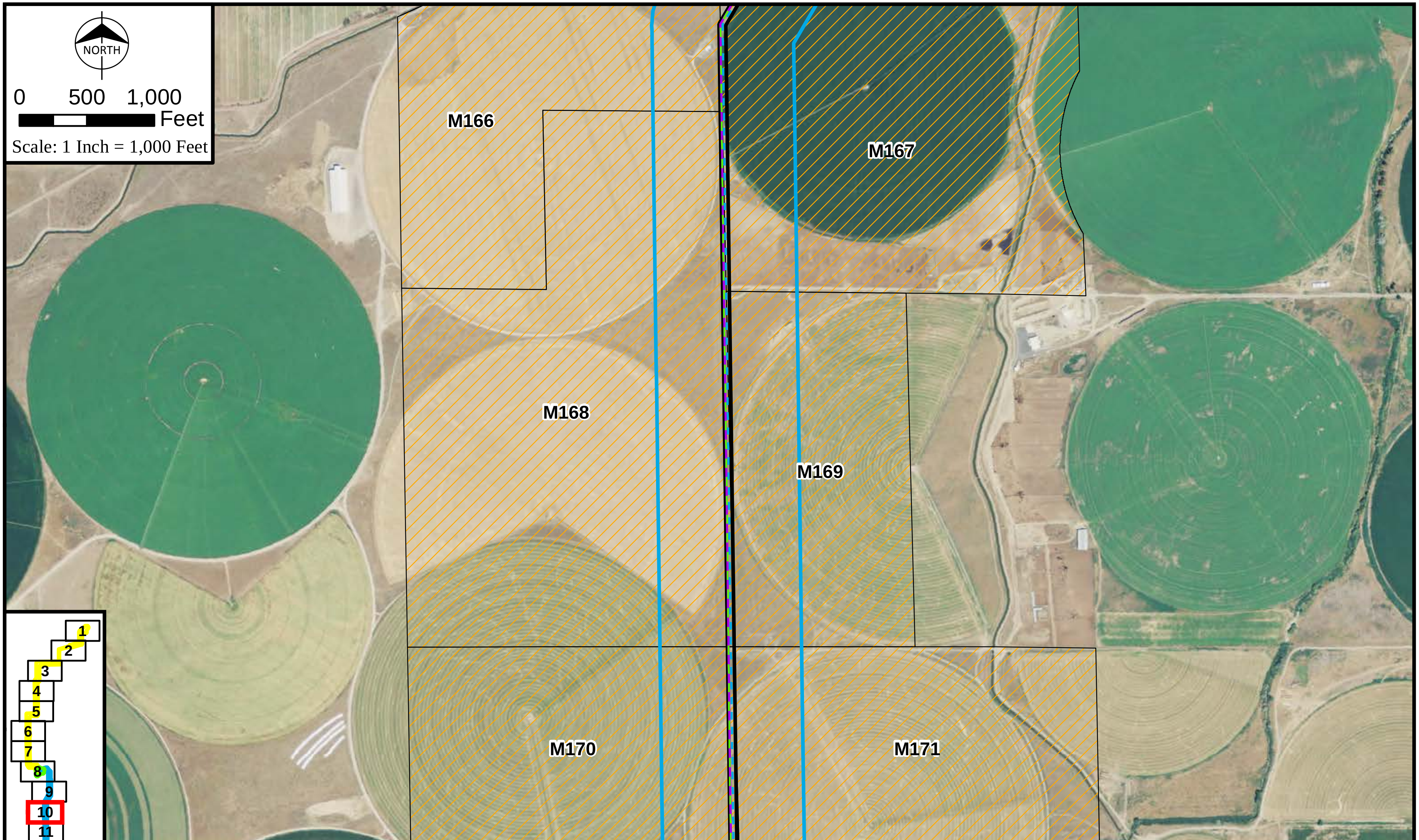

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot
- Temporary Constrution Area
- Existing Cascade Gasline (Approximate Location)
- Existing GTN Gasline (Approximate Location)
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

Figure F-10
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2014)

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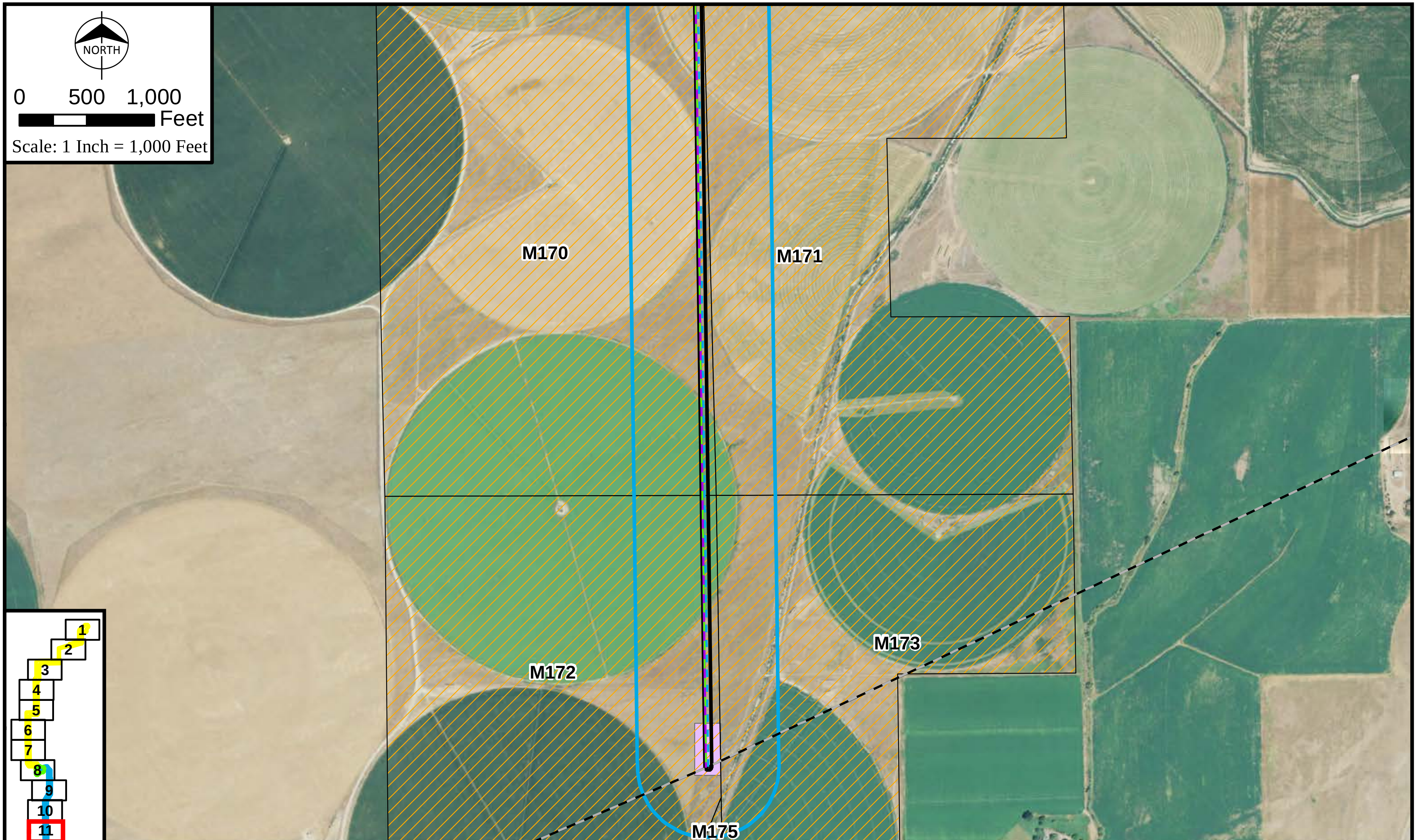

Legend

- Energy Facility Site
- Site Boundary
- McNary Substation
- Step-up Substation Boundary
- Digitized Umatilla City Limits
- Wind Chaser Site 500' Owner Notice
- McNary Electrical Interconnection Owner Notice Area*
- Gas Interconnection 500' Owner Notice
- Tax Lot
- Temporary Constrution Area
- Existing Cascade Gasline (Approximate Location)
- Existing GTN Gasline (Approximate Location)
- New Interconnect Line
- New Underground Construction
- Existing McNary Electrical Interconnection
- New Gas Interconnection
- Metering Station

*Owner Notice Area is 500' Outside of City Limits and 100' Within City Limits

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Figure F-11
Project Property Parcels
Perennial Wind Chaser Station
Umatilla County, Oregon

Source: Umatilla Co. (2011), ORMAP (2012); USDA (2012); ESRI (2013) ; and Burns & McDonnell (2014)

Issued: 7/23/2014

EXHIBIT G

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

TABLE OF CONTENTS

TABLES

G.1 INTRODUCTION

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

Response: Exhibit G identifies the inventory of industrial materials that will flow into and out of the Perennial Wind Chaser Station (Station) in substantial quantities during construction and operation and, where applicable, describes how these materials will be stored and managed. See Exhibit V – Solid Waste and Wastewater for information regarding solid waste and wastewater handling and disposal.

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.*

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:

G.2.1 Construction Materials

A summary of the substantial quantities of industrial materials flowing into and out of the Station during construction is shown in Table G-1.

Table G-1 Summary of Substantial Quantities of Industrial Materials Flowing Into and Out of the Station During Construction

Material	Quantity	Unit of Measurement
Asphalt[1]	1,900	cubic yard
Gravel[1]	10,557[1]	cubic yard
Gravel with Zero Liquid Discharge Alternative	10,680	cubic yard
Concrete	8,634	cubic yard
Sand	3,150	ton
Fill Dirt	3,300	cubic yard

Note:
[1]All asphalt and gravel will have a depth of 6 inches.

G.2.2 Fuel

The Station will be served by a new natural gas pipeline lateral operated by Cascade Natural Gas Corporation that will carry natural gas from an existing pipeline operated by Gas Transmission Northwest to the Station. The total natural gas consumption for this facility is anticipated to be approximately 89.3 million standard cubic feet per day. Natural gas will be used on an as-needed basis from the pipeline lateral; therefore, no fuel will be stored onsite. A gas detector and CO_2 fire suppression system will be installed in the combustion turbine generator enclosures and fuel gas compressor enclosures. Portable fire extinguishers will also be placed at key locations in the station. See Exhibit B – Project Information for more information on fire prevention and suppression provisions.

G.2.3 Solid Waste Materials

Generation, storage, and disposal of solid waste, hazardous waste, and wastewater are discussed in detail in Exhibit V – Solid Waste and Wastewater. A summary is provided below.

During construction, approximately 2.5 tons of solid waste will be produced each month. Solid waste will consist of domestic refuse, office waste, packaging materials, steel cut-offs, and construction materials. Construction of the Station is expected to generate waste steel, other waste metals, and normal miscellaneous construction debris (consisting of wood, concrete, and other refuse). During operation, approximately 10 tons of refuse will be produced each year, comprising office and maintenance waste. Facility retirement will produce construction debris of various quantities. Solid waste will be recycled or reused to the greatest extent possible; waste that cannot be recycled or reused will be collected and disposed of at Finley Buttes Regional Landfill.

Hazardous waste could include oil rags, spent batteries, and equipment and vehicle maintenance solvents and oils. Chemicals used to clean piping systems will also be managed as hazardous waste. The Station is expected to be classified as a Conditionally Exempt Small Quantity Generator, under Title 40 Code of Federal Regulations Part 261.5, meaning that it will produce less than 220 pounds of hazardous waste each month during operation. Used oils, universal wastes, and hazardous wastes will be disposed of through an appropriate waste disposal service provider. All plant and equipment drains will be consolidated and then routed to an oil/water separator(s). A complete Spill Prevention, Control and Countermeasure Plan will be developed during the design phase of the Project.

During construction and operation, the Station will produce sanitary sewage and wastewater of various quantities (see Exhibit V – Solid Waste and Wastewater). Portable toilets will be used during construction, and a new septic tank and leach field are proposed during operation. During operation, non-sanitary wastewater will be routed to the circulating water system of the adjacent Hermiston Generating Plant (HGP) as make-up in the cooling tower. In the event it is determined that cooling tower blowdown cannot be reclaimed by the HGP, an alternative wastewater treatment system will be used.

Lamb Weston's Water Pollution Control Facilities Permit allows Lamb Weston's facility to manage and dispose of the HGP's wastewater, among other wastewaters, by land application for beneficial use on the North Farm and the Madison Farm in accordance with the DEQ-approved Operations, Monitoring, and Management Plan. Lamb Weston's permit is currently being renewed. Because this permit is under review, Lamb Weston has not been able to consent to the Project sending reclaimed water to the HGP. If Lamb Weston is eventually able to accept reclaimed water from the HGP that has come from the Station, then Perennial prefers to have all the necessary process and approvals in place to do so. Should Lamb Weston not be able to accept reclaimed water from the HGP that has come from the Station, then Perennial would install a zero liquid discharge (ZLD) system. See section G.2.4 for a description of the proposed ZLD system alternative.

G.2.4 Selective Catalytic Reduction System

The selective catalytic reduction (SCR) system will utilize 29 percent aqueous ammonia solution as a reagent for control of nitrogen oxide (NO_X) emissions. The aqueous ammonia solution will be delivered via tanker truck and transferred into two onsite storage tanks. Ammonia unloading will be accomplished using a tanker truck–mounted pump/compressor. Forwarding pumps will transfer the aqueous ammonia solution from the storage tank to be heated and vaporized in the vaporization skid. The vaporized ammonia will then be injected into the SCR system by the ammonia injection skid. Secondary containment for the aqueous ammonia storage tanks will be provided by a dike around the storage tank. The dike area will be designed to contain 110 percent of the volume of the ammonia storage tank. The aqueous ammonia system will be designed with proper handling, safety, and alarming equipment to minimize the risk of release and exposure to ammonia.

The SCR systems utilize catalysts to control NO_X and carbon monoxide. The catalysts require periodic replacement. The depleted catalysts will be removed and shipped offsite to be regenerated by the catalyst supplier.

G.2.5 Zero Liquid Discharge System

Should the Station not be able to send reclaimed water to the HGP, Perennial proposes to install a ZLD system that recycles all available water and reduces the resultant wastewater to a solid waste. The components of a ZLD system are described below:

The purpose of the high efficiency reverse osmosis (HERO) process is to recover and recycle most of the cooling tower blowdown back into the plant. Cooling tower blowdown and miscellaneous plant drains are routed to a clarifier. The clarifier removes the suspended solids, which, after running the clarifier waste through a filter press, will be disposed of as a solid waste. The clarifier effluent will be routed to the HERO process. The HERO process consists of a weak acid cation exchanger, removal of carbon dioxide, and a reverse osmosis (RO) system. The weak acid cation exchanger is used to completely soften the water. In order to ensure complete hardness removal, the hardness-to-alkalinity ratio may need to be adjusted by injecting sodium hydroxide (caustic) before entering the weak acid cation exchanger. The weak acid cation exchanger removes the hardness and produces carbonic acid that is dissolved in the effluent. Acid is added to the weak acid cation exchanger effluent to remove any remaining alkalinity in the water.

The next step is to remove the carbon dioxide in the weak acid cation effluent. This is done either by a forced/induced draft decarbonator or in a vacuum degasifier. After the carbon dioxide is removed, the pH of the water is adjusted. The desired pH of the influent to the RO is 10 or higher; sodium hydroxide (caustic) can be injected to increase the pH to the desired limit. Sodium bisulfite and antiscalant are used at the inlet of the RO. The RO product water is recycled back to the plant and used as the cooling tower makeup. The RO reject water is sent to a crystallizer for complete crystallization and precipitation of solids. The solids are transported offsite to a landfill. Based on an estimated 4,400 operating hours per year, it is anticipated that 1,540 tons per year of solid waste will be generated. See Exhibit U – Public Services, Section U.4.4, for further details concerning disposal of solid waste produced by the ZLD system.

A building will be required to house all HERO process equipment. Chemicals used for the treatment of process water are listed in Table G-2. These will be delivered and stored in bulk or semi-bulk tanks, totes, drums, or bags. The tanks, totes, drums, and bags will be stored within the structure housing the ZLD system, the details for which will be determined during the design phase of the Project.

G.2.6 Other Chemicals

Sulfuric acid, sodium hypochlorite, and a corrosion inhibitor used in cooling tower and service water quality control, as well as sodium bisulfite used in demineralized water treatment, will be stored in tanks and totes onsite. The tanks will be supported on saddles and surrounded by a secondary containment dike. The secondary containment will be designed to hold 110 percent of the volume of the largest tank in the secondary containment.

Chemicals used for the treatment of process water are listed in Table G-2. These will be delivered and stored in bulk or semi-bulk tanks, totes, drums, or bags. The tanks, totes, drums, and bags will be stored within the water treatment building located directly to the east of the administration building.

Miscellaneous chemicals and equipment lubricants for equipment maintenance, fire pump operation, generator cooling, and fire suppression will be stored within proposed buildings onsite. The secondary containment of oil containers will be designed to hold 100 percent of the volume of the largest tank in the secondary containment plus a 24-hour, 25-year rain event or 110 percent of the volume, whichever is greater. A double-lined plastic oil container will be used to collect used oil for recycling.

G.2.7 Other Materials

Compressed gases used at the Station, such as carbon dioxide and nitrogen, will be stored in approved returnable cylinders. Hydrogen will be stored in approved high-pressure storage cylinders mounted on pads, on mobile storage tanks, or in approved returnable cylinders. All cylinders containing compressed gases will be secured against falling by an approved method to prevent damage.

All landscaping, including lawn care and weed control, will be provided by a third party contractor who has not yet been selected. Any herbicide or other related chemical necessary for lawn care and weed control will be applied by the contractor and not stored at the facility.

Table G-2 summarizes the Station's chemical usage and storage containers with and without the ZLD system.

Table G-2 Anticipated Chemical Usage and Storage

Material	Purpose	Plant Usage without ZLD System	Plant Usage with ZLD System	Maximum Amount Stored	Storage Type
Natural gas	Primary fuel	89.3 million standard cubic feet/day	89.3 million standard cubic feet/day	None	Not applicable
Sulfuric acid	Circulating water and cooling tower treatment	58 gpd	67 gpd	6,000 gallons	Bulk storage tank
Scale/corrosion inhibitor	Cooling tower treatment	13 gpd	5 gpd	400 gallons	Tote
Sodium hypochlorite	Circulating water and cooling tower treatment Service water treatment	108 gpd 210 gpd	40 gpd 65 gpd	6,000 gallons 6,000 gallons	Bulk storage tank Bulk storage tank
Sodium bisulfate	Demineralized system reverse osmosis/HERO	2 gpd	7 gpd	400 gallons	Tote
Scale inhibitor	Demineralized system reverse osmosis	2 gpd	2 gpd	400 gallons	Tote
Filter Aid	Service water treatment	840 gpd	55 gpd	2 x 12,000 gallons/6000 gallons	Bulk storage tank
29% aqueous ammonia solution	NO_X control in the SCR	2,035 gpd	2,035 gpd	2 x 12,000 gallons	Bulk storage tank
Misc. cleaners/degreasers	Equipment maintenance	< 50 gallons/month	< 50 gallons/month	5 and 55 gallons	Drums
Insulating oil	Electrical equipment such as transformers	Initial fill	Initial fill	55 gallons	Drums
Diesel #2	Fire pump operation and emergency generator	Maintenance testing and during fire and natural disaster scenario	Maintenance testing and during fire and natural disaster scenario	2 x 100 gallons	Tank, UL
Hydrogen	Electrical generator coolant	Top off as required	Top off as required	45,000 cubic feet	Bulk storage or returnable cylinders

Table G-2 Anticipated Chemical Usage and Storage

Material	Purpose	Plant Usage without ZLD System	Plant Usage with ZLD System	Maximum Amount Stored	Storage Type
Lubricating oil – Synthetic	Turbine lubricating oils	< 5 gpd	< 5 gpd	4 x 150 gallons	Drums
Lubricating oil – Mineral	Turbine lubricating oils	< 5 gpd	< 5 gpd	4 x 6,000 gallons	Drums
Carbon dioxide	Gas turbine fire suppression	None, except in fire	None, except in fire	4,000 lbs	Bulk storage or returnable cylinders
Used oil	Used oil	< 5 gpd	< 5 gpd	500 gallons	Double-lined plastic tank
Hydraulic oil	Gas turbine hydraulic start system	Initial fill	Initial fill	50 gallons	Drums
Misc. lubricants	Lube oils, greases, etc.	< 50 gallons/month	< 50 gallons/month	5 and 55 gallons	Drums
Sulfur hexafluoride (SF_6)	Electrical insulator in the LMS100 generator breakers	Leakage rate per year < 0.0055%	Leakage rate per year < 0.0055%	40 kg	Four three-phase breakers
Polymer	HERO clarifier	None	33 gpd	6,000 gallons	Bulk storage tank
Coagulant	HERO clarifier	None	33 gpd	6,000 gallons	Bulk storage tank
Caustic	HERO weak acid cation inlet	None	16 gpd	400 gallons	Tote
Acid	HERO weak acid cation outlet	None	16 gpd	400 gallons	Tote
Antiscalant	HERO	None	8 gpd	400 gallons	Tote

Key:

gpd gallons per day
HERO high efficiency reverse osmosis
kg kilograms
lbs pounds
NO_X nitrogen oxides
SCR selective catalytic reduction
UL Underwriters Laboratories
ZLD zero liquid discharge