Chokecherry and Sierra Madre Wind Energy Project (WYW-167155) Right of Way Application

West Sinclair Rail Facility

Prepared for:

U.S. Bureau of Land Management
Rawlins Field Office

Submitted by:

Power Company of Wyoming LLC

March 2014

Power Company of Wyoming LLC

STANDARD FORM 299 (05/2009)
Prescribed by DOI/USDA/DOT
P.L. 96-487 and Federal
Register Notice 5-22-95

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

FORM APPROVED
OMB Control Number: 0596-0082
Expiration Date: 10/31/2012

FOR AGENCY USE ONLY

Application Number

Date Filed

NOTE: Before completing and filing the application, the applicant should completely review this package and schedule a preapplication meeting with representatives of the agency responsible for processing the application. Each agency may have specific and unique requirements to be met in preparing and processing the application. Many times, with the help of the agency representative, the application can be completed at the preapplication meeting.

1. Name and address of applicant *(include zip code)*	2. Name, title, and address of authorized agent if different from item 1 *(include zip code)*	3. Telephone (area code)
Power Company of Wyoming LLC 555 Seventeenth Street, Suite 2400 Denver, Colorado 80202	Garry L. Miller Vice President, Land and Environmental Affairs garry.miller@tac-denver.com	Applicant 303-298-1000 Authorized Agent 303-299-1546

4. As applicant are you? *(check one)*

a. ☐ Individual
b. ☐ Corporation*
c. ☒ Partnership/Association*
d. ☐ State Government/State Agency
e. ☐ Local Government
f. ☐ Federal Agency

** If checked, complete supplemental page*

5. Specify what application is for: *(check one)*

a. ☐ New authorization
b. ☐ Renewing existing authorization No.
c. ☐ Amend existing authorization No.
d. ☐ Assign existing authorization No.
e. ☐ Existing use for which no authorization has been received *
f. ☒ Other*

** If checked, provide details under item 7*

6. If an individual, or partnership are you a citizen(s) of the United States? ☒ Yes ☐ No

7. Project description (describe in detail): (a) Type of system or facility, *(e.g., canal, pipeline, road)*; (b) related structures and facilities; (c) physical specifications *(Length, width, grading, etc.)*; (d) term of years needed: (e) time of year of use or operation; (f) Volume or amount of product to be transported; (g) duration and timing of construction; and (h) temporary work areas needed for construction *(Attach additional sheets, if additional space is needed.)*

Power Company of Wyoming LLC (PCW or Applicant) is applying for a right-of-way grant to construct, operate, maintain, and decommission the West Sinclair Rail Facility portion of the Chokecherry and Sierra Madre Wind Energy Project (ROW Application No. WYW - 167155). The West Sinclair Rail Facility connects the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project) to the Union Pacific Railroad main line and includes multiple rail tracks and a rail loop with associated laydown areas. The West Sinclair Rail Facility is an integral part of the CCSM Project and will be in use for the life of the CCSM Project, thus a ROW grant is requested for the same 30 year period as the CCSM Project. The West Sinclair Rail Facility will be in use year round, primarily from May through September, to deliver the components needed for the construction, operation, maintenance, and decommissioning of the CCSM Project. Please refer to the attached site-specific plan of development (Attachment A) for further details and information concerning the CCSM Project, specifically the West Sinclair Rail Facility, including a map showing the location of the CCSM Project and the West Sinclair Facility.

8. Attach a map covering area and show location of project proposal

9. State or Local government approval: ☐ Attached ☒ Applied for ☐ Not Required

10. Nonreturnable application fee: ☒ Attached ☐ Not required

11. Does project cross international boundary or affect international waterways? ☐ Yes ☒ No *(if "yes," indicate on map)*

12. Give statement of your technical and financial capability to construct, operate, maintain, and terminate system for which authorization is being requested.

Power Company of Wyoming LLC is a limited liability company. PCW is a wholly owned subsidiary of The Anschutz Corporation (TAC). In turn, TAC is a 100% owned subsidiary of Anschutz Company (Anschutz), a privately held multi-billion dollar diversified company based in Denver, Colorado. The principal offices of PCW are located at 555 Seventeenth Street, Suite 2400, Denver, Colorado. PCW was formed to hold and develop certain electric generation assets for Anschutz. Please refer to Attachment A for further details and information.

13a. Describe other reasonable alternative routes and modes considered.

Please refer to Attachment A.

b. Why were these alternatives not selected?

Please refer to Attachment A.

c. Give explanation as t o why it is necessary to cross Federal Lands.

Please refer to Attachment A.

14. List authorizations and pending applications filed for similar projects which may provide information to the authorizing agency. *(Specify number, date, code, or name)*

Please refer to Attachment A.

15. Provide statement of need for project, including the economic feasibility and items such as: (a) cost of proposal (construction, operation, and maintenance); (b) estimated cost of next best alternative; and (c) expected public benefits.

Please refer to Attachment A.

16. Describe probable effects on the population in the area, including the social and economic aspects, and the rural lifestyles.

Please refer to Attachment A.

17. Describe likely environmental effects that the proposed project will have on: (a) air quality; (b) visual impact; (c) surface and ground water quality and quantity; (d) the control or structural change on any stream or other body of water; (e) existing noise levels; and (f) the surface of the land, including vegetation, permafrost, soil, and soil stability.

Please refer to Attachment A.

18. Describe the probable effects that the proposed project will have on (a) populations of fish, plantlife, wildlife, and marine life, including threatened and endangered species; and (b) marine mammals, including hunting, capturing, collecting, or killing these animals.

Please refer to Attachment A.

19. State whether any hazardous material, as defined in this paragraph, will be used, produced, transported or stored on or within the right-of-way or any of the right-of-way facilities, or used in the construction, operation, maintenance or termination of the right-of-way or any of its facilities. "Hazardous material" means any substance, pollutant or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any "hazardous waste" as defined in the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. 6901 et seq., and its regulations. The term hazardous materials also includes any nuclear or byproduct material as defined by the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCIA Section 101(14), 42 U.S.C. 9601(14), nor does the term include natural gas.

Please refer to Attachment A.

20. Name all the Department(s)/Agency(ies) where this application is being filed.

Bureau of Land Management, Rawlins Field Office, 1300 North Third, Rawlins, WY 82301.

I HEREBY CERTIFY, That I am of legal age and authorized to do business in the State and that I have personally examined the information contained in the application and believe that the information submitted is correct to the best of my knowledge.

Signature of Applicant	Date
	08/13/2013

Title 18, U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any matter within its jurisdiction.

GENERAL INFORMATION
ALASKA NATIONAL INTEREST LANDS

This application will be used when applying for a right-of-way, permit, license, lease, or certificate for the use of Federal lands which lie within conservation system units and National Recreation or Conservation Areas as defined in the Alaska National Interest lands Conservation Act. Conservation system units include the National Park System, National Wildlife Refuge System, National Wild and Scenic Rivers System, National Trails System, National Wilderness Preservation System, and National Forest Monuments.

Transportation and utility systems and facility uses for which the application may be used are:

1. Canals, ditches, flumes, laterals, pipes, pipelines, tunnels, and other systems for the transportation of water.

2. Pipelines and other systems for the transportation of liquids other than water, including oil, natural gas, synthetic liquid and gaseous fuels, and any refined product produced therefrom.

3. Pipelines, slurry and emulsion systems, and conveyor belts for transportation of solid materials.

4. Systems for the transmission and distribution of electric energy.

5. Systems for transmission or reception of radio, television, telephone, telegraph, and other electronic signals, and other means of communications.

6. Improved right-of-way for snow machines, air cushion vehicles, and all-terrain vehicles.

7. Roads, highways, railroads, tunnels, tramways, airports, landing strips, docks, and other systems of general transportation.

This application must be filed simultaneously with each Federal department or agency requiring authorization to establish and operate your proposal.

In Alaska, the following agencies will help the applicant file an application and identify the other agencies the applicant should contact and possibly file with:

Department of Agriculture
Regional Forester, Forest Service (USFS)
Federal Office Building,
P.O. Box 21628
Juneau, Alaska 99802-1628
Telephone: (907) 586-7847 *(or a local Forest Service Office)*

Department of the Interior
Bureau of Indian Affairs (BIA)
Juneau Area Office
Federal Building Annex
9109 Mendenhall Mall Road, Suite 5
Juneau, Alaska 99802
Telephone: (907) 586-7177

Department of the Interior
Bureau of Land Management
222 West 7th Avenue
P.O. Box 13
Anchorage, Alaska 99513-7599
Telephone: (907) 271-5477 (or a local BLM Office)

U.S. Fish & Wildlife Service (FWS)
Office of the Regional Director
1011 East Tudor Road
Anchorage, Alaska 99503
Telephone: (907) 786-3440

National Park Service (NPA)
Alaska Regional Office, 2225
Gambell St., Rm. 107
Anchorage, Alaska 99502-2892
Telephone: (907) 786-3440

Note - Filings with any Interior agency may be filed with any office noted above or with the Office of the Secretary of the Interior, Regional Environmental Office, P.O. Box 120, 1675 C Street, Anchorage, Alaska 9513.

Department of Transportation
Federal Aviation Administration
Alaska Region AAL-4, 222 West 7th Ave., Box 14
Anchorage, Alaska 99513-7587
Telephone: (907) 271-5285

NOTE - The Department of Transportation has established the above central filing point for agencies within that Department. Affected agencies are: Federal Aviation Administration (FAA), Coast Guard (USCG), Federal Highway Administration (FHWA), Federal Railroad Administration (FRA).

OTHER THAN ALASKA NATIONAL INTEREST LANDS

Use of this form is not limited to National Interest Conservation Lands of Alaska.

Individual department/agencies may authorize the use of this form by applicants for transportation and utility systems and facilities on other Federal lands outside those areas described above.

For proposals located outside of Alaska, applications will be filed at the local agency office or at a location specified by the responsible Federal agency.

SPECIFIC INSTRUCTIONS
(Items not listed are self-explanatory)

7 Attach preliminary site and facility construction plans. The responsible agency will provide instructions whenever specific plans are required.

8 Generally, the map must show the section(s), township(s), and range(s) within which the project is to be located. Show the proposed location of the project on the map as accurately as possible. Some agencies require detailed survey maps. The responsible agency will provide additional instructions.

9 , 10, and 12 The responsible agency will provide additional instructions.

13 Providing information on alternate routes and modes in as much detail as possible, discussing why certain routes or modes were rejected and why it is necessary to cross Federal lands will assist the agency(ies) in processing your application and reaching a final decision. Include only reasonable alternate routes and modes as related to current technology and economics.

14 The responsible agency will provide instructions.

15 Generally, a simple statement of the purpose of the proposal will be sufficient. However, major proposals located in critical or sensitive areas may require a full analysis with additional specific information. The responsible agency will provide additional instructions.

16 through 19 Providing this information is as much detail as possible will assist the Federal agency(ies) in processing the application and reaching a decision. When completing these items, you should use a sound judgment in furnishing relevant information. For example, if the project is not near a stream or other body of water, do not address this subject. The responsible agency will provide additional instructions.

Application must be signed by the applicant or applicant's authorized representative.

EFFECT OF NOT PROVIDING INFORMATION: Disclosure of the information is voluntary. If all the information is not provided, the application may be rejected.

DATA COLLECTION STATEMENT

The Federal agencies collect this information from applicants requesting right-of-way, permit, license, lease, or certification for the use of Federal lands. The Federal agencies use this information to evaluate the applicant's proposal. The public is obligated to submit this form if they wish to obtain permission to use Federal lands.

SUPPLEMENTAL		
NOTE: The responsible agency(ies) will provide instructions	CHECK APPROPRIATE BLOCK	
I - PRIVATE CORPORATIONS	ATTACHED	FILED*
a. Articles of Incorporation	☐	☐
b. Corporation Bylaws	☐	☐
c. A certification from the State showing the corporation is in good standing and is entitled to operate within the State	☐	☐
d Copy of resolution authorizing filing	☐	☐
e. The name and address of each shareholder owning 3 percent or more of the shares, together with the number and percentage of any class of voting shares of the entity which such shareholder is authorized to vote and the name and address of each affiliate of the entity together with, in the case of an affiliate controlled by the entity, the number of shares and the percentage of any class of voting stock of that affiliate owned, directly or indirectly, by that entity, and in the case of an affiliate which controls that entity, the number of shares and the percentage of any class of voting stock of that entity owned, directly or indirectly, by the affiliate.	☐	☐
f. If application is for an oil or gas pipeline, describe any related right- of-way or temporary use permit applications, and identify previous applications.	☐	☐
g. If application is for an oil and gas pipeline, identify all Federal lands by agency impacted by proposal.	☐	☐
II - PUBLIC CORPORATIONS		
a. Copy of law forming corporation	☐	☐
b. Proof of organization	☐	☐
c. Copy of Bylaws	☐	☐
d. Copy of resolution authorizing filing	☐	☐
e. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐
III - PARTNERSHIP OR OTHER UNINCORPORATED ENTITY		
a. Articles of association, if any	☐	☒
b. If one partner is authorized to sign, resolution authorizing action is	☐	☒
c. Name and address of each participant, partner, association, or other	☐	☒
d. If application is for an oil or gas pipeline, provide information required by item "I - f" and "I - g" above.	☐	☐

*If the required information is already filed with the agency processing this application and is current, check block entitled "Filed." Provide the file identification information *(e.g., number, date, code, name)*. If not on file or current, attach the requested information.

NOTICES

Note: This applies to the Department of Agriculture/Forest Service (FS)

This information is needed by the Forest Service to evaluate the requests to use National Forest System lands and manage those lands to protect natural resources, administer the use, and ensure public health and safety. This information is required to obtain or retain a benefit. The authority for that requirement is provided by the Organic Act of 1897 and the Federal Land Policy and Management Act of 1976, which authorize the secretary of Agriculture to promulgate rules and regulations for authorizing and managing National Forest System lands. These statutes, along with the Term Permit Act, National Forest Ski Area Permit Act, Granger-Thye Act, Mineral Leasing Act, Alaska Term Permit Act, Act of September 3, 1954, Wilderness Act, National Forest Roads and Trails Act, Act of November 16, 1973, Archeological Resources Protection Act, and Alaska National Interest Lands Conservation Act, authorize the Secretary of Agriculture to issue authorizations or the use and occupancy of National Forest System lands. The Secretary of Agriculture's regulations at 36 CFR Part 251, Subpart B, establish procedures for issuing those authorizations.

BURDEN AND NONDISCRIMINATION STATEMENTS

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0082. The time required to complete this information collection is estimated to average 8 hours hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720- 2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call toll free (866) 632-9992 (voice). TDD users can contact USDA through local relay or the Federal relay at (800) 877-8339 (TDD) or (866) 377-8642 (relay voice). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

APPLICATION FOR TRANSPORTATION AND UTILITY SYSTEMS AND FACILITIES ON FEDERAL LANDS

Standard Form 299

Chokecherry and Sierra Madre Wind Energy Project

West Sinclair Rail Facility

ATTACHMENT A

Submitted By:
Power Company of Wyoming LLC
555 Seventeenth Street, Suite 2400
Denver, Colorado 80202

Submitted To:
Bureau of Land Management
Rawlins Field Office
1300 N. Third
Rawlins, Wyoming 82301

West Sinclair Rail Facility
Site-Specific Plan of Development

Prepared for:
US Bureau of Land Management, Rawlins Field Office

Submitted by:
Power Company of Wyoming LLC

March 24, 2014

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Acronyms and Abbreviations

ac	acre or acres
ac-ft	acre-feet
BLM	Bureau of Land Management
CCSM	Chokecherry and Sierra Madre
CCSM Phase I	Phase I of the CCSM Project
CCSM Phase II	Phase II of the CCSM Project
CCSM Project Site	Chokecherry and Sierra Madre project site
cy	cubic yard
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	feet or foot
mph	miles per hour
MW	megawatt or megawatts
NRHP	National Register for Historic Places
O&M	operations and maintenance
OTM	other track material
PCW	Power Company of Wyoming LLC
PFYC	potential fossil yield classification
Rail Facility	West Sinclair Rail Facility
ROD	Record of Decision
ROW	right-of-way
SEO	State Engineer's Office
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SSS	special status species
SWCA	SWCA Environmental Consultants
SWPP Plan	Storm Water Pollution Prevention Plan
TOTCO	The Overland Trail Cattle Company LLC
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
WGFD	Wyoming Game and Fish Department

1. CCSM Project Overview

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain, and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The CCSM Project has a proposed life of 30 years after which, subject to market conditions, the CCSM Project may be repowered as necessary to continue its operations. The CCSM Project will provide enough electricity to power more than 790,000 households, resulting in a reduction in CO_2 emissions of 7 to 11 million tons per year.[1]

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch), as shown on Figure 1-1. The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO, and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office. A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

PCW has control of the lands necessary to develop the CCSM Project. PCW has an easement from TOTCO for development of the CCSM Project on TOTCO's private land and a lease from TOTCO for operation of the Quarry. PCW and Anadarko have executed an agreement relating to Anadarko lands where the Rail Facility will be located. PCW has a special use lease from the State of Wyoming, Board of Land Commissioners to use certain state lands for the CCSM Project. PCW has also received a Conditional Use Permit from Carbon County for the construction, operation, maintenance, and decommissioning of the CCSM Project.

In 2008, PCW applied to BLM for right-of-way (ROW) grants to construct, operate, maintain, and decommission the CCSM Project on federal land within the CCSM Project Area (Figure 1-1). On June 29, 2012, the Notice of Availability for the Final Environmental Impact Statement (EIS) concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012, the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres (ac) within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD.

[1] This estimate assumes that wind generation is displacing traditional coal generation and that coal generation produces average emissions of 1,050 tons of CO_2 per gigawatt-hour (EIA 2011, Tables A8 and A18).

Prior to issuing ROW grants, BLM committed to conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development submitted by PCW will be screened against the analysis conducted in the EIS and the requirements of the ROD. PCW anticipates submitting five site-specific plans of development, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

If required by BLM, the Phase I and Phase II Wind Development site-specific plans of development may be divided by wind development area (i.e. Chokecherry and Sierra Madre) to create a total of seven (7) site-specific plans of development.

Pursuant to the SF-299, submitted herewith, PCW requests a ROW grant from BLM to construct, operate, maintain, and decommission the West Sinclair Rail Facility (Rail Facility), an integral component of the CCSM Project. The requested ROW grant is for a term of 30 years with the option to renew the ROW grant and upgrade the Rail Facility, as needed. This site-specific plan of development is submitted in compliance with BLM guidance on processing ROW applications for wind energy projects on lands administered by BLM (BLM 2008b), the EIS (BLM 2012a) and ROD (BLM 2012b).

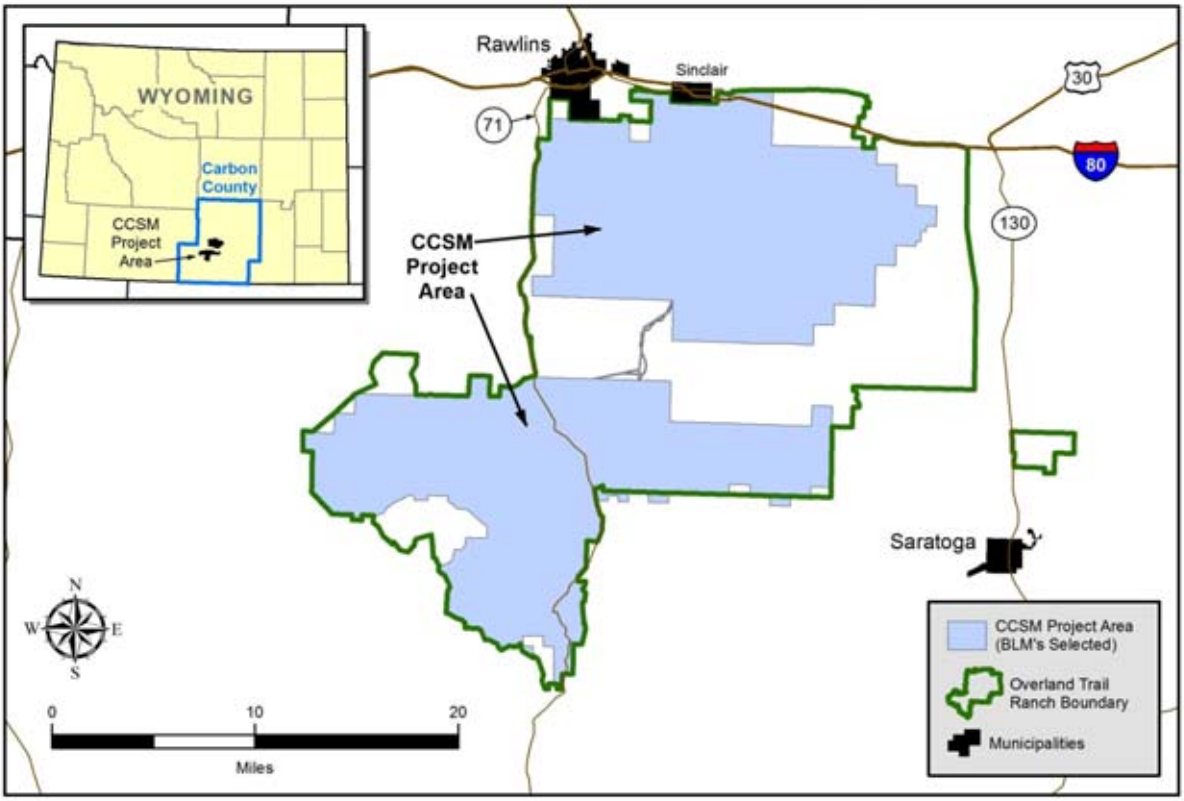

Figure 1-1 CCSM Project Area

1.1 CCSM Project Location

Figure 1-2 shows the CCSM Project Site and land ownership. As shown on Figure 2-2, the CCSM Project Site is the CCSM Project Area expressly:

(1) excluding any part of the designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3);
(2) excluding any part of the Red-Rim Grizzly Wildlife Habitat Management Area identified by BLM in the ROD for the CCSM Project signed October 9, 2012 (BLM 2012b);
(3) including portions of Sections 25 and 36 of Township 21 N, Range 87 W of the 6th P.M, Carbon County, Wyoming where the West Sincalir Rail Facility Site will be located;
(4) including portions of Section 3, Township 18N, Range 88W of the 6th P.M, Carbon County, Wyoming within the County Road 505W right-of-way where a water line is located; and
(5) including portions of Sections 25 and 36, Township 19N, Range 87W of the 6th P.M, Carbon County, Wyoming to accommodate the final alignment of the Haul Road.

Consistent with the ROD, the CCSM Project Site includes off-site access on 460 acres and two (2) wind turbine development areas: "Chokecherry" is the northern wind development area and "Sierra Madre" is the southern wind development area. PCW will install wind turbines only within the two (2) wind development areas and not elsewhere within the CCSM Project Site.

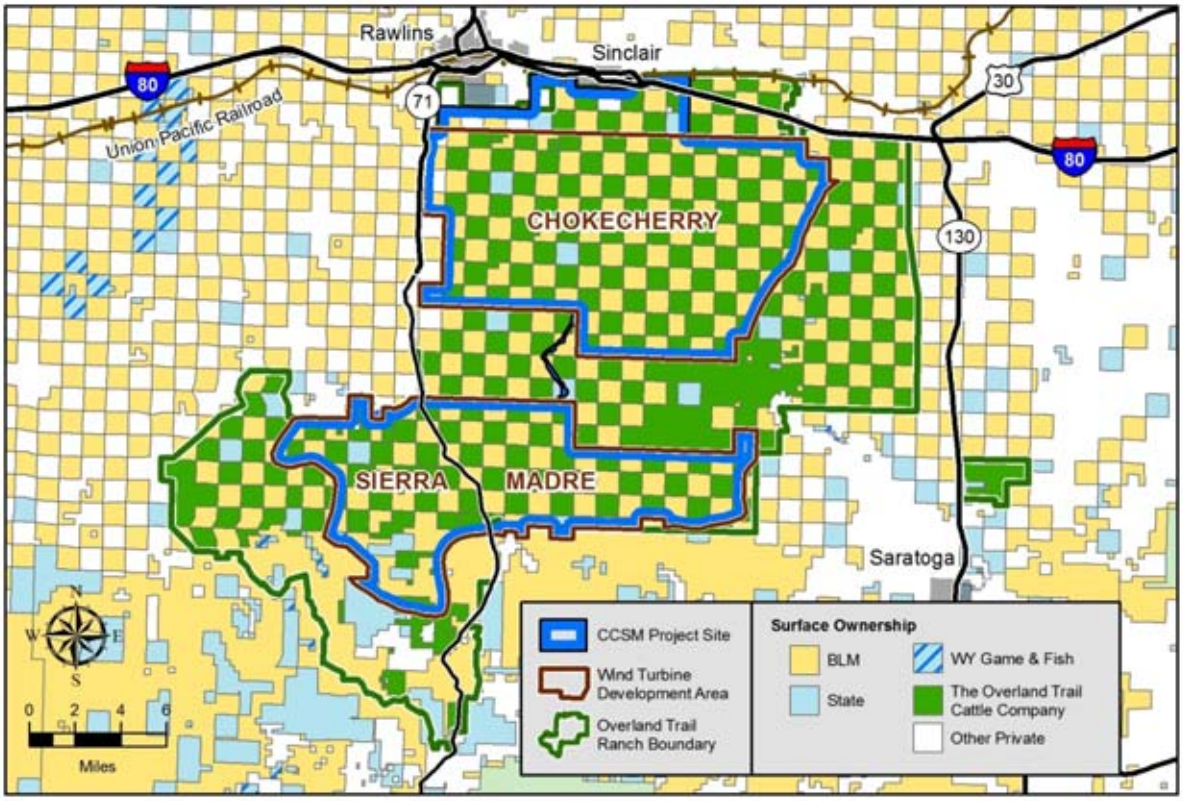

Figure 1-2 CCSM Project Site and Land Ownership

1.2 PCW's Objectives for the CCSM Project

PCW is developing the CCSM Project to help fulfill the projected need for power from renewable energy resources in the Desert Southwest market at competitive rates. There is a strong market for the CCSM Project's wind energy due to state mandates in California, Nevada, and Arizona to use renewable energy (Renewable Portfolio Standards or RPS) and due to the growing recognition that there are numerous benefits to using geographically diverse renewable resources – such as smoothing out grid operations and lower electricity rates. The CCSM Project is uniquely aligned to serve this demand because of the CCSM Project Site's exceptional wind resources – the best onshore winds in the nation. This wind power potential was modeled by AWS Truewind Solutions and validated by the U.S. Department of Energy's National Renewable Energy Laboratory as Class 5 (excellent), Class 6 (outstanding), or Class 7 (superb).

PCW has determined that the optimum project consists of 1,000 wind turbines with an installed capacity of between 2,000 and 3,000 MW that will extract the maximum potential from the wind energy on the CCSM Project Site. Developing the areas with the highest wind resource first and constructing the CCSM Project on an optimized schedule also directly affects

economics. The CCSM Project is designed to achieve a balance between renewable energy demands, economics, and environmental sensitivities.

PCW's objectives for the CCSM Project are:

1. Extracting the maximum potential wind energy from the site;
2. Developing a 1,000 wind turbine project with an installed capacity of between 2,000 MW and 3,000 MW;
3. Developing the highest wind energy potential areas first; and
4. Constructing the CCSM Project as rapidly as possible on an optimized schedule.

Each element of PCW's objectives is described in detail in the Plan of Development for the CCSM Project (PCW 2012). The BLM determined in the ROD that over 200,000 ac of the CCSM Project Area are suitable for wind energy development and that the Selected Alternative meets BLM's purpose and need and takes into account PCW's objectives (BLM 2012a).

1.3 Federal Approvals

In 2008, PCW applied to BLM for ROW grants to construct, operate, maintain, and decommission the CCSM Project on federal lands within the CCSM Project Area. Over the next four years, BLM conducted extensive public scoping, performed numerous studies and surveys, analyzed multiple alternatives and prepared a Draft EIS for the CCSM Project, which was published for public comment on July 22, 2011. BLM took the next year to review and incorporate public comments on the Draft EIS and further refine its analysis. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012, the Secretary of the Interior signed the ROD for the CCSM Project. In the ROD, BLM determined that 219,707 ac are suitable for wind energy development and associated facilities on federal land - consisting of the 109,086-ac Chokecherry site and the 110,161-ac SM site and offsite access on 460 ac - subject to the requirements as described under the Selected Alternative in the ROD.

Prior to issuing ROW grants, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Then, prior to issuing ROW grants, BLM will conduct the appropriate level of additional environmental analyses tiering to the EIS and decisions outlined in the ROD. Future siting of wind turbine generators and associated site-specific plans of developments will be submitted consistent with the strategy adopted in the ROD. See Appendix C of the ROD, which contains a detailed description and flow chart regarding the National Environmental Policy Act tiering procedure to be used.

The timing and order of the submission of the site-specific plans of development to BLM will align with PCW's plan to develop the CCSM Project in two phases. Phase I requires the

installation of a nameplate capacity of at least 1,500 MW of wind energy generation facilities (approximately 500 turbines). Construction of Phase I of the CCSM Project (CCSM Phase I) is anticipated to begin in late 2014. Completion of construction of CCSM Phase I is anticipated for 2018. Construction of Phase II of the CCSM Project (CCSM Phase II), consisting of development of the remainder of the CCSM Project, is anticipated to follow completion of Phase I.

PCW anticipates submitting five (5) site-specific plans of development, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

If required by BLM, the Phase I and Phase II Wind Development site-specific plans of development may be divided by wind development area (i.e. Chokecherry and Sierra Madre) to create a total of seven (7) site-specific plans of development.

Each site-specific plan of development will contain engineering and natural resource data describing site-specific conditions and activities in the detail necessary to allow BLM to evaluate and analyze site-specific impacts. Appropriate avoidance, minimization, and mitigation measures have been applied consistent with the ROD (Appendix A).

2. Rail Facility Overview

PCW requests a ROW grant from BLM to construct, operate, maintain and decommission the Rail Facility, an integral component of the CCSM Project. The Rail Facility allows for rail delivery of materials and components necessary for the construction, operation, maintenance, and decommissioning of the CCSM Project to the CCSM Project Site. The Rail Facility connects the CCSM Project to the Union Pacific Railroad (UPRR) main line, reducing the volume of deliveries that must occur by truck and minimizing impacts to public roads.

The Rail Facility is a multi-modal facility, meaning it can receive and store components and material delivered by both rail and truck. During each year of the CCSM Project, components and materials will be scheduled, received, stored, and reloaded onto trucks for delivery to the various areas across the CCSM Project.

PCW is required to obtain final approval of the Rail Facility design from Union Pacific due to the connection of the Rail Facility with the UPRR main line. The Rail Facility has been reviewed by Union Pacific through its design review process; Union Pacific has approved both the 30 percent design and the 70 percent design. PCW will obtain approval of the final design for the Rail Facility from Union Pacific prior to construction. Significant modifications to the Rail Facility are not anticipated to result from Union Pacific's final review.

The Rail Facility Site is located southwest of Sinclair, Wyoming along the northern boundary of the CCSM Project Site (Figure 2-1). The Rail Facility consists of approximately 14 miles of track, along with up to 181 ac of laydown for material and component storage; 2.6 miles of track and 56 ac of laydown are located on federal lands with the remainder on private lands (Figure 2-2). The components of the Rail Facility are described in detail in section 4.

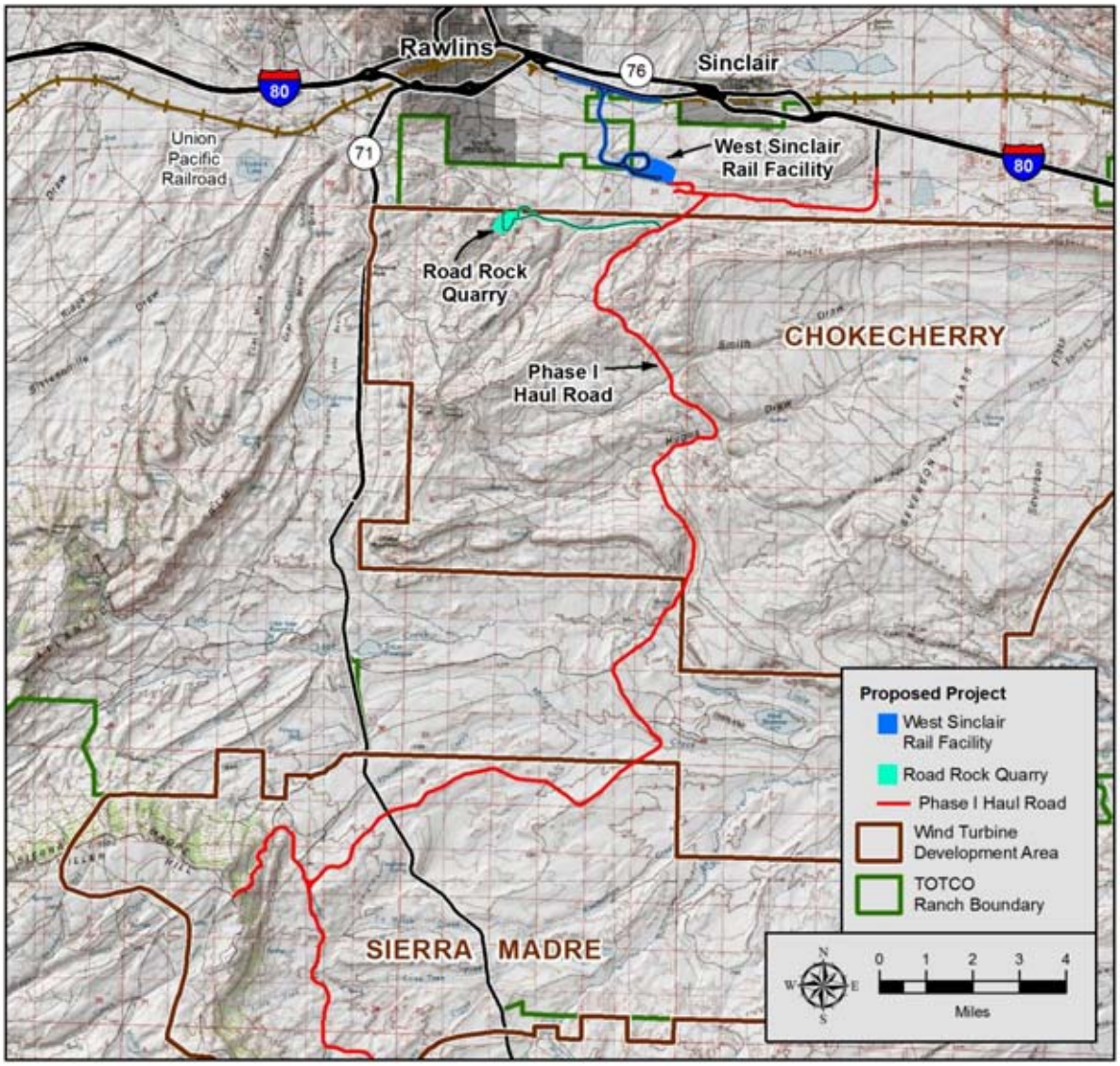

Figure 2-1 Rail Facility Location Overview

2.1 Rail Facility Location

The Rail Facility is located south of Interstate 80 in Sections 23, 24, 25 and 36 of Township 21 N, Range 87 W of the Sixth Principal Meridian and Sections 19, 30, 31 and 32 of Township 21 N, Range 86 W of the Sixth Principal Meridian, in Carbon County, Wyoming (Figure 2-2). The EIS analyzed rail facilities located both north and south of Interstate 80; BLM chose a location south of Interstate 80 as the Selected Alternative due to reduced socioeconomic and transportation impacts (BLM 2012b). The Rail Facility described in this site-specific plan of development is located south of Interstate 80 and to the west of the rail facility evaluated in the EIS (Figure 2-3); this expands the area analyzed in the EIS by the addition of private lands in the aforementioned Sections 24 and 25, and state lands in Section 36, but eliminates impacts to

private lands in Sections 19 and 29 of Township 21 N, Range 88 W. As with the Selected Alternative, the Rail Facility continues to use federal lands in Section 30.

Following issuance of the ROD, PCW continued to optimize the Rail Facility to provide for operational efficiencies while minimizing environmental effects. PCW also sought a balance between construction costs and long-term operation and maintenance costs. For instance, moving the Wye connection with the UPRR main line approximately two (2) miles west allows for train traffic on the main line to operate more efficiently. In addition, the Rail Facility uses a loop track that will allow trains delivering components and materials to the Rail Facility to exit and enter the UPRR main line in a manner that minimizes disruption to traffic on the UPRR main line. Acres of long-term disturbance are 121 for the Rail Facility (including associated manifest yard) as compared to 250 for the rail facility analyzed in the EIS.

In sum, the ecological setting of the Rail Facility proposed in this site-specific plan of development is similar to that of the rail facility analyzed in the EIS. Therefore, although the site of the Rail Facility has been adjusted from the Selected Alternative, its continued location south of Interstate 80 conforms to the ROD's reasoning regarding the location of the Rail Facility to mitigate concerns regarding access and construction traffic and the conclusion in the EIS that the use of a rail facility mitigates transportation related impacts from the CCSM Project (BLM 2012a).

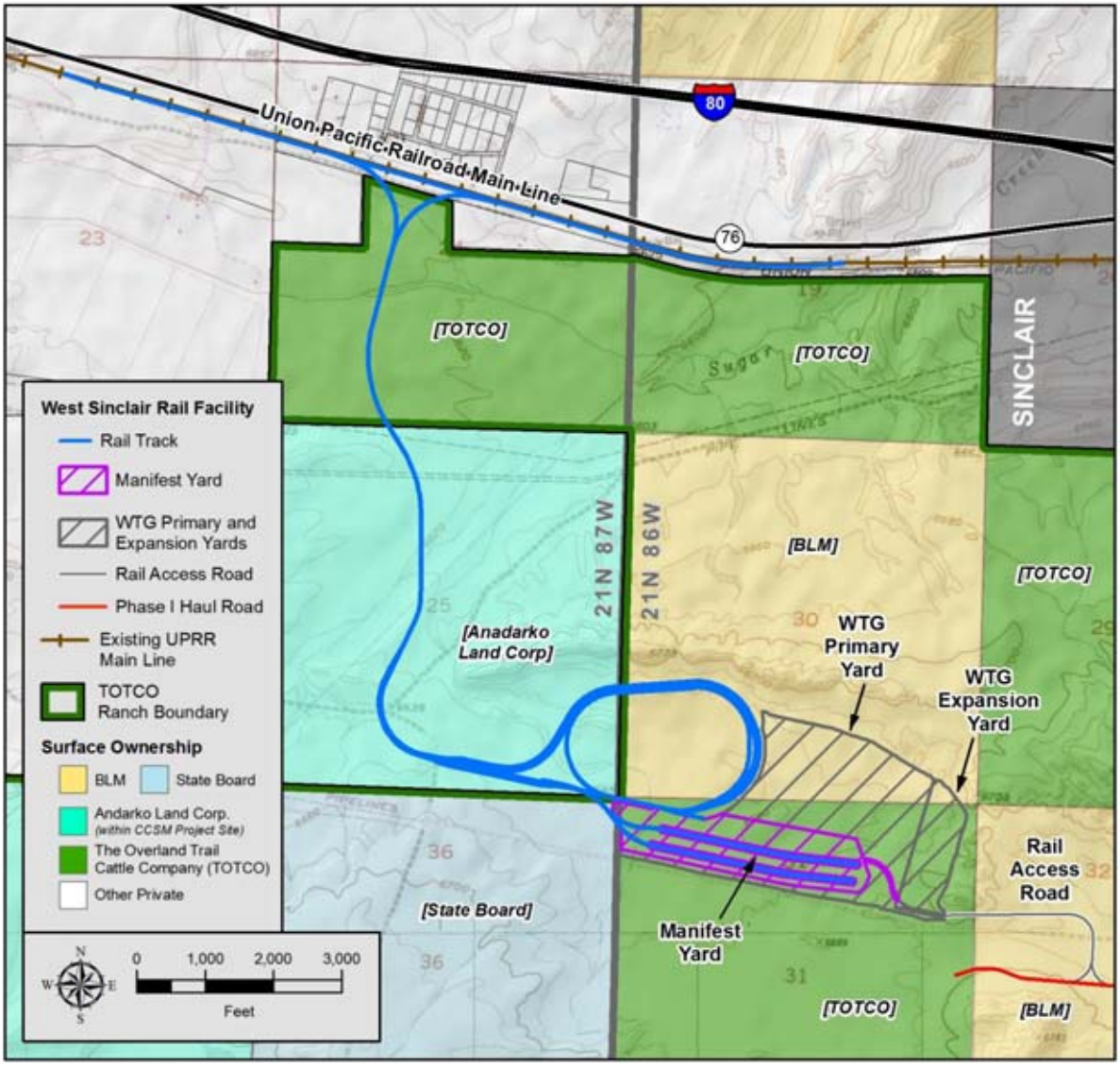

Figure 2-2 Rail Facility Land Ownership

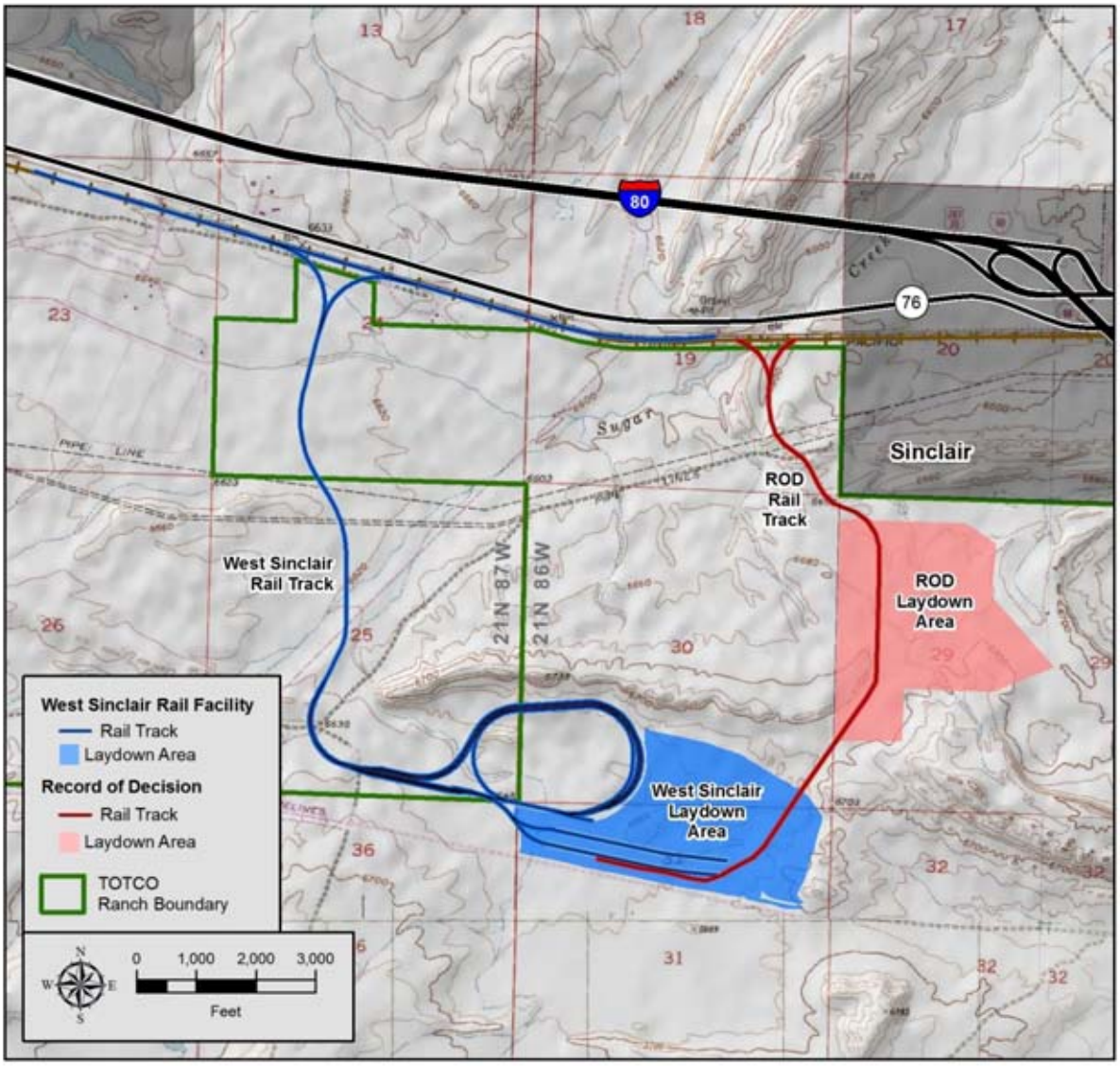

Figure 2-3 Rail Facility Location Comparison

2.2 PCW's Objectives for the Rail Facility

PCW is developing the Rail Facility to support the construction, operation, maintenance and decommissioning of the CCSM Project. The CCSM Project requires the transportation, storage, and handling of a large number of turbine components and a substantial amount of material (Appendix D). The CCSM Project Site is located adjacent to the UPRR main line and Interstate 80, providing a unique opportunity to enhance the CCSM Project's efficiency while reducing transportation and traffic impacts. PCW evaluated existing facilities along the UPRR main line; however, no suitable facilities were identified in close proximity to the CCSM Project. Therefore, PCW determined that it would be necessary to develop a Rail Facility specifically for the CCSM Project.

A well-planned and flexible rail facility and laydown yards is critical to the efficient construction, operation, maintenance, and decommissioning of the CCSM Project. PCW determined that a new rail facility able to accommodate up to three (3) unit trains onsite at one time, process and unload up to four (4) unit trains per week, and store up to 150 complete wind turbines (or about 1,500 large turbine components) was necessary to meet the needs of the CCSM Project. While other materials and components may arrive by train, the most complex logistical element is the delivery of wind turbine components. PCW further determined that the optimum rail facility consists of three (3) unloading tracks and four (4) staging tracks configured in a hybrid loop/multi-siding arrangement with up to 180 ac of laydown yards. This design balances component and material delivery requirements with the investment required to construct the Rail Facility. PCW has designed the Rail Facility to meet the CCSM Project demand, as well as to comply with the requirements set forth by Union Pacific, the operator of the UPRR main line.

PCW's objectives for the Rail Facility are:

1. Develop a Rail Facility that will support the CCSM Project component and material delivery requirements (i.e., able to accommodate three (3) unit trains at once, unload four (4) unit trains in a week, and store 1,500 turbine components);
2. Develop a Rail Facility that meets Union Pacific's design requirements; and
3. Develop a Rail Facility that supports the demands of the CCSM Project while balancing the long-term investment required to build the Rail Facility.

The EIS recognizes that the use of a rail facility to support the CCSM Project is beneficial to mitigate transportation related impacts from the CCSM Project with few adverse impacts on the UPRR system (BLM 2012a). A rail facility was incorporated into all of the action alternatives analyzed in the EIS (BLM 2012a) and was included in the Selected Alternative in the ROD (BLM 2012b).

3. Rail Facility Execution and Resource Use

Construction of the Rail Facility will begin in 2014 and be completed in 2016 to support construction, operation, maintenance, and decommissioning of the CCSM Project. The CCSM Project construction schedule and the associated resource use are summarized below to assist in the evaluation of the Rail Facility in the context of the CCSM Project as a whole. The estimated resource usages for the Rail Facility and the remainder of the CCSM Project are included in the following sections for comparison to the resource use analyzed in the EIS.

3.1 Construction Schedule

PCW will construct the CCSM Project in two (2) phases, as described in section 1.3. CCSM Phase I is anticipated to begin in late 2014 and be complete in 2018. CCSM Phase II is anticipated to follow completion of CCSM Phase I.

PCW will construct CCSM Phase I over a five (5) year period (Table 3-1). The CCSM Phase I schedule is designed to first open the CCSM Project Site to road and rail access, then establish the onsite quarry, and finally proceed with wind turbine construction. In accordance with PCW objective number three for the CCSM Project, developing the highest wind energy potential areas first, Phase I of the Sierra Madre wind development area will be constructed first followed by Phase I of the Chokecherry wind development area. PCW anticipates the installation of 229 turbines in 2017 and another 271 turbines in 2018. Similar to Phase I, the wind turbines and associated infrastructure for Phase II will be constructed over a three year period, with the wind turbines installed during the last two years.

Table 3-1. CCSM Phase I Construction Schedule

Facility	2014	2015	2016	2017	2018
Phase I Haul Road and Facilities					
Haul roads	3.5 miles	28.5 miles			
Other roads[1]	3.1 miles	21.8 miles			
Laydown yards	North	Chokecherry Basin W. Deadman Miller Hill			
Water facilities	McCarthy	River Extraction Smith Draw Pine Grove			
West Sinclair Rail Facility					
Rail Facility		Construct	Construct	Operate	Operate
Access road	Construct				
Laydown yards		Construct	Construct	Operate	Operate
Road Rock Quarry					
Quarry	Construct	Mobilize & Operate	Operate	Operate	Operate
Access road	Construct				
Phase I Wind Development Area					
Arterial roads			15.1 miles	15.4 miles	12.9 miles
Turbine roads			57.3 miles	39.1 miles	27.3 miles

Facility	2014	2015	2016	2017	2018
Facility roads			1.1 miles	0.4 miles	0.7 miles
Transmission roads			0 miles	0 miles	0 miles
Turbine pads			229	159	112
Turbine foundations			157	231	112
Turbine installation				229	271
Laydown Yards			North (expand) Miller Hill (expand) E. Deadman	Smith Draw	
Facilities				Operations Center, Sierra Madre Maintenance Center	Chokecherry Maintenance Center
Substations				Interconnect, Pine Grove, McCarthy	Smith Draw, Nevins Valley

Notes:
1. Other roads include arterial, turbine and facility class roads

Reclamation activities associated with CCSM Phase I construction will extend beyond 2018.

3.2 Labor

The EIS evaluated the impacts associated with the CCSM Project workforce. For the construction stage of the CCSM Project, the EIS analyzed a peak workforce of 1,200 workers. The current CCSM Project workforce estimates reflect a reduced peak construction workforce of 945 workers.

For the West Sinclair Rail Facility portion of the CCSM Project, construction is anticipated to begin in 2014 and be complete by 2016. The workforce required to construct the West Sinclair Rail Facility is anticipated to peak at 96 workers in 2016. After 2016 and for the remainder of the CCSM Project construction, a workforce of up to 147 workers will operate the Rail Facility which will include offloading trains, storing components and materials in laydown yards, and delivering those components and materials to their installation sites in the CCSM Project. Table 3-2 and Figure 3-1 detail the CCSM Project construction workforce, as well as the portion specifically supporting construction and operation of the West Sinclair Rail Facility during the CCSM Project construction.

Table 3-2. CCSM Project Construction Workforce Breakdown

Year	*EIS Analysis*	Current CCSM Project Estimate	
	Total Project Peak Workforce	Total Project Peak Workforce	West Sinclair Rail Facility
2014	*N/A*	84	16
2015	*300*	255	87
2016	*400*	390	96
2017	*1,200*	945	147
2018	*1,200*	883	147
2019	*1,000*	301	30
2020	*N/A*	925	147
2021	*N/A*	881	147
PEAK	***1,200***	**945**	**147**

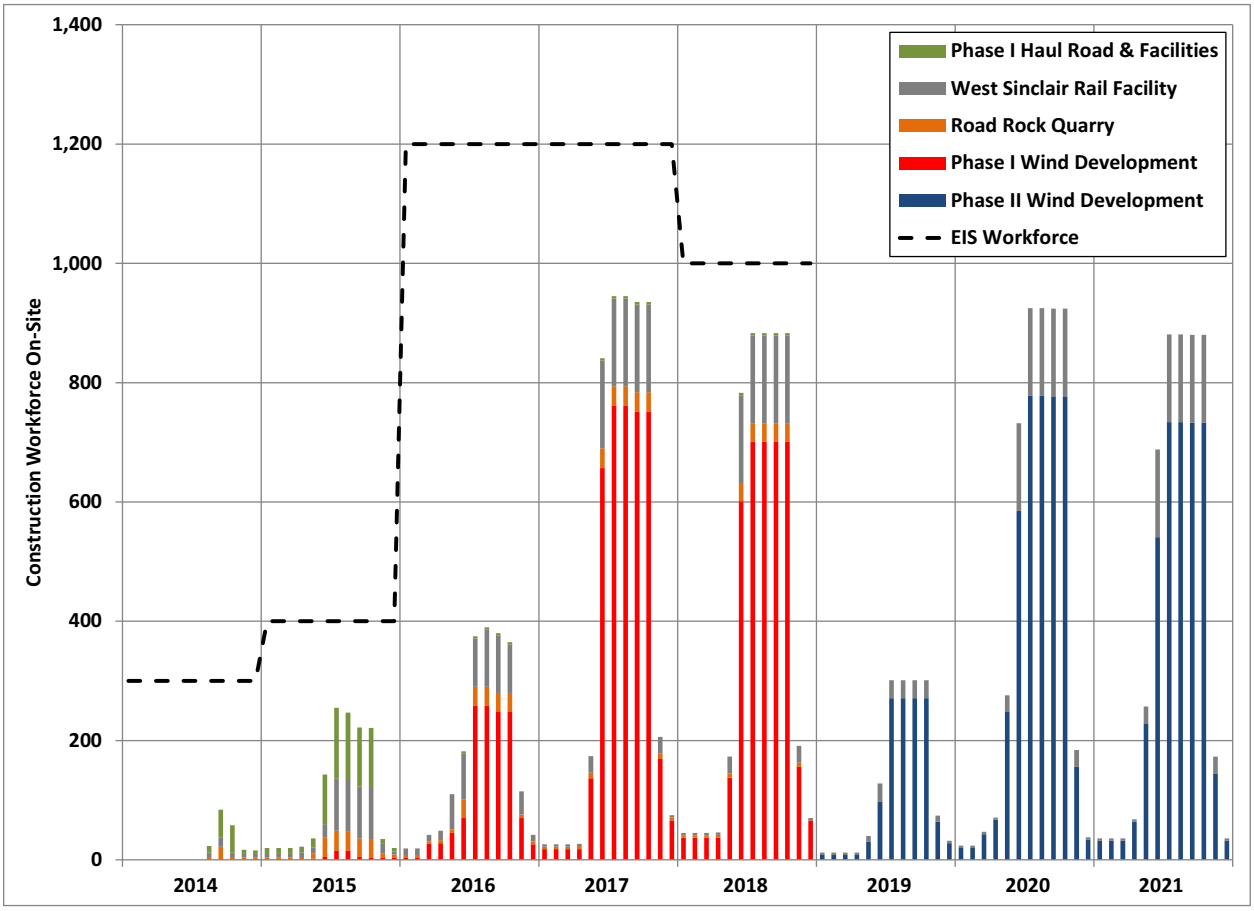

Figure 3-1. CCSM Project Construction Workforce

For the operations stage of the CCSM Project, the EIS evaluated the impacts of a workforce of 158 workers. The CCSM Project operations workforce will be brought on-site gradually as construction is completed. At the completion of Phase I construction, PCW is currently estimating that the CCSM Project's operations workforce will consist of 64 workers. Following construction of Phase II of the CCSM Project, the operations workforce is anticipated to grow to 114 workers. During operations of the CCSM Project, the Rail facility will be operated as needed; as such, the Rail Facility operations workforce is integrated into the CCSM project workforce estimate. Table 3-3 and Figure 3-2 summarize the overall CCSM Project operations workforce.

Table 3-3. CCSM Project Operations Workforce Buildup

Year	*EIS Analysis* *Total Project Workforce*	Current CCSM Project Plan Total Project Workforce
2014	*158*	0
2015		0
2016		0
2017		40
2018		64
2019		64
2020		89
2021		114
PEAK	***158***	**114**

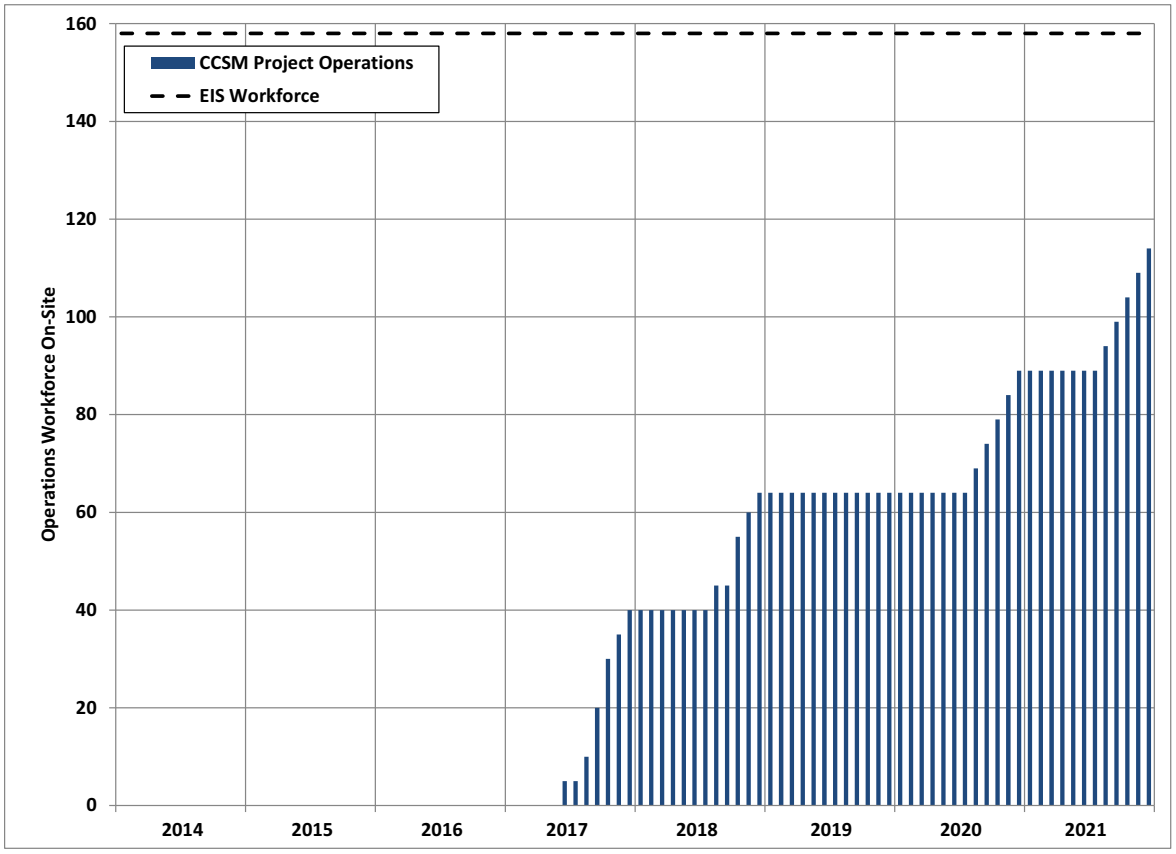

Figure 3-2. CCSM Project Operations Workforce

To decommission the CCSM Project, the EIS evaluated a workforce of up to 400 workers. PCW currently estimates the peak decommissioning workforce at 396, including the workforce necessary to decommission the Rail Facility. Table 3-4 and Figure 3-3 summarize the CCSM Project decommissioning workforce.

Table 3-4 CCSM Project Decommissioning Workforce Estimate

Year	*EIS Analysis* *Total Project Peak Workforce*	Current CCSM Project Plan Total Project Peak Workforce
Year 1	*400*	387
Year 2	*400*	396
Year 3	*400*	385
PEAK	***400***	**396**

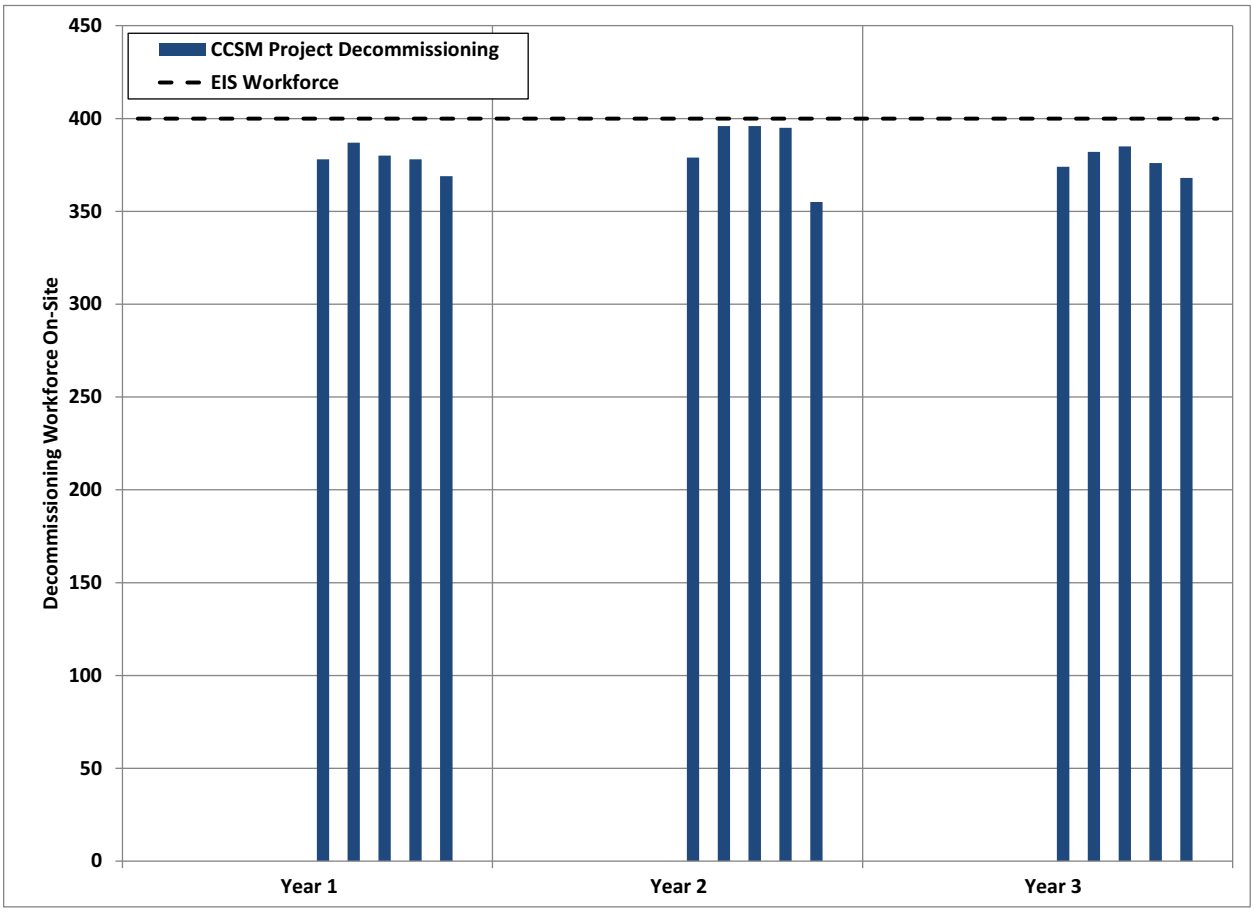

Figure 3-3. CCSM Project Decommissioning Workforce

3.3 Equipment

PCW has estimated the amount of equipment required to construct, operate, maintain, and decommission the CCSM Project. The estimated annual peak amount of equipment for the CCSM Project is shown in Table 3-5 and Figure 3-4 below. The specific types of equipment and the number of each required for the Rail Facility are provided in section 5.4.

Table 3-5. Peak Construction Equipment Estimate

Year	General Pick-Ups		Other Equipment		Total Equipment	
	EIS	Current	EIS	Current	EIS	Current
2014	*200*	31	*200*	43	*400*	74
2015	*350*	92	*200*	164	*550*	256
2016	*850*	151	*400*	183	*1,250*	334
2017	*900*	347	*450*	451	*1,350*	798
2018	*750*	314	*300*	414	*1,050*	728
2019	*N/A*	125	*N/A*	221	*N/A*	346
2020	*N/A*	352	*N/A*	494	*N/A*	846
2021	*N/A*	316	*N/A*	464	*N/A*	780
Operations and Maintenance	N/A	60	N/A	10	N/A	70
Decommissioning	N/A	230	N/A	150	N/A	380

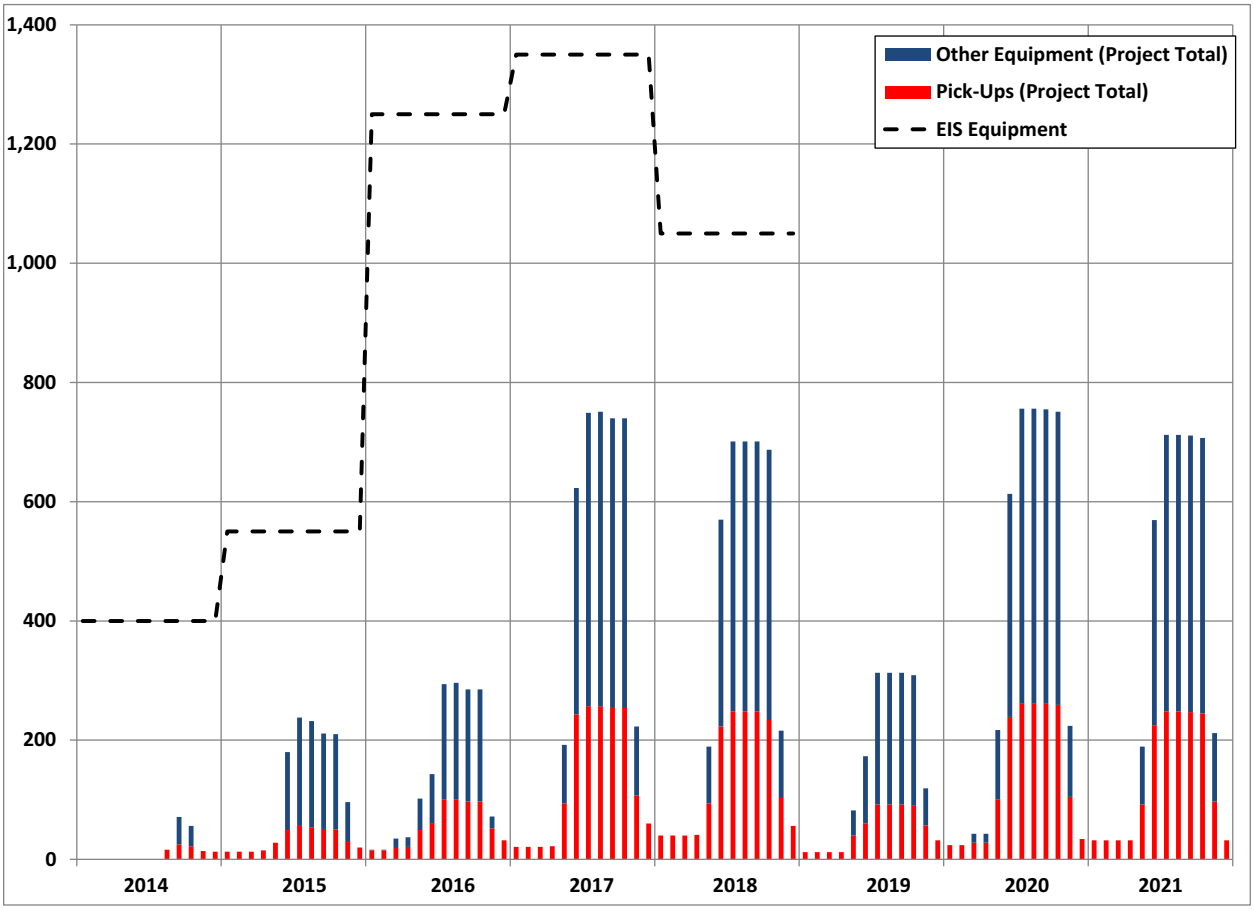

Figure 3-4. Peak Equipment During Construction

3.4 Material

The primary material required to construct the Rail Facility is aggregate. PCW estimates that the amount of aggregate required to build the entire CCSM Project is 2,700,000 cubic yards (cy), as shown in Table 3-6 and Figure 3-5. The EIS analyzed 2,800,000 cy of material. The aggregate will be obtained both on-site and from nearby commercial sources. Aggregate is also required to operate and maintain the CCSM Project; however, the annual amount required is anticipated to be minimal. Aggregate will be removed as part of the decommissioning process, thus no additional aggregate will be required for decommissioning.

Table 3-6. CCSM Project Construction Aggregate Estimate

Year	Source		Requirements	
	On-site (cy)	Off-site (cy)	CCSM Project TOTAL (cy)	Rail Facility (cy)
2014	0	36,000	36,000	2,000
2015	489,000	134,000	623,000	25,000
2016	570,000	348,000	918,000	570,000
2017	168,000	28,000	196,000	0
2018	107,000	23,000	130,000	**0**
PHASE I TOTAL	**1,334,000**	**569,000**	**1,903,000**	**597,000**
Phase II Year 1	300,000	62,000	362,000	0
Phase II Year 2	233,000	39,000	272,000	0
Phase II Year 3	142,000	46,000	188,000	0
PHASE II TOTAL	675,000	147,000	822,000	**0**
CCSM PROJECT TOTAL	**2,009,000**	**716,000**	**2,725,000**	**597,000**

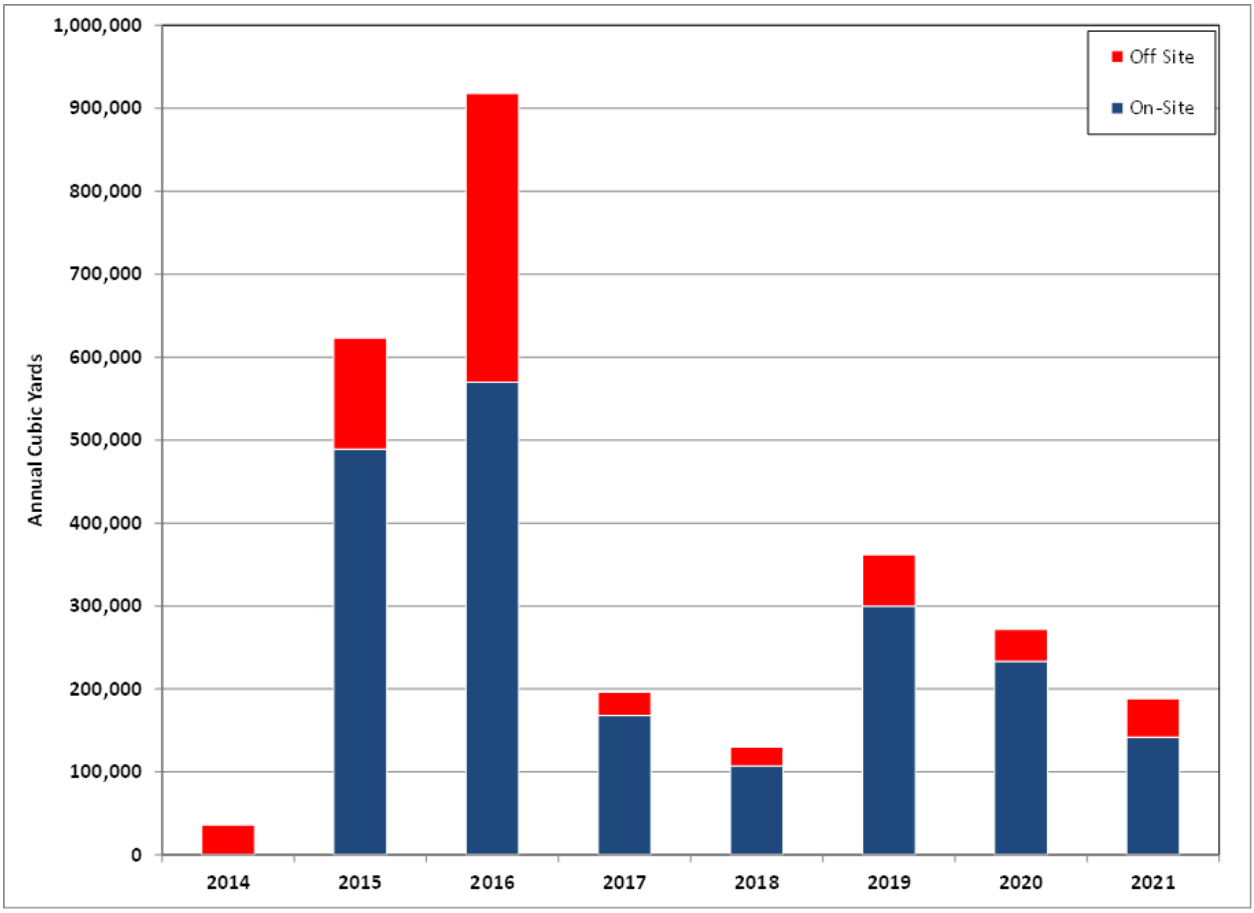

Figure 3-5 Material Estimate

3.5 Water

The EIS analyzed a total of 553 ac-ft of water consumption for construction of the CCSM Project, with a peak annual use of 168 ac-ft as shown in Table 3-7. The current construction water consumption estimate for the CCSM Project is a total of 604 ac-ft with a peak annual use of 106 ac-ft as shown in Figure 3-6. While the current estimate adds the water requirements of the Road Rock Quarry (55 ac-ft over the life of the quarry), the peak annual consumption has been reduced 60 ac-ft from the EIS peak. Potable water demand for construction of the CCSM Project is anticipated to be minimal. The water required to meet potable demands will likely come from municipal sources

The water consumption for operations, maintenance and decommissioning of the CCSM Project is anticipated to be minimal; less that 50 ac-ft per year during operations and maintenance and less than 100 ac-ft per year during decommissioning. Consistent with the analysis in the EIS, PCW will make use of existing water resources by using existing water rights as well as taking advantage of municipal supplies when available such that water use will not impact current water users or interstate agreements (BLM 2012a).

The CCSM Project water use estimates assume that only water will be used for dust control. PCW is requesting that BLM approve the use of magnesium chloride as an alternative dust control measure to improve the longevity of dust control which will reduce water use for dust suppression.[2] If the use of magnesium chloride is approved, water requirements may be reduced by as much as 30 percent.

Table 3-7. CCSM Project Construction Water Use Estimate

Year	*EIS Analysis*	Current CCSM Project Estimate
2014	*38*	14.6
2015	*109*	82.0
2016	*151*	105.4
2017	*168*	78.6
2018	*87*	58.0
2019	*N/A*	94.2
2020	*N/A*	93.0
2021	*N/A*	78.2
PEAK	***553***	**604**

[2] In accordance with current BLM policy, PCW will not apply chloride compounds or lignin derivatives within 500 feet of a perennial stream on federal lands.

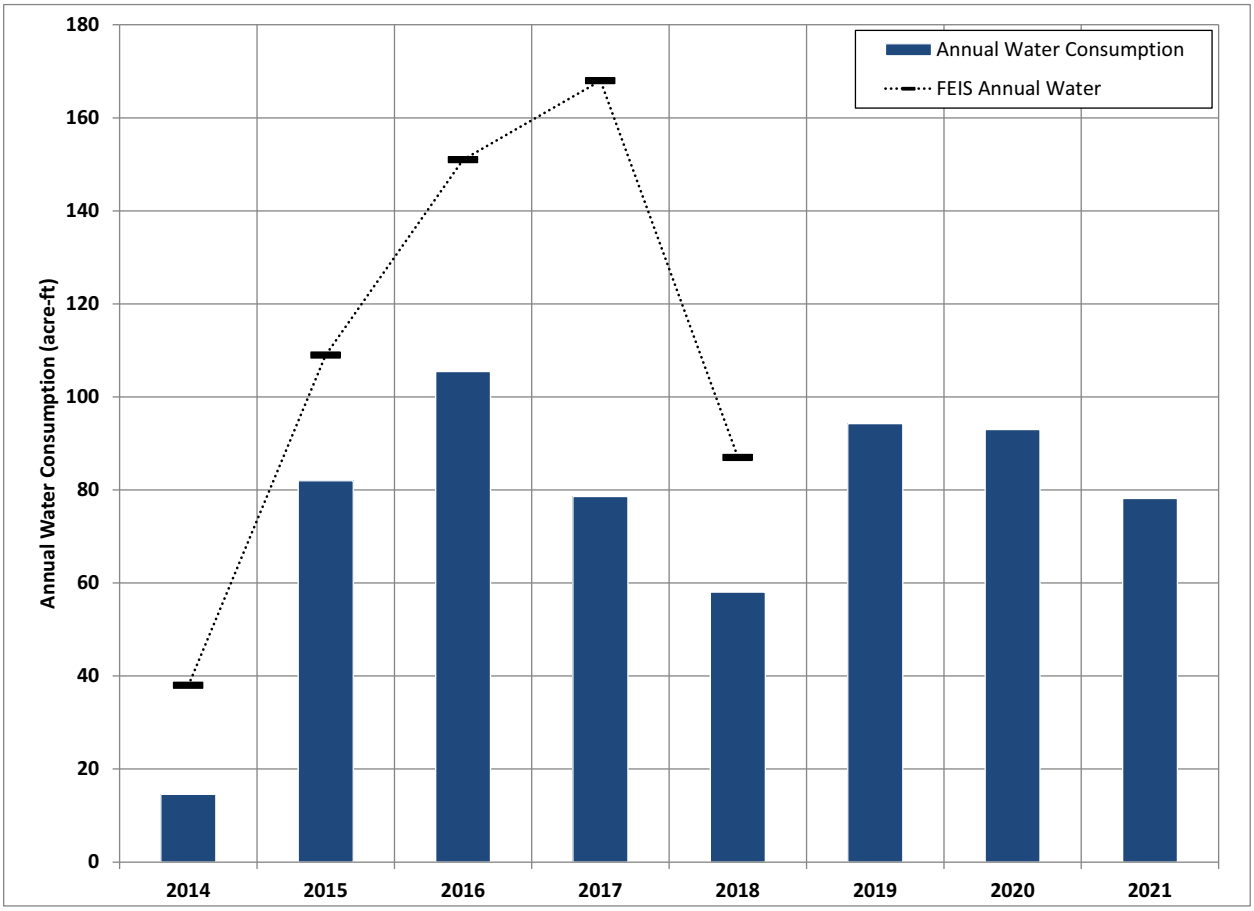

Figure 3-6. Water Use Estimate During Construction

3.6 Surface Disturbance

The initial surface disturbance for the CCSM Project analyzed in the EIS was 7,733 ac, with a long-term disturbance of 1,545 ac (BLM 2012a). The Table 3-8 and Figure 3-7 show the estimated initial and long-term disturbance for the CCSM Project by site-specific plan of development and cumulatively for comparison to the EIS. While these estimates may be refined in future site-specific plans of development, the disturbance estimates presented below represent the best available information.

Table 3-8. Disturbance Estimate

Site-specific Plan of Development	Initial Disturbance (ac)	Long-Term Disturbance (ac)
Phase I Haul Road & Facilities	875	225
West Sinclair Rail Facility	370	121
Road Rock Quarry	184	18
Phase I Wind Development	2,946	480
Phase II Wind Development	2,835	479
CURRENT DISTURBANCE ESTIMATE	**7,210**	**1,323**
EIS DISTURBANCE ESTIMATE	**7,733**	**1,545**
CHANGE	***-523***	***-222***

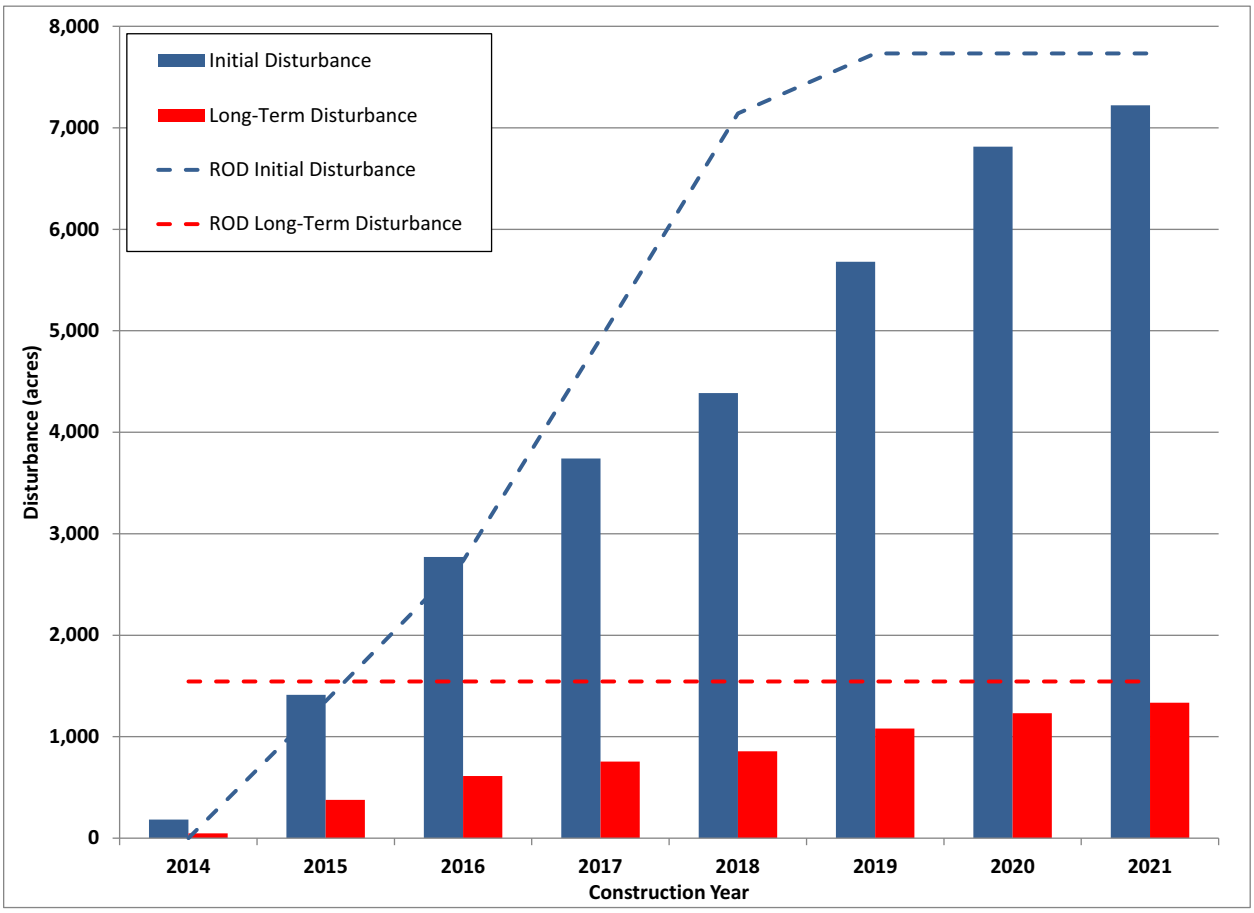

Figure 3-7. Surface Disturbance

4. Rail Facility Design

This site-specific plan of development addresses the Rail Facility, including the associated laydown yards and access road. This section provides an overview of the Rail Facility design and describes how this design meets PCW's objectives in an efficient and effective manner.

4.1 Rail Facility Design Overview

Transportation logistics is one of the key components of the CCSM Project. The CCSM Project may install up to three different types of turbines (vendor and/or model) in any given construction year and each vendor will ship components from multiple locations. The varied vendors, components and shipping origins, along with schedule constraints due to vendor capabilities and weather, require a well-planned and flexible facility. The Rail Facility is a multi-modal facility, meaning it can receive and store components and material delivered by both rail and truck. Components and material will be scheduled, received, and stored at the Rail Facility and then reloaded onto trucks for delivery to various locations across the CCSM Project.

The Rail Facility is accessed off the UPRR main line between mile-posts 678 and 680. Vehicle access to the Rail Facility is from Exit 221 off Interstate 80 via the CCSM Project Haul Road. The Rail Facility features a wye connection to the UPRR main line, a running track, a lead track, a loop track, several unloading locations, and laydown yards. Components and material brought to the Rail Facility by rail or truck will be handled in the laydown yards.

The preferred method of delivery of wind turbine components is by unit train; unit trains are trains where all railcars have the same origin and destination and move together. For wind turbine components, unit trains consist of a block of railcars up to 6,500 feet (ft) in length, often containing a single type of component (e.g. towers, turbines, or blades). The Rail Facility has sufficient track to receive, hold, and unload up to three (3) unit trains at one time to meet the CCSM Project schedule.

While turbine components are anticipated to arrive on unit trains, other materials and components may arrive via manifest trains; individual railcars or groups of railcars less than a full train that are dropped off at an interchange siding. Manifest deliveries will likely consist of items like rebar, transformers, poles, cable reels, and other materials. For each manifest train, Union Pacific will determine if they will bring the entire train into the Rail Facility and drop off the railcars for the CCSM Project or if they will remove CCSM Project railcars in Union Pacific's Rawlins Rail Yard and shuttle them to the Rail Facility.

Consistent with the analysis contained in the EIS, materials and components will also be delivered to the Rail Facility by truck. These materials and components cannot be moved by rail primarily due to clearance or other logistical issues. Trucks will deliver components and material either to the Rail Facility or directly to locations within the CCSM Project Site, depending upon schedule and storage considerations.

In the Plan of Development for the CCSM Project, PCW analyzed the potential for using the Rail Facility to receive deliveries of construction aggregate (PCW 2012). When designing the Rail Facility, these deliveries became a dominant factor due to the large volume of train cars required over a short period of time. To reduce the amount of rail traffic associated with construction aggregate, PCW determined that an onsite quarry would be a better solution to obtain road base aggregate. PCW has removed the requirements for aggregate delivery from the Rail Facility, and subsequently reduced the long-term disturbance associated with the Rail Facility from 250 acres to 121 acres. The removal of aggregate delivery from the Rail Facility design also eliminates the need for over 11,000 train cars of aggregate to be delivered to the Rail Facility. The onsite quarry is not included in this site-specific plan of development and is the subject of a separate ROW application.

4.2 Rail Facility Design Requirements

The Rail Facility is designed to meet the requirements of the CCSM Project, along with the requirements of Union Pacific, BLM, and owners of affected overhead and underground utilities. The Rail Facility is located on a combination of private, state, and federal lands. The portions of the Rail Facility located on federal lands will be constructed in accordance with the requirements of the BLM, as described in the ROD.[3] The Rail Facility design requirements, with the exception of those contained in the ROD, are summarized in the following subsections.

4.2.1 CCSM Project

The components and material that must be delivered to the Rail Facility to support the CCSM Project, along with the schedule of those deliveries, is the basis for the design of the Rail Facility. Material such as rebar, structural steel, medium voltage cable, transformers, and other electrical equipment will be delivered to the Rail Facility along with wind turbine components. Some of the material and components have complex delivery requirements that must be accounted for in the design of the Rail Facility, most notably the wind turbines and main substation transformers. Most material and component delivery will occur on two (2) manifest unloading tracks. The remainder of the Rail Facility is designed around the delivery of wind turbine components which is the most complex logistical element.

PCW has not yet selected the final turbine vendors and models for the CCSM Project; therefore, PCW reviewed a number of candidate wind turbine models to verify that their components could be delivered by rail. While some of the components analyzed did not meet UPRR system restrictions, the vendors are actively engaged with UPRR to address this issue. It is anticipated that the majority of the turbines and components under consideration for the CCSM Project will

[3] Note that PCW has agreed to apply selected measures from Table 1 of Appendix A to the Rail Facility regardless of land ownership, as noted in Appendix A.

be able to ship by rail. Table 4-1 below provides the general dimensions and weights of representative wind turbines that were used to design the Rail Facility.

Table 4-1. Wind Turbine Component Characteristics

Component	Source[1]	Length	Width	Height	Weight (tons)
GE Wind (2.85 MW, 103 meter rotor)					
Nacelle	Pensacola, FL	37' 0"	13' 8"	12' 6"	92.6
Blade	Newton, IA	159' 10"	11' 11"	11' 11"	10.6
Tower Base	Abilene, TX	39' 5"	14' 2"	14' 2"	50.7
Vestas (3.3 MW, 112 meter rotor)					
Nacelle	Brighton, CO	42' 3"	13' 6"	11' 3"	79.4
Blade	Brighton, CO	180' 6"	13' 3"	9' 3"	12.5
Tower Base	Pueblo, CO	51' 6"	14' 0"	12' 11"	80.8
Notes: (1) Indicates likely origin, subject to change by vendor.					

Wind turbine components will come in on unit trains that are up to 6,500 ft long. The Rail Facility must be able to accept and unload these unit trains without blocking access for other trains. Per typical contract requirements, wind turbine component unit trains must be unloaded within five (5) days so that specialized component cars and fixtures can be returned to the vendor for reuse in a timely manner. In addition, due to vendor capabilities, PCW expects to receive wind turbine components over a four (4) month period. Vendors have indicated that they cannot support faster delivery rates and a compressed delivery schedule would also require PCW to add substantial equipment to the Rail Facility design. The most practical and cost effective approach is to take delivery of the components over four (4) months or longer. The above requirements were used to determine the wind turbine component rate of delivery which drives the amount of track and the unloading capabilities of the Rail Facility.

This component rate of delivery derived from the requirements above dictates that the Rail Facility have sufficient track to allow for three (3) unit trains to be onsite without storing trains on the lead track. An empty unit train must be ready to leave the Rail Facility while another unit train is being unloaded, so that Union Pacific can deliver a third unit train and remove the empty train while unloading operations proceed without interruption. The component rate of delivery also requires that two (2) component unloading points be operated simultaneously.

Once the component delivery schedule was established, it was compared to the CCSM Project construction schedule. PCW must store the turbine components at the laydown yards prior to delivery to the turbine installation sites. Given that the turbine installation period is only anticipated to be 12 to 14 weeks long, a sizable laydown yards is required. It was determined that the laydown yards for the Rail Facility must have sufficient room to store up to 150 turbines. In addition, due to the differing requirements of each turbine vendor, the turbines

must be segregated by vendor. Given these requirements, the laydown yards are anticipated to be up to 181 ac.

4.2.2 Union Pacific

The Rail Facility is connected to the UPRR "Overland Route" corridor. With over 100 trains passing through per day, Union Pacific has designated this corridor as a "Restricted Access Corridor" under their Network Corridor Line Categorization system. Based on that designation, the following requirements apply to the Rail Facility's connection to the UPRR main line:

UP #1: Trains coming into the Rail Facility must clear the main line at 30 miles per hour (mph) without slowing or stopping.

UP #2: Due to the Restricted Access Corridor designation, all trains must be controlled by Union Pacific's central dispatch center. To accomplish this, Union Pacific requires that the Rail Facility connect at control points, with a strong preference for the utilization of existing control points over establishing new ones. At the location of the Rail Facility, this led to an 11,000-ft running track between the two (2) existing control points.

UP #3: Trains must be moved completely off a signalized siding (the running track) before unloading operations can commence. Union Pacific's preference is that unloading operations occur well away from the main line.

In addition, the Rail Facility is classified by Union Pacific as an industrial track facility; as such, the following conditions apply within the Rail Facility itself:

UP #4: An industrial track facility must have room to allow Union Pacific to drop off a loaded train and then connect to and remove an unloaded train (referred to as a "drop and pull" operation).

UP #5: Locomotives will need to be "run around" trains so that they remain at the head of both arriving and departing trains.

UP #6: The maximum allowable grade of a lead track into a facility is two (2) percent and any grade beyond one (1) percent requires additional equipment to prevent runaway trains. The maximum grade within an industrial track facility is 0.4 percent.

UP #7: Right of way fencing removed for construction will need be replaced by Union Pacific-specified fencing. Industrial rail lines leaving the Union Pacific right of way will require the installation of a cattle guard at minimum.

Any industrial facility connecting to the UPRR system must proceed through Union Pacific's design review process. PCW has received approval from Union Pacific on the Rail Facility's design at the 10, 30, and 70 percent design levels. Union Pacific will design the signaling for interconnection of the Rail Facility to the UPRR main line, which consist mostly of small equipment modifications within the UPRR ROW.

At the completion of the signal design process, PCW will receive the final design approval of the Rail Facility from Union Pacific. Based on approvals received to date, PCW does not anticipate any significant changes to the Rail Facility from Union Pacific approval process. PCW will receive all required approvals from Union Pacific prior to construction.

4.2.3 Utilities

The Rail Facility crosses a number of existing overhead and underground utilities as shown in Figure 4-1 and listed in Table 4-2. PCW is in the process of obtaining permission to cross each affected utility. The crossing requirements are not expected to significantly impact the Rail Facility design, specifically the alignment and limits of disturbance; however, the construction techniques used at each utility crossing may be modified to address concerns as needed.

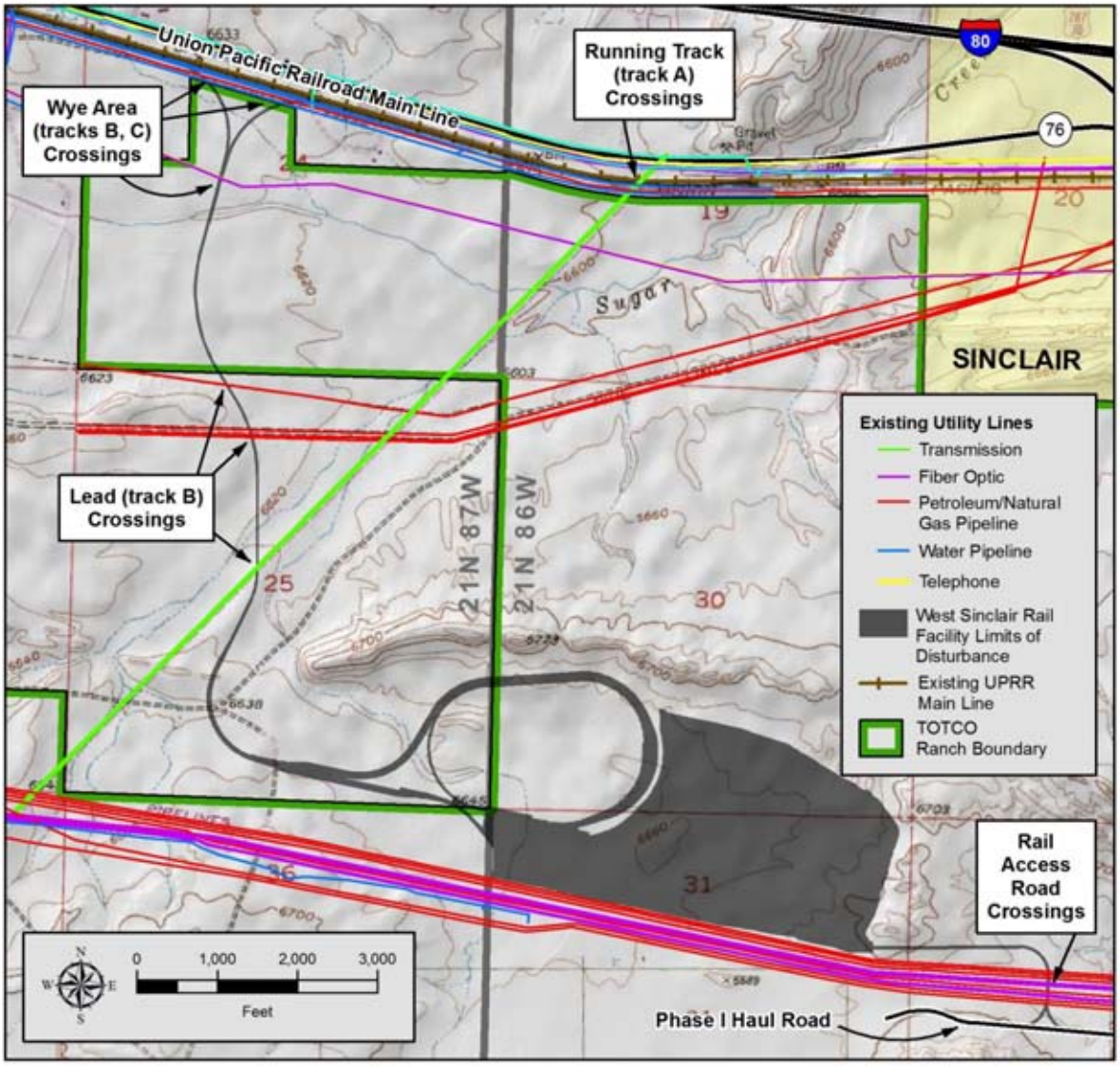

Figure 4-1 Utility Crossings

Table 4-2. Utilities

Utility Type	Utility Owner
Running (Track A)	
Electrical Transmission (overhead)	Rocky Mountain Power (PacifiCorp)
Wye (Tracks B, C)	
Petroleum	NuStar Logistics L.P.
Water	City of Rawlins
Telephone	AT&T
Fiber Optic	AT&T
Lead (Tracks B)	
Natural Gas	Source Gas
Petroleum	Plains Pipeline, L.P.
Petroleum	Pioneer Pipeline Company
Petroleum	Pioneer Pipeline Company
Electrical Transmission (overhead)	Rocky Mountain Power (PacifiCorp)
Rail Access Road	
Liquid Natural Gas	Mountain Gas Resources, Inc.
Natural Gas	Colorado Interstate Gas/Kinder Morgan
Natural Gas	Colorado Interstate Gas/Kinder Morgan
Fiber Optic	WilTel
Natural Gas	Southern Star
Fiber Optic	WilTel
Natural Gas	Wyoming Interstate Gas/Kinder Morgan
Fiber Optic	CenturyLink
Fiber Optic	AT&T
Natural Gas	Rockies Express, LLC (Tallgrass Energy Partners)
Liquefied Petroleum Gas	Williams Partners/ Oneok NGL Pipeline, L.P.

4.3 Field Investigation

PCW completed field investigations to assist in design of the Rail Facility. Field investigations included detailed survey, as well as geotechnical evaluations of the Rail Facility Site. In July and August of 2010, PCW conducted an aerial survey which included the acquisition of orthophotography and light detection and ranging (LiDAR) elevation data. The resulting terrain dataset, sufficient resolution for one-ft contours, is the basis of the Rail Facility design. In addition, PCW completed a geotechnical investigation in 2013 of the portions of the Rail Facility located on private and state lands. While similar geotechnical conditions are anticipated on federal lands, PCW plans to conduct additional geotechnical investigations to verify the assumed subsurface conditions.

The 2013 geotechnical investigation included field and laboratory testing, followed by engineering analysis. Field testing consisted of drilling and sampling 38 borings to depths varying from 10 to 40 ft below existing grade. Field testing also included the installation of three (3) groundwater piezometers that will continue to be monitored. Laboratory analysis of the field data consisted of performing index, strength, and volume change tests on samples recovered from the geotechnical borings. The results of the laboratory analysis were used to classify the subsurface materials and determine their relevant engineering properties. The engineering analysis included reviewing and interpreting the data collected from the field and laboratory testing to provide design and construction recommendations, including bearing capacity, settlement/heave estimates, excavation potential, and groundwater control that were incorporated into the design of the Rail Facility.

4.4 Rail Facility Components

The Rail Facility as shown in Figure 4-2 has been designed to meet the requirements described in section 4.2. The Rail Facility consists of several different components as summarized in Table 4-3 below. The disturbance associated with the Rail Facility components is detailed further in Table 8-1 of section 8.1. The design drawings for the Rail Facility are included as Appendix B to this site-specific plan of development. Each component is described in detail in the sections below.

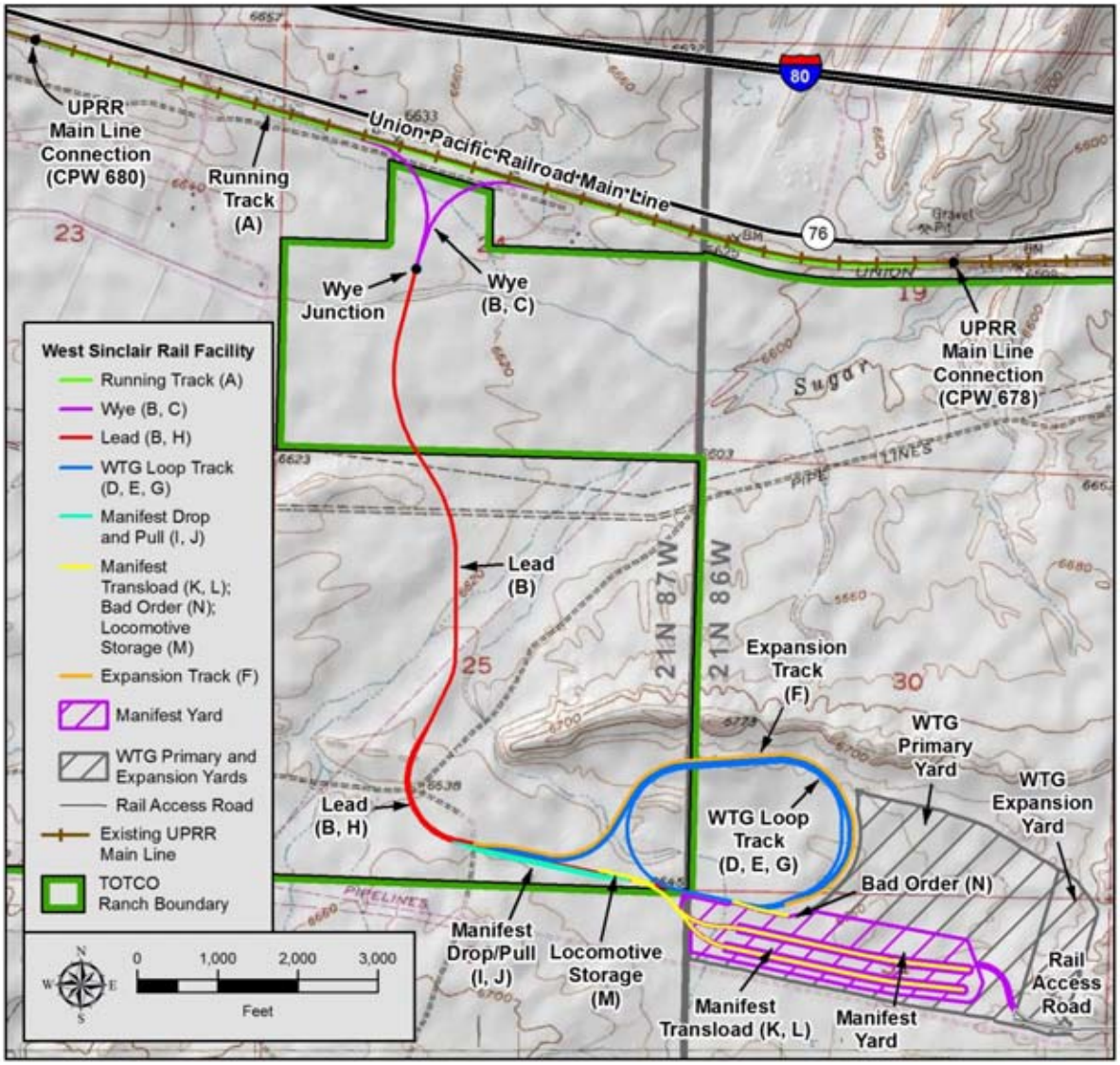

Figure 4-2 Rail Facility Layout

Table 4-3. Rail Facility Track Segments

Track ID	Name of Track	Length (ft)	Resp.	Primary Purpose
A	Running	11,810	Union Pacific	Merging onto and off of main line
B, C	Wye Junction	4,610	Union Pacific	Receiving and departing of trains
B, H	Lead	12,680	PCW	Delivery of railcars into the rail loop
D, E, G	Loop	22,100	PCW	3 sets of tracks – one for unloading, two for staging of unit trains
I, J	Manifest Drop and Pull	4,250	PCW	Delivery and staging of manifest cars
K, L	Manifest Transload	8,350	PCW	Unloading of nacelles, bulky items, and other manifest cars
N	Bad Order	700	PCW	Railcar maintenance & repairs
M	Locomotive Storage	700	PCW	Parking of UPRR road locomotives
F	Expansion	6,950	PCW	An additional loop track that can be constructed if additional track is deemed necessary during rail operations.
	TOTAL TRACK LENGTH	**72,150**		

4.4.1 Rail Access Road

The Rail Facility's 0.9 mile-long access road connects the Rail Facility to the CCSM Project's internal road network to facilitate delivery of components and materials to and from the Rail Facility. The access road is routed from the southeast corner of the laydown yards to the CCSM Project's Haul Road (Figure 4-3). The Rail Facility's access road is classified as a haul road, which includes a 40-ft-wide driving surface and a design speed of up to 40 mph. However, due to the curves required to effectively cross the utility corridor and meet drainage requirements, the design speed for the Rail Access Road will be reduced to 20 mph at the crossing point. The design elements of the CCSM Project roads, including the haul road classification, are described in Appendix C.

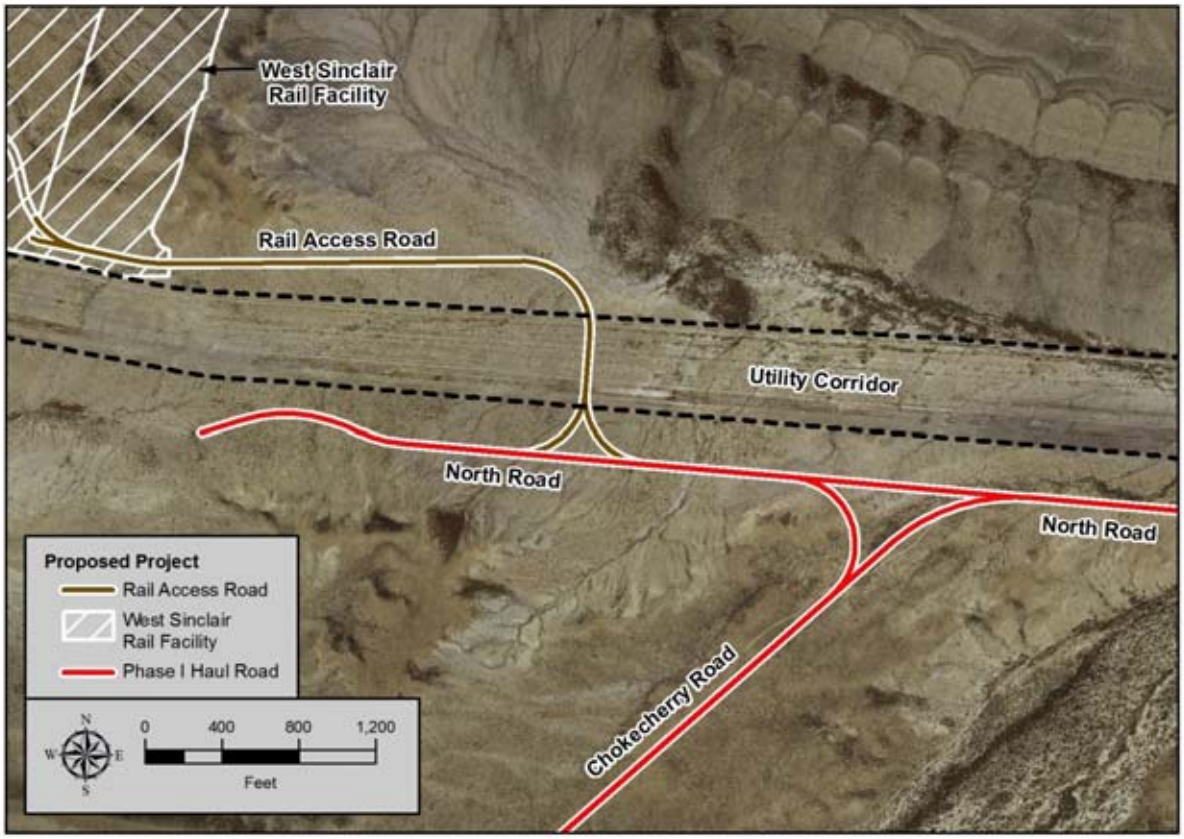

Figure 4-3 Rail Access Road

4.4.1.1 Structural Design

The structural design of the Rail Access Road takes into account local geologic and soil conditions, as well as expected use. The access road design accounts for the heavy and frequent loads the road will encounter throughout the CCSM Project's construction (Appendix B), and considers the site-specific conditions found during geotechnical testing (Fugro 2013). The site-specific soil properties were analyzed to determine the bearing capacity of the soil and identify subgrade stabilization measures. Stabilization measures are described in the road design manual (Appendix C). The aggregate base thickness for the Rail Access Road will vary between 8 and 24 inches based upon soil conditions. PCW expects that the construction team may encounter variations in soil characteristics that will require field adjustments. If determined necessary, additional subgrade stabilization measures that may be employed including additional aggregate base, geotextile fabrics, or geo grid.

4.4.1.2 Hydrology

The alignment of the Rail Access Road requires crossing natural drainages. The alignment of the access road was chosen to minimize the number of crossings to the extent practicable. Where crossings were necessary, crossing locations were chosen to minimize the disturbance

required and to eliminate drainage crossings at locations where there are underground utilities, such as pipelines or telecommunications lines.

Due to the heavy volume of traffic and the need for the access road to remain open during all-weather events, traditional crossings with culverts were selected. The crossings have been designed to accommodate a minimum 25-year storm event. Typical crossing designs are shown in Appendix B. In addition, ditches will be placed adjacent to the Rail Access Road to collect water and convey it away from the road toward existing natural drainages. The ditches have also been designed to accommodate a minimum 25-year storm event.

4.4.2 Rail Facility Laydown Yards and Facilities

The laydown yards for the Rail Facility (Figure 4-4) are designed to store wind turbine components, as well as to stockpile aggregate and other construction material. The primary laydown yard is designed to accommodate up to 150 complete wind turbines in a dense storage pattern or up to 100 turbines in an optimized environment. PCW has also identified a secondary expansion laydown yard (Figure 4-4) that will be used if the primary laydown yard reaches capacity. The laydown yards are designed to accept material and components by both rail and truck. Vehicle access to the laydown yards is off the CCSM Project Haul Road via the Rail Access Road.

An administrative office trailer for the Rail Facility will be located within the laydown yards. The office trailer will include office and meeting spaces, as well as a break room. Adjacent to the trailer will be employee parking, portable toilets, and equipment storage containers. The trailer is portable to accommodate changes in configuration of the laydown yards. Electrical power for the trailer will be provided by generator during CCSM Project construction; however, long-term the trailer will likely be connected to the CCSM Project distribution lines.

The laydown yards are designed to maximize the usable area for component and material storage. Grid areas were designated to allow segregation of wind turbine components by type and vendor. The Rail Facility operator will determine the final arrangement of materials and component within the laydown yards to maximize the efficiency of unloading, storage, and distribution. Based on the alignment of the Rail Facility, the laydown yards will parallel the track along the east edge of the rail loop (Figure 4-4). This configuration allows for multiple unloading operations.

After components and material are unloaded from trucks or trains into the laydown yards, they will be organized and stored until they are needed for the CCSM Project. Some items will be stored uncovered, while others may be stored in cargo containers or crates. Special handling and storage devices will be used as required, and when available, e.g. specially-configured brackets used to double-stack blades.

PCW will install lights at the laydown yards for security and safety purposes. The lights will only be used when there are components or materials stored in the area. The lighting will consist of portable light plants with telescoping booms set high enough to limit shadows, but low enough for effective lighting (typically 20 ft above ground level). Lights will have downward shields and motion detection will be used where such control is compatible with safety. Portions of the laydown yards containing higher value items will also be fenced using temporary fencing.

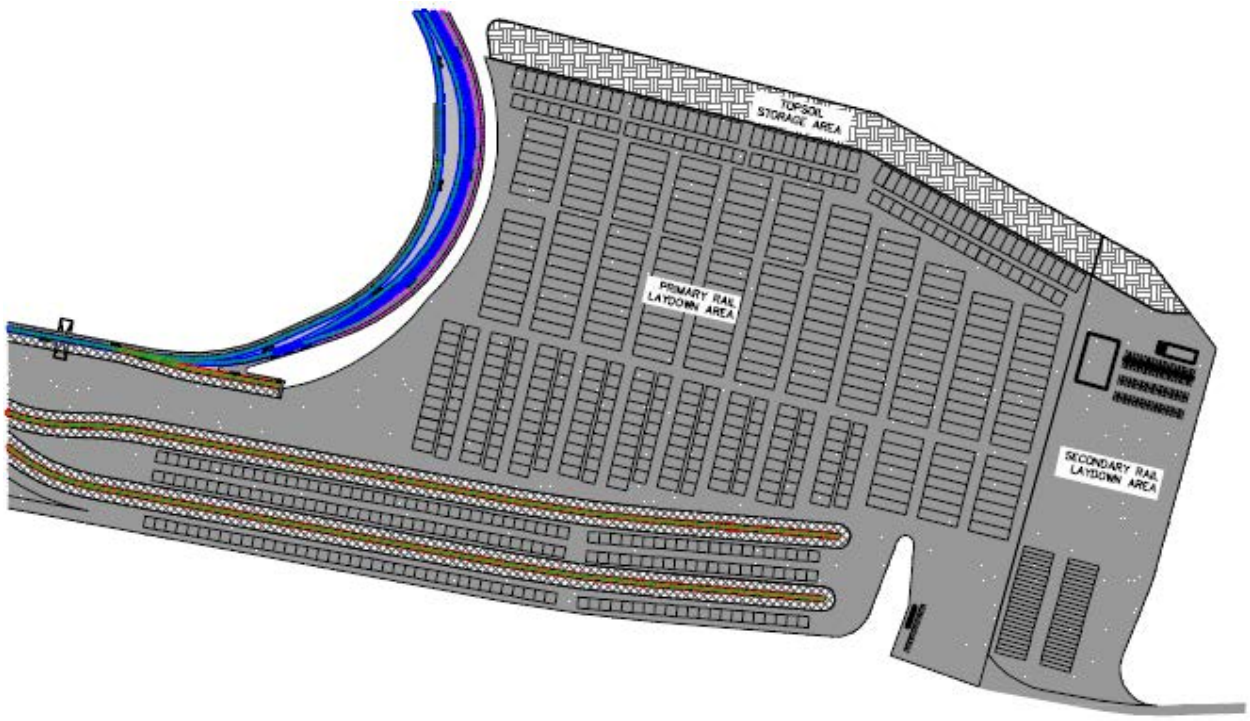

Figure 4-4 Rail Facility Laydown Yards

4.4.2.1 Structural Design

The structural design of the laydown yards accounts for the heavy loads the laydown yards will encounter throughout the CCSM Project's construction (Appendix B) and is based on the site-specific soil properties found in the geotechnical investigation (Fugro 2013). The site-specific soil properties were analyzed to determine the bearing capacity of the soil and identify subgrade stabilization measures. Potential stabilization measures are similar to those described for road construction in the CCSM Project Road Design Manual (Appendix C). The aggregate base thickness for the Rail Access Road will vary between 8 and 24 inches based upon soil conditions and expected loading requirements. PCW expects that the construction team may encounter variations in soil characteristics that will require field adjustments. If determined necessary, additional subgrade stabilization measures that may be employed including additional aggregate base, geotextile fabrics, or geo grid. Crushed asphalt, if locally available,

may be placed two (2) to three (3) inches thick on the surface of the laydown yards to provide a finished surface. The depth of this surfacing will be based on the size of the available material.

4.4.2.2 Hydrology

The laydown yards are located in a dry, upland area and have been designed to have beneficial drainage to ensure all weather access. To minimize the amount of water draining to the laydown yards, a series of diversion ditches have been designed to collect water and direct it around the Rail Facility. Water that does collect on the surface of the laydown yards will be directed toward features such as swales, ditches, terraces, sediment basins, and culverts/storm sewers. The final arrangement of storm water features within the laydown yard will be determined by PCW once the Rail Facility operator has determined the final arrangement of materials and component within the laydown yards. Where required, water that leaves the surface of the laydown yards will be directed toward sediment basins to treat the storm runoff and control the rate and velocity at which it leaves the site. The sediment basins will be designed to meet the requirements of the Wyoming Department of Environmental Quality. Calculations for sizing the sediment basins will be inserted into the Storm Water Pollution Prevention Plan (SWPP Plan) for the Rail Facility (Appendix I) prior to construction.

4.4.3 Union Pacific Main Line Connection and Running Track

Trains will enter and leave the Rail Facility using two (2) connection points to the UPRR main line, one east of the Rail Facility near mile marker 678, and one west near mile marker 680. The Rail Facility running track (Track A) will be built parallel and south of the UPRR main line between the two (2) connection points. The running track will allow incoming trains to exit the UPRR main line at 30 mph and decelerate to 20 mph or less before coming into the Rail Facility wye junction, and will also allow leaving trains to accelerate to 30 mph before entering the UPRR main line, in accordance with design requirement UP#1. The length of the main line and the location of the switches are set by the two (2) existing control points on the UPRR main line (CPW 678 to the east and CPW 680 to the west).

Union Pacific has an existing universal crossover at mile marker 680 that allows trains to cross between the eastbound and westbound tracks of the main line, and once the Rail Facility's running track (Track A) is built, Union Pacific will install a new Number 15 Right-Hand Pull-Out switch just east of the crossover for trains to cross onto the running track. Union Pacific intends to add a new crossover at mile marker 678 into their system, and once the Rail Facility's running track is built, will install at Number 15 Left-Hand Pull-Out switch. These two (2) switches connect the Rail Facility to the UPRR main line.

4.4.4 Wye Junction and Lead Track

The Rail Facility design includes a wye junction and a lead track that connect to the running track; this allows PCW to locate the unloading and laydown components of the Rail Facility further from the UPRR main line in accordance with design requirement UP#3. This also allows

the Rail Facility laydown yards to be closer to the CCSM Project Haul Road and further from area residents. The wye junction is designed to allow trains to approach the Rail Facility from the east (northern extent of Track B) and west (Track C), and turn onto the lead track. The lead track begins at the wye junction as a single track (southern extent of Track B), and then splits to a double track (Tracks B and H) as it approaches the remainder of the Rail Facility. While the wye junction is level, the lead track has a maximum slope of one (1) percent, which meets design requirement UP#6 and avoids the need for additional runaway train switches and sidings.

4.4.5 Wind Turbine Unloading Tracks

The tracks associated with unloading wind turbine components are those that give the Rail Facility its characteristic loop design. Two (2) tracks (Tracks D and E) connect to the northern lead track (Track B) and form the outer tracks of the loop. The inner loop track (Track G) is also used for wind turbine component trains. The Rail Facility design includes a potential expansion track (Track F) on the outside of the loop that can be built quickly and within the footprint of the Rail Facility if it is necessary to meet the Rail Facility objectives and design requirements. Tracks D, E, G, and F (if built) merge together in the southern extent of the loop where the merged track is used for wind turbine component unloading. In this arrangement, gantry or tracked cranes can unload two (2) to three (3) cars from a unit train while the train is continually advanced to limit the amount of crane repositioning required.

The wind turbine unloading loop tracks meet the CCSM Project design requirements by accommodating up to three (3) 6,500 ft in length unit trains at any one time. The loop track design also optimizes rail operations and safety as it minimizes backing, cutting of unit trains, and switching activities. These activities can be difficult for some wind turbine component unit trains that include either idler cars (for blades) or power generation cars (for nacelles). The loop design also allows the Rail Facility to meet design requirement UP#5, that locomotives are able to “run around” trains, so they can remain at the head of arriving and departing trains. In accordance with design requirement UP #6, the maximum grade within the loop track and the rest of the industrial track facility is 0.39 percent.

4.4.6 Manifest Unloading Tracks

South of the loop tracks are two (2) parallel tracks (Tracks K and L) to be used for additional train unloading. These sidings are approximately 2,900 ft in length and are intended for the unloading of either non-unit train cars (manifest), or for unit trains that can be broken into two (2) strings. To facilitate breaking-up trains to use Tracks K and L, the Rail Facility includes two (2) “drop and pull” tracks (Tracks I and J). The drop and pull tracks, each about 1,400 ft long, can also hold outbound empty cars waiting for Union Pacific locomotives to remove them.

Tracked and wheeled cranes and forklifts will unload components and materials from both sides of tracks K and L over their entire length. The space between these tracks is

approximately 260 ft, which is sufficiently wide to allow for trucks with up to 19 axles to turn around.

4.4.7 Bad Order and Locomotive Storage Tracks

Two (2) other track elements are included in the design of the Rail Facility, the bad order track (Track N) and the locomotive storage track (Track M). Union Pacific requires that all railcars are inspected prior to being put back onto the main line. Any cars not passing inspection must be separated onto a "bad order" track and held for repair. The Rail Facility's 700-ft Track N is designated to serve as a bad order track and hold railcars for repair.

Union Pacific main line locomotives will only be onsite briefly to deliver incoming trains and remove outgoing trains. The movement of trains within the Rail Facility will require that one (1) or more locomotives be stationed at the Rail Facility during construction of the CCSM Project. The Rail Facility design includes a 700-ft track (Track M) for onsite storage of locomotives when not in use.

5. Construction

Access to the Rail Facility is expected to be constructed in 2014, and construction of the Rail Facility itself is anticipated to occur in 2015 and 2016, after which the Rail Facility will be operated to support the CCSM Project. Construction of the Rail Facility requires coordination between the PCW construction team and the construction team working for Union Pacific. The majority of the Rail Facility construction occurs outside of the UPRR ROW and will be completed by the PCW construction team; however, a second team working directly for Union Pacific will perform all work within the UPRR ROW and construction of the wye.

Construction of the Rail Facility will occur in two (2) stages: site preparation and track construction. Prior to the commencement of construction, PCW will review the limits of disturbance with the construction contractors and stake the Rail Facility Site as needed. Site preparation will then begin with topsoil removal, then excavation, grading, and compaction. Following grading, the sub-ballast aggregate material will be placed to support the track bed. Blasting is not anticipated to be necessary for construction of the Rail Facility.

Once the site preparation is complete, the track materials (rail, cross ties, and fasteners) will be assembled to form the tracks and turnouts. The Union Pacific construction team will also install the switches and crossings necessary to connect the Rail Facility to the main line. Upon completion, all track components will be inspected and tested by Union Pacific to verify that they meet all design requirements and are properly installed. Virtually all equipment necessary to operate the Rail Facility, i.e. unloading and material handling, is mobile; therefore, no significant equipment will be erected as part of the Rail Facility construction.

5.1 Schedule

PCW anticipates building the Rail Facility in 2015 and 2016, with the access road to the Rail Facility site constructed in 2014. The flow of construction for the Rail Facility is summarized in Table 5-1

Table 5-1. Construction Summary Schedule

Activity	Period
2014	
Construction Mobilize	Aug
Road Construction – Rail Access Road	Sept – Oct
Construction Demobilize	Nov
2015	
Construction Mobilize	May
Site Preparation – Site/Laydown Yard Grading	Jun – Nov
Site Preparation –Track Initial Grading (pre-settlement)	Jul – Oct
Construction Demobilize	Nov
2016	
Commence Signal Work in UPRR Right of Way (by Union Pacific)	Jan
Construction Mobilize	Apr
Site Preparation –Track Final Grading	Apr
Track Construction – Running Track (by Union Pacific)	Apr – Nov
Track Construction – Remaining Tack (by PCW)	May – Nov
Laydown Yard Completion	Jun – Oct
Complete Signal Work (by Union Pacific)	Nov
Rail Facility Commercial Operation Date	Nov
Construction Demobilize	Nov

The construction schedule for the Rail Facility has been developed to meet the needs of the CCSM Project, as well as to comply with the measures included in the ROD, as outlined in Appendix A.

5.2 Workforce

Table 5-2 provides an estimate of the maximum workforce by month necessary to construct the Rail Facility. The peak workforce for the construction of the Rail Facility is 96 workers, anticipated to occur during August and September of 2016.

Table 5-2. Construction Workforce Estimate

Month	Union Pacific	Non-Union Pacific	TOTAL
2014			
August	0	7	**7**
September	0	16	**16**
October	0	17	**7**
November	0	6	**6**
December	0	6	**6**
2015			
January	0	6	**6**
February	0	6	**6**
March	0	6	**6**
April	0	7	**7**
May	0	10	**10**
June	0	22	**22**
July	0	87	**87**
August	0	87	**87**
September	0	87	**87**
October	0	87	**87**
November	0	17	**17**
December	0	5	**5**
2016			
January	3	8	**11**
February	3	8	**11**
March	3	8	**11**
April	6	10	**16**
May	27	32	**59**
June	27	50	**77**
July	27	54	**81**
August	37	59	**96**
September	37	59	**96**
October	27	54	**81**
November	13	26	**39**
December	3	8	**11**

5.3 Access

Vehicle access to the Rail Facility during construction will be via the CCSM Project's main entrance off of Interstate 80 at Exit 221. From the CCSM Project entrance, vehicles will use the CCSM Project's Haul Road (North Road) and the Rail Access Road to reach the Rail Facility Site

(Figure 5-1). Travel within the Rail Facility Site will be by company truck or van only. The construction workforce for the Rail Facility will leave all personal vehicles at the CCSM Project or Rail Facility parking lots.

When access to the UPRR ROW is required, personnel will use Wyoming Highway 76 to reach access points authorized by Union Pacific. Access to the UPRR ROW will be coordinated with Union Pacific in advance.

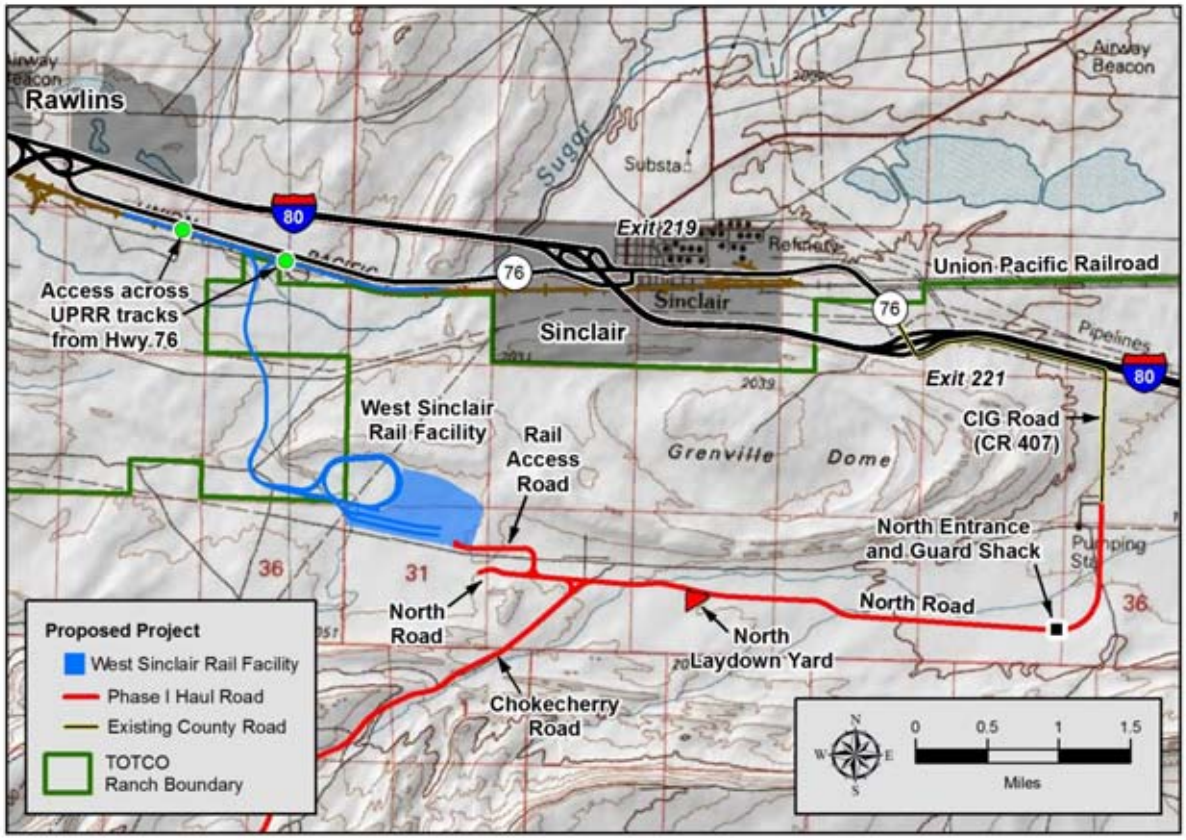

Figure 5-1 Rail Facility Site Access

5.4 Equipment

The peak amount of equipment necessary to construct the Rail Facility is listed in Table 5-3 below. Not all equipment will be used simultaneously.

Table 5-3. Construction Equipment Breakdown

Equipment	2014	2015	2015
Heavy Vehicles and Equipment			
Aggregate Hauling Trucks (Belly Dump)	0	4	4
Ballast Regulator	0	0	6
Compaction Equipment	0	10	2
Dozer	0	8	2
Excavator	0	4	0
Forklift	0	4	0
Front End Loader	0	0	12
Hi-Rail Dump Truck	0	0	8
Motor Grader	0	8	2
Portable Welding Truck	0	0	2
Scraper	0	6	2
Tamper	0	0	6
Track Hoe	0	1	4
Tractor with Disk	0	4	1
Water Truck	0	2	2
Wheel Loader	0	2	2
HEAVY VEHICLES AND EQUIPMENT TOTAL	**0**	**53**	**55**
Light Vehicles			
Pick-Up Trucks	8	40	45
TOTAL VEHICLES AND EQUIPMENT	**8**	**40**	**45**

5.5 Material and Components

The significant materials and components needed to construct the Rail Facility are estimated in Table 5-4.

Table 5-4. Construction Materials and Components Estimate

Track ID	Name of Track	Length (ft)	Rail (tons)	Ties (tons)	OTM[1] (tons)	Ballast (tons)	Turnouts / Switches
Union Pacific Construction Team							
A	Running	11,810	488	682	166	11,513	2 x No. 15 POTO[2]
B,C	Wye	4,610	84	239	58	4,491	3 x No. 15 POTO[2]
TOTAL UPRR		**16,420**	**572**	**921**	**224**	**16,004**	**5 x No. 15 POTO[2]**
PCW Construction Team							
B,H	Lead	12,680	519	726	177	12,358	1 x No. 11 HTTO[3]
D,E,G	Loop	22,100	925	1,293	315	21,476	4 x No. 11 HTTO[3]
I,J	Manifest Drop/Pull	4,250	154	215	52	4,138	4 x No. 11 HTTO[3]
K,L	Manifest Transload	8,350	351	490	120	8,138	2 x No. 11 HTTO[3]
N	Bad Order	700	25	35	9	680	1 x No. 11 HTTO[3]
M	Loco. Storage	700	25	35	9	680	1 x No. 11 HTTO[3]
TOTAL PCW		**48,780**	**1,999**	**2,794**	**682**	**47,470**	**13 x No. 11 HTTO[3]**
TOTAL FACILITY		**65,200**	**2,571**	**3,715**	**906**	**63,474**	**18 turnouts**

Notes: [1]OTM = Other Track Material
[2]POTO = Power turnout
[3]HTTO = Hand-turn turnout

5.6 Material and Component Deliveries

Certain materials required to build the portion of the Rail Facility within the UPRR ROW will arrive by rail. Specifically, continuously welded rail and ballast will be delivered by rail using dedicated trains used for UPRR maintenance-of-way (Figure 5-2). Turnouts and switches will either be "panelized" (partially assembled in a centralized factory location) or assembled onsite. Panelized turnouts are typically delivered by rail; however, if the turnouts are to be assembled onsite, the materials will be delivered by truck. Top ballast, a layer of ballast that is placed and

spread between the ties and the tracks, is commonly delivered to new tracks by rail and placed directly by the delivery railcars (Figure 5-3). The ties and OTM will be delivered by truck.

Figure 5-2 Continuously Welded Rail Delivery Train

Figure 5-3 Rail Ballast Placement

All rail, ties, turnouts, switches, and track materials required for construction outside of the UPRR ROW will be delivered by truck. Top ballast will be delivered by truck until the work

within the UPRR ROW is completed and the Rail Facility is connected to the UPRR main line. Once the Rail Facility is connected, the remaining top ballast may arrive by rail.

Sub-ballast material for the Rail Facility will be obtained from areas of cut within the Rail Facility Site if suitable. If the soil obtained onsite is insufficient or not suitable, additional sub-ballast will arrive by truck from the CCSM Project's Road Rock Quarry.

5.7 Communications

Personnel communications during construction will be maintained via hand-held radios and cellular phones per the CCSM Project Health and Safety Plan (Appendix R). If hand-held radio reception is inadequate, radio repeater stations will be installed.

5.8 Construction Activities

5.8.1 Mobilization and Demobilization

The PCW construction team will mobilize a few weeks prior to construction. The PCW construction team will bring construction trailers and management staff to the Rail Facility Site. The Union Pacific construction team will most likely work out of the existing Union Pacific yard office in Rawlins. Each construction team will have dedicated equipment and material that will be delivered to the Rail Facility Site by truck or rail. Earthmoving equipment, such as bulldozers and graders, will arrive by truck using low-boy trailers. Specialized railroad construction equipment, such as tampers that are used to align the track, hi-rail dump trucks, and ballast regulators will likely arrive by truck for the PCW construction team and by truck or rail for the Union Pacific construction team.

Both the PCW construction team and the Union Pacific construction team are expected to use local housing options for their staff. While it is possible the Union Pacific construction team may choose to bring Union Pacific camp railcars to the Rawlins Railyard, Union Pacific representatives have indicated they do not expect to do so.

As construction of each component is completed and particular pieces of equipment are no longer required, equipment will be demobilized from the Rail Facility Site. In virtually all cases, demobilization will be by the same transportation mode used for mobilization. At the conclusion of the Rail Facility's construction, construction trailers will be removed along with any remaining construction equipment.

5.8.2 Temporary Facilities

As discussed above, it is anticipated that PCW's construction team will place temporary construction trailers onsite to support construction activities. The construction trailer area will be graded and graveled. PCW anticipates up to two (2) double wide and three (3) single wide temporary construction trailers will be needed for the construction of the Rail Facility. The

construction trailer area will also include portable sanitation facilities (portable toilets), fuel storage, waste disposal containers, and a parking lot for personal vehicles.

The equipment used to establish the construction trailer area will include bulldozers, motor graders, compaction equipment, aggregate hauling trucks, and water trucks. The bulldozers and motor graders will complete the clearing and grading operations and the compaction equipment, typically vibratory rollers, will compact the subgrade prior to placement of the aggregate. The compaction rollers will also be used after the delivery and grading of the aggregate. It may also be necessary to occasionally use a water truck for dust control during and after construction.

Once the site is prepared, the trailers will arrive to the CCSM Project Site by truck. The trailers will be placed on stands and the double wide trailers will be connected. Electrical power for the construction trailers will be provided by portable generators. Portable toilets will be placed adjacent to the trailers. If portions of the temporary construction trailer area can be used in its native condition without excavation or compaction, such as temporary laydown on top of existing vegetation, PCW will request that the construction contractor use temporary matting, hay bales, or similar methods to protect the existing vegetation root structure to facilitate reclamation.

5.8.3 Site Preparation

Site preparation for the Rail Facility will begin with the installation of perimeter sediment controls and topsoil removal. Following topsoil removal the site will be excavated, graded, and compacted per the Rail Facility design documentation (Appendix B). All soil handling will be in accordance with the requirements of the Rail Facility Reclamation Plan (Appendix L). Topsoil that is striped will be segregated and stockpiled at the edge of the laydown yards and rail tracks for use during reclamation. Excavated subsoil will be stockpiled and used as fill throughout the Rail Facility and CCSM Project as suitable. Following site grading, the necessary drainage structures and features will be installed and gravel or sub-ballast aggregate material will be placed as appropriate.

Due to the compressive soils in some areas of the Rail Facility Site, PCW may elect to perform “pre-loading,” where fill material is placed several months before track construction begins. This approach allows the settlement of the soil to conclude and final grade be established within Union Pacific’s tolerance.

The equipment used to conduct site preparation includes bulldozers, scrapers, motor graders, compaction equipment, aggregate hauling trucks, and water trucks. The bulldozers, scrapers, and motor graders will complete clearing and grading operations. The compaction equipment, typically vibratory rollers, will compact the graded earth prior to placement of the sub-ballast aggregate. It will also be necessary to occasionally use a water truck to condition the graded

soils in order to meet the compaction requirements, as well as for dust control during construction.

5.8.4 Track Within UPRR ROW

Following site preparation, the Union Pacific construction team will assemble the main line turnouts on the construction pads to the side of the main line. This allows the turnouts to be constructed without disrupting the UPRR main line. Completed turnouts will be installed in the main line during a work window lasting no more than a day to minimize the time that the main line will be out of service. Once the main line turnouts are installed, the Union Pacific construction team will begin "skeletonizing" or assembling the track ties, rail, and other track materials directly on the top of the sub-ballast. Once the track has been assembled, a ballast train will be brought in to run on the skeletonized track and bottom-dump the ballast material onto the track. The track will be buried up to the top of rail with ballast material. A tamper will then raise and tamp the track in 4 to 6 inch lifts (Figure 5-5). Once the track has been lifted and tamped, additional ballast will be delivered and the process will be repeated until the track is at the design grade and elevation. The ballast will be dressed and "broomed" by a ballast regulator (Figure 5-6). Once the track has been installed, the signaling and power switch machine equipment will be installed. All closure rail joints will be welded with thermite field weld kits.

5.8.5 Track Outside UPRR ROW

All of the materials necessary to construct track outside of the UPRR ROW will be delivered by truck, thus the PCW construction team will use a slightly different approach to assemble track than the Union Pacific construction team. Once site preparation is complete, the PCW construction team will spread out a two (2) to four (4) inch layer of ballast with trucks and front-end loaders to minimize the number of lifts that will be required to properly align the track. A portable flash butt welding truck will be used to weld the rail sections (which arrive in either 39 ft or 80 ft sections) into quarter-mile lengths. The track crew will then skeletonize the track ties, rail, and other track materials on top of the two- (2) to four- (4) inch layer of ballast. Once the track has been assembled, hi-rail dump trucks will run on the skeletonized track and back-dump the ballast material onto the track, burying it to the top of rail (Figure 5-4). A tamper will then raise and tamp the track in four- (4) to six- (6) inch lifts. Once the track has been lifted and tamped, additional ballast will be delivered and the process will be repeated until the track is at the design grade and elevation with the ballast properly compacted beneath the ties. The ballast will be dressed and broomed by a ballast regulator. All rail joints will be welded with thermite field weld kits.

Figure 5-4 Hi-Rail Dump Truck

Figure 5-5 Tamper

Figure 5-6 Ballast Regulator

5.8.6 Laydown Yards

The site is prepared per the method described in section 5.8.3, and required drainage features are added to the yard to meet the requirements of the SWPP Plan (Appendix I). A gravel surface is then added to the laydown yard area to the depth described in the design set.

6. Operations and Maintenance

The Rail Facility will serve as the multi-modal transportation hub and laydown yard during the construction, operations, maintenance, and decommissioning of the CCSM Project. The Rail Facility is designed to simultaneously receive multiple trains and trucks of turbine components, construction materials, and equipment while loading trucks for delivery to turbine installation locations.

Starting in 2017, PCW expects the Rail Facility to have an operational season from March through November for each year of CCSM Project construction. Usage of the Rail Facility is expected to be highest in May through September when the majority of the wind turbine components will be received. PCW expects to operate the Rail Facility 12 hours per day, 6 days per week. The precise operation schedule for the Rail Facility will be based on the delivery schedule for materials and components, as well as the CCSM Project schedule. While not currently anticipated, delivery schedules could require deliveries and onsite storage outside of the schedule discussed above, which would affect the operation schedule of the Rail Facility.

The Rail Facility will require a seasonal workforce during CCSM Project construction to handle the unloading and transfer of components and material between the trains, laydown yards, and installation sites. The laydown yards are expected to store close to 1,500 wind turbine components while allowing traffic to circulate freely. Railcars will be unloaded in up to four (4) locations. Unloaded components will be shuttled to the laydown yards or placed directly into storage next to the rail lines. A fleet of approximately 40 oversize capacity trucks will be required to deliver components to turbine installation sites at a rate of 25 complete turbines per week over a 10 week period. The laydown yards will also likely be used to test and maintain the turbine components prior to delivery to the installation site.

6.1 Workforce

During construction of the CCSM Project's wind development areas, the Rail Facility's operations team will consist of up to 147 workers consisting of rail and crane operators, delivery truck drivers, and laborers. The workforce will be significantly reduced during off-peak times. PCW intends to have minimum security and maintenance staff at the Rail Facility during winter months if no deliveries are scheduled. During operation of the CCSM Project, the Rail Facility will be staffed as needed for large maintenance material deliveries; most of the smaller deliveries will occur by truck. PCW anticipates contracting the operation of the Rail Facility to a third-party rail operations firm who will bring staff to the Rail Facility as needed.

6.2 Access and Security

Vehicle access to the Rail Facility will be maintained at all times during active use. Access to the Rail Facility will be via the CCSM Project's north entrance off of Interstate 80, Exit 221. From the CCSM Project entrance, vehicles will use the CCSM Project's internal Haul Road and the Rail Access Road to reach the Rail Facility. Rail Facility operations during the winter to receive

components and materials may require snow removal to ensure safe access to working surfaces. Winter access when required will be in accordance with the Winter Access Plan for the CCSM Project (Appendix E). PCW does not intend to remove snow when the Rail Facility is not in use and no components are in storage. When snow removal is required, snow will be piled in the laydown areas but away from access points to avoid impeding spring access.

The Rail Facility will have security similar to other rural rail terminals. Security will be adjusted based on level of operation and the value of the components in storage. Portions of the laydown yards with high value items, e.g. nacelles and wire, will be fenced and have perimeter lighting. Security cameras covering crucial areas such as the entrance may be used. Security guards will be present onsite after-hours when components are in storage. Personnel requiring after-hours access to the Rail Facility will require prior authorization and their identity will be verified.

6.3 Communications

The Rail Facility will have dedicated radio channels, as well as access to the CCSM Project's safety radio channel. Crane and locomotive operators will maintain visual and radio contact with ground-based crews. Trucks will be required to maintain radio contact with each other, site security, and any escort vehicles. The Rail Facility office trailer will have internet and telephone service.

6.4 Train and Railcar Handling

The Rail Facility is designed to receive trains off the UPRR main line, deliver them efficiently into unloading areas, and then return the empty trains to the UPRR main line. This will be done up to five (5) times a week and the Rail Facility will have the capacity to handle up to three (3) trains at any one time. One of the primary tasks for the Rail Facility is to unload the trains as quickly as possible and release them back to Union Pacific for movement.

When trains arrive at the Rail Facility, the railcars loaded with CCSM Project cargo will be decoupled, and the UPRR locomotives (plus any non-CCSM Project cargo railcars) will use the Rail Facility's loop to turn around and head back out onto the UPRR main line. Most Union Pacific locomotives will also take empty railcars as they leave the Rail Facility.

It will be the responsibility of the Rail Facility's operator (rather than Union Pacific) to move the railcars around the Rail Facility for unloading operations. The Rail Facility will be equipped with yard locomotives that will remain onsite during periods of operations to push railcars into unloading position and other general switching services. PCW expects that such onsite locomotives will be leased (from Union Pacific or a third party) and returned to the lessor at the end of the operational season (section 6.4.2).

6.4.1 Inbound and Outbound Railcars

The Rail Facility's railcar capacity will be actively managed by both the Rail Facility's traffic manager and the servicing railroad (UPRR). Trains that are en route to the Rail Facility have varied transit times and multiple origins. Union Pacific and the Rail Facility's traffic manager must ensure that there is adequate space to bring the train in or hold the train in the UPRR network until space is available at the Rail Facility. Both parties will be in direct contact several times a day during operations to forecast arrival and departure of trains. The time of day of train arrivals will be determined by Union Pacific, and could occur during evening hours. PCW will request that nighttime deliveries be minimized to the extent allowed by the CCSM Project schedule and Union Pacific's system traffic schedule. The Rail Facility's traffic manager will coordinate with the CCSM Project Manager to ensure that movements are accounted for and that unloading times are assigned.

Unit trains will approach the Rail Facility from both directions on the UPRR main line at full operating speed. The unit trains will exit the main line at 30 mph and use the distance of the running track (Track A) to decelerate prior to entering the wye (design speed 20 mph). Depending upon the train lengths, cargo, and schedule, unit trains will then continue into either the loop track or the manifest transload tracks.

Unit trains will be interchanged in the loop between the Union Pacific locomotive and the yard locomotive. The Rail Facility's traffic manager will ensure that a track is cleared and switches set in anticipation of the arriving train. Union Pacific will maintain control of the unit train until it is completely on the unloading or storage track specified by the Rail Facility's traffic manager. Union Pacific will then set the brakes on the train and uncouple. The Rail Facility's traffic manager will acknowledge receipt of the train from Union Pacific and schedule unloading. The Union Pacific locomotive will either leave the Rail Facility empty or pick up a waiting empty train.

Unloaded cars will be identified by the Rail Facility's traffic manager and released back to Union Pacific. Prior to releasing a railcar from the Rail Facility, each railcar will be inspected. Railcars that have mechanical failures that cannot be quickly addressed or that require breakout from unit trains to affect repairs will be moved to the "bad order track" for maintenance. For railcars that pass inspection, Union Pacific will schedule the movement and the physical interchange will occur. Outbound trains and locomotives will wait for inspection, proper timing, and signaling to enter the UPRR main line under standard Union Pacific protocol. Crew changes may also be required. The goal is to match the inbound and outbound volumes so the Rail Facility is not overwhelmed.

6.4.2 Movement and Staging of Railcars

The yard locomotive will be used to advance cars under fixed point unloading areas/cranes or to move a series of cars into linear unloading sidings. Trains carrying tower sections and blades will unload at a fixed point crane on the outer loop track (Track E). Nacelles, hubs, and other

components will be moved to the manifest transload tracks (Tracks K and L) for unloading. Unit trains handled in the manifest transload tracks will have to be broken in half, 50 percent on each track, due to the tracks' lengths. The purpose of this design is to allow the nacelles to be stored directly under the boom radius of the crane. The train will be reassembled in the same order upon departure. The movement of the railcars will be handled by a team of locomotive operators and conductors trained in the proper procedures. At peak delivery and unloading times during the CCSM Project, relocation of railcars within the Rail Facility will likely occur during both day and evening hours to maintain unloading schedules.

6.5 Unloading

The primary purpose of the Rail Facility is to accept wind turbine component deliveries by rail to the CCSM Project Site. Other components delivered to the Rail Facility are anticipated to be items such as transformers, steel poles, cable reels, and substation switchgear. Presently PCW does not anticipate that other construction materials such as aggregate, cement, and sand will be delivered by rail. The general procedures for unloading material and components are provided below. For each turbine component, more specific unloading procedures will be set by the turbine vendors.

Once a component is unloaded from a railcar, it will be loaded onto a truck to either shuttle it to the laydown yards or deliver it to a turbine installation site. The majority of components will be placed in a temporary storage location within the laydown yards. Components will be stored on wood dunnage, metal frames, and/or saddles to elevate them and disperse the weight to prevent sinking into the ground. Components will remain in temporary storage until they are loaded onto a truck for delivery to turbine installation sites.

6.5.1 Nacelles

Modern two to three MW nacelles require a large 300-ton crane to properly lift them. The crane connects to a specialized lifting beam which in turn connects to the internal lifting points of the nacelle (Figure 6-1). Manufacturers build in trap doors for the rigging to pass through the fiberglass surface and continue to the connection points at the base. The nacelles normally have a circular transport and storage foot structure connected to the bottom. This transport fixture will be secured to the railcar by special clamps or clips to hold it during transit (Figure 6-2). Once the crane is connected to the nacelle, the clamps are released and the nacelle is lifted off the railcar. Lines are connected to the nacelle to help prevent any shifting during the lift.

Unloading of nacelles from the Rail Facility, will occur using the manifest transload tracks (Tracks K and L) when possible so that cranes can place the nacelles directly into temporary storage between the tracks or south of Track L. This avoids the need to truck the nacelles into other portions of the laydown yards where they would have to be unloaded by crane again.

Figure 6-1 Rail Transport of Nacelles

Figure 6-2 Rail Offloading of Nacelles

6.5.2 Blades

Delivering blades by rail poses unique issues. Blades are light weight and are much longer than the railcar carrying them. The excess length is accommodated by placing an empty or "idler" car in between two loaded cars (Figure 6-3). The blade tips face in towards each other at different elevations. Blades are unloaded from railcars by either one (1) crane with a lifting beam or two (2) separate cranes working in tandem.

Figure 6-3 Blades on Rail Cars

6.5.3 Tower Sections

Tower sections are lifted from railcars using either one (1) crane with a lifting beam or two (2) cranes using hooks or straps (Figure 6-4). Tower sections may also overhang adjacent railcars. A series of chains and bolts are used to secure the tower sections into steel saddles on the railcars. The riggers remove the lashings prior to lifting.

Figure 6-4 Rail Offloading of Tower Sections

6.5.4 Hubs

Hubs will be lifted using smaller cranes and specialized lifting beams. Hub sizes vary, and some vendors ship their hubs in multiple parts to reduce size. Hubs are also often shipped with multiple hubs per railcar (Figure 6-5).

Figure 6-5 Hubs on Rail Cars

6.5.5 Other Components

Most of the smaller components for the wind turbines such as down tower assemblies, containerized components, and tools will be transported by truck. Many times it is not efficient to move these components by rail due to the short travel distances, the fragile nature and high cost of the components, and the short lead times. While smaller components may not be feasible or efficient to move by rail, components such as transformers, steel poles, cable reels, and substation switchgear will likely be transported by rail.

Non-wind turbine components that arrive by rail will likely arrive via manifest railcar service and be unloaded on one (1) of the manifest tracks (Tracks K and L). Railcars on the manifest tracks will be unloaded by rough-terrain forklifts of appropriate size or by crane if the component requires a top lift.

6.5.6 Construction Materials

PCW does not anticipate that construction materials such as aggregate, cement, and sand will be delivered by rail, with the exception of ballast for the Rail Facility that would arrive during

construction, as described in section 5.6. If deliveries of construction materials were to occur by rail, PCW would stockpile the material in the Rail Facility laydown yards or other laydown areas within the CCSM Project Site. Any special equipment needed for unloading construction materials would be accommodated within the laydown yards adjacent to the Rail Facility's loop tracks or manifest tracks.

6.6 Material and Component Laydown

The Rail Facility will operate 12 hours a day 6 days a week during peak delivery times, with the potential of working a seventh day if productivity is hampered by weather or delivery delays. Operations will be divided into inbound (receiving) and outbound (shipping). Tasks related to laydown operations include inventory management, storage, inspection, and maintenance. The primary laydown yard is designed to store approximately 150 complete sets of turbine components, accommodating up to three (3) different vendors and/or models (Figure 6-6).

The Rail Facility will have up to 180 ac of laydown during construction of the CCSM Project. Wind turbine components will be segregated by vendor and model, and non-wind turbine components will be stored segregated. Management of the laydown yard will focus on keeping receiving operations separate from shipping operations to reduce congestion and increase safety. Wind turbine component storage and distribution will be managed on a first-in, first-out basis.

Figure 6-6 Example Wind Energy Laydown Yard

6.6.1 Nacelles

The area between the manifest transload tracks (Tracks K and L) and south of Track L is designed to allow for nacelles to be unloaded from railcars and moved to temporary storage locations directly under the working radius of crawler cranes. Traffic patterns also allow for the maneuvering of trucks around the area. Nacelles will be stored parallel to the rail tracks for optimum storage efficiency. The nacelle storage design eliminates the need to shuttle nacelles from the rail unloading area to temporary storage locations, reducing the cost and impact of handling nacelles. Portable diesel generators will be used to provide electrical connections for nacelles in storage if required by the vendor.

6.6.2 Blades

Blades will be stored as matched sets as required by the turbine vendors. Blade tips will be oriented away from truck routes to avoid potential damage. At peak times PCW may request that vendors provide stacking fixtures so blades can be stored two-high. As these stacking fixtures can be difficult to obtain (they are commonly in use for trans-ocean transport), the size of the laydown yards is sufficient to allow for storage without stacking blades.

6.6.3 Tower Sections

The laydown yards are designed to store both three (3) and four (4) section towers. Vendors will likely source towers from several manufacturers and the laydown yard design allows for each type of tower to be stored separately. The laydown yards are prepared to receive and segregate all towers regardless of their arrival sequence and mode of transport. There is sufficient room at each tower storage location that the towers can be accessed from either end.

6.6.4 Hubs

Hubs will be stored near the transload track. For vendors that require matched nacelle/hub sets, PCW will label and track each nacelle/hub set.

6.6.5 Truck Deliveries and Other Components

PCW will receive wind turbine components that cannot be shipped by rail by long-distance truck. Truck deliveries that do not go directly to the turbine installation site will be stored in the Rail Facility laydown yards in the same manner as the other turbine components.

Non-wind turbine components will be segregated from the wind turbine components in the laydown yards as their outbound loading requirements and truck types are not as specialized; therefore, they can be moved opportunistically.

6.6.6 Material and Component Transfer

The Rail Facility is projected to use a fleet of about 40 trucks to deliver up to 25 complete turbines per week (approximately 225 oversize loads) to turbine installation sites. Although truck loading will be constant, there will be higher demand at the beginning and end of each day when the empty trucks return. Three (3) crane crews will be dedicated to blade and tower section loading/unloading while a larger fourth crane will be dedicated to nacelle and hub loading/unloading. Inventory will be assigned and controlled by the dispatch clerk.

6.6.7 Winter Storage

While not currently planned, residual inventory may be carried over from one construction season to the next in the Rail Facility laydown yards due to damaged pieces, excess shipments or construction delays. Components requiring storage over the winter months will be consolidated, weatherized, and inspected regularly. Security will be put in place as needed based on the value of the components in inventory and the risk of theft. Portable diesel generators will be used to provide electrical connections for any nacelles in storage if required by the vendor.

6.7 Track Maintenance

The Rail Facility tracks will be inspected regularly, and maintained and repaired as needed. Union Pacific will inspect and maintain the tracks, signals, and switches along the running track (Track A) and portions of the lead tracks (Tracks B and C) between the UPRR main line and the

southern point of the wye junction. PCW is responsible for maintaining the remaining tracks and balance of the Rail Facility. Ongoing maintenance will include qualified crews inspecting and lubricating switches, and inspecting and maintaining tracks, tie plates, spikes, and rail ties on a regular schedule per American Association of Railroads standards.

6.8 Laydown Yard Maintenance

Settling, compaction and seasonal heaving will require that the surface of the laydown yards be periodically leveled to ensure adequate storm water management. This maintenance will generally be completed in the fall and early spring when the laydown area inventory is minimized.

Throughout the use of the laydown yard, additional gravel may be added where needed to address rutting, pot holes, washboarding, or gravel migration that may occur.

7. Decommissioning

This chapter describes the methods and means to decommission the Rail Facility at the end of its useful life. The Rail Facility is expected to be decommissioned the first year after all wind turbines have been removed from the CCSM Project. The timing of decommissioning, however, could differ based on any negotiated transfer of the rights to use the Rail Facility in its entirety or any portion thereof to a third party. PCW anticipates that decommissioning will take approximately four months to complete; likely June through September.

After all components and material associated with decommissioning of the CCSM Project have been removed from the CCSM Project Site, the Rail Facility will be decommissioned. PCW will remove above-ground material such as aggregate, rails, and cross-ties and the site will be reclaimed in accordance with the Rail Facility Reclamation Plan (Appendix L).

7.1 Pre-Decommissioning

Pre-decommissioning activities will occur prior to mobilization of the decommissioning contractor. In general, pre-decommissioning activities for the Rail Facility include coordination and outreach meetings with stakeholders. It is anticipated that a stakeholder workshop will be held to determine the scope and requirements for decommissioning and to insure that current decommissioning standards are met. PCW will use the stakeholder workshop to solicit input from Union Pacific, affected landowners and businesses, as well as appropriate federal, state, and local agencies. Input from the stakeholder meeting will be used to help define the decommissioning scope of work, e.g. roads that will remain in place, recycling and reuse options, and identification of landfill facilities.

Following the stakeholder meeting, PCW will create the final scope of work for decommissioning and a work plan to implement it. PCW will also obtain all permits necessary to complete decommissioning.

7.2 Workforce

During decommissioning, PCW anticipates a constant workforce of about 15 people working 12 hours per day, 6 days per week.

7.3 Equipment

Decommissioning equipment will include excavators, bulldozers, front end loaders, motor graders, water trucks, forklifts, rough terrain cranes, a spike puller, and dump trucks. The demolition contractor will determine the exact numbers of each piece of equipment needed prior to decommissioning.

7.4 Material and Components

The significant materials and components required for construction of the Rail Facility (Table 5-4) will be the same as the materials and components removed during decommissioning. The methods and procedures for removing components and material from the Rail Facility will be similar to those used during construction (section 5.6).

When practical, railcars will be used to transport items for the decommissioning of the Rail Facility. When railcars are not practical, trucks will be used to transport items to approved off-site recycling and disposal facilities. PCW expects that much of the equipment and material removed from the Rail Facility Site early in the decommissioning process will be removed by rail. As the Rail Facility's connection to the UPRR mainline is decommissioned, all equipment and material will be removed by truck.

7.5 Communications

Personnel communications during decommissioning will be maintained via hand-held radios and cellular phones.

7.6 Decommissioning Activities

Decommissioning activities for the Rail Facility are expected to include the following:

- Removal of track, ties, and switches;
- Removal of rail ballast aggregate;
- Removal of rail sub-ballast aggregate;
- Removal of structures;
- Removal of laydown yard and access road aggregate;
- Removal of any temporary facilities;
- Final earthwork to reshape and re-contour the land;
- Placement of any topsoil remaining in storage; and
- Revegetation.

Unloading and material handling equipment for the Rail Facility is mobile and will be removed prior to the commencement of demolition activities. Demolition of the Rail Facility will not require blasting activities.

Decommissioning activities at the Rail Facility require coordination between the PCW decommissioning team and the Union Pacific decommissioning team. Union Pacific requires that all work within the UPRR ROW or on facilities connection to the UPRR mainline be conducted by Union Pacific or its contractors, the Union Pacific decommissioning team will be responsible for decommissioning those portions of the Rail Facility north of the wye track, including the wye track itself. The PCW decommissioning team will be responsible for decommissioning the remainder of the Rail Facility.

7.6.1 Mobilization and Demobilization

The PCW decommissioning team will mobilize a few weeks prior to decommissioning and may bring temporary construction trailers and management staff to the Rail Facility Site. The Union Pacific decommissioning team will likely work out of the existing Union Pacific yard office in Rawlins. Each decommissioning team will have dedicated equipment and material that will be delivered to the Rail Facility Site by truck or rail. Demolition equipment, consisting of excavators, bulldozers, front end loaders, motor graders, water trucks, forklifts, RT cranes, and similar equipment, is mobile and will be brought to the Rail Facility by rail and truck as needed to support the decommissioning process. Both the PCW and Union Pacific decommissioning teams are expected to use local housing options for their staff.

As demolition progresses and equipment is no longer required, it will be removed from the Rail Facility by truck. At the conclusion of the decommissioning, all temporary facilities will be removed along with any remaining equipment.

7.6.2 Temporary Facilities

The temporary construction trailer area used during construction of the Rail Facility will be re-used to house temporary construction trailers during decommissioning. PCW is anticipating that up to two (2) double wide and three (3) single wide temporary construction trailers would be required for the demolition of the Rail Facility. The temporary construction trailer area would also include portable sanitation facilities (portable toilets), fuel storage, waste disposal containers, and parking for personal vehicles. Once the site is prepared, the trailers will arrive to the Rail Facility Site by truck. The trailers will be placed on stands, and the double wide trailers will be connected together. Portable diesel generators will be used to provide electrical service to the trailers. Prior to demobilization of the decommissioning teams, all temporary facilities will be removed and the area will be reclaimed in accordance with the Rail Facility Reclamation Plan (Appendix L).

7.6.3 Track Within UPRR ROW

The Union Pacific decommissioning team will remove all tracks and structures of the wye track and all tracks and structures within the UPRR ROW. Union Pacific will dispatch a qualified contractor or use its own personnel to remove tracks, ties, and ballast. Demolition will proceed from the wye portion of the tracks to the interconnection point with the main line tracks. To the extent possible, materials will be transported by rail. Trucks will be used to remove the final portions of track and structures that interconnect with the UPRR main line.

7.6.4 Track Outside UPRR ROW

Track and material removal by the PCW decommissioning team will be completed by a licensed and qualified demolition contractor. To facilitate the removal of materials by rail, the contractor will begin by removing the rails from the loop track progressing north towards the wye.

7.6.5 Laydown Yards

Decommissioning of the Rail Facility will require temporary laydown yards and equipment and material storage. PCW will use the existing Rail Facility laydown yards for decommissioning. Prior to demobilization of the decommissioning team, the laydown yards will also be reclaimed per the requirements of the Rail Facility Reclamation Plan (Appendix L).

8. Environmental Resources

PCW has planned and will implement all aspects of the Rail Facility to minimize effects to environmental resources, to the extent practicable. The CCSM Project has been thoroughly reviewed and analyzed in the EIS and ROD. Measures will be applied to avoid, minimize, or mitigate potential effects to environmental resources from construction, operation, maintenance, and decommissioning of the CCSM Project as described in Appendix A and this site-specific plan of development. The following sections provide site-specific information on the environmental resources within the Rail Facility Site and the potential effects of the Rail Facility.

8.1 Land Use

The Rail Facility borders the UPRR main line, allowing for the delivery of CCSM Project components and materials with a minimum amount of infrastructure development and effect on nearby communities. Lands in the vicinity of the CCSM Project Site are primarily agricultural and the CCSM Project Site is operated as a cattle ranch by TOTCO. The Rail Facility is located in an industrial corridor adjacent to Interstate 80, the UPRR, and several major interstate gas pipelines (Figure 4-1). The Rail Facility is located approximately two (2) miles south of Interstate 80 and 2.5 miles east of the Wyoming State Penitentiary. The Rail Facility is immediately east of the Rawlins wastewater treatment facility and abuts a corridor containing multiple large interstate gas pipelines. There are no private seasonal or year-round residences within the Rail Facility Site.

The Rail Facility Site is located on a combination of private, state, and federal lands. The lead track and wye connection to the UPRR main line are located entirely on private lands owned by TOTCO and Anadarko, while the remaining portions of the Rail Facility are located on a combination of private, federal, and state lands. The breakdown of land ownership within the Rail Facility is shown in Table 8-1 and illustrated on Figure 2-2.

Table 8-1. Disturbance by Land Ownership

Component	Initial Disturbance (Acres)				Long-term Disturbance (Acres)			
	Private	Federal	State	Total	Private	Federal	State	Total
Wye & Running Track	36.5	---	---	36.5	14.4	---	---	14.4
Lead Track	29.5	---	---	29.5	8.3	---	---	8.3
Loop & Other Track	65.7	37.4	8.9	112.0	31.4	11.3	0.9	43.6
Laydown Areas	124.9	55.8	0.4	181.1	50.4	---	0.4	50.8
Access Road	2.5	8.4	---	10.8	1.3	2.8	---	4.1
TOTAL	**259.1**	**101.5**	**9.3**	**369.9**	**105.7**	**14.1**	**1.3**	**121.2**

8.2 Air Quality

PCW will comply with all federal, state, and local emissions standards for air quality. PCW has incorporated the measures from the ROD, as detailed in Appendix A, to minimize impacts to air quality. Air pollutants emitted during construction, operation, maintenance, and decommissioning of the Rail Facility include particulates (fugitive dust) from vehicle traffic and construction activities, as well as nitrogen dioxide (NO_2), carbon monoxide (CO), and sulfur dioxide (SO_2) from engines powering construction equipment and other mobile sources. Emissions of fugitive volatile organic compounds would be very small compared to other local sources including refineries, power plants, oil and gas development, interstate traffic, and other area sources.

Air emissions from the Rail Facility were considered in the EIS. Emissions generated during construction, operation, maintenance, and decommissioning of the Rail Facility will be consistent with those evaluated in the EIS for the CCSM Project (BLM 2012a). The equipment inventory for the construction, operation, maintenance, and decommissioning of the Rail Facility is shown in section 5.4, Table 5-3 of this site-specific plan of development. The equipment inventory analyzed in the EIS is shown in section 3.3.

Maximum pollutant emissions associated with the Rail Facility would be temporary and associated with construction and decommissioning. Construction and decommissioning involve the use of earth-moving equipment, including loaders, scrapers, bulldozers, shovels, and backhoes. Air emissions during O&M include emissions from trains as well as the equipment used to unload and load materials.

Although the Rail Facility would emit low levels of pollutants principally from mobile sources during construction and decommissioning, the net effect of the CCSM Project would be to improve atmospheric conditions since it would be in support of generation of electricity from wind turbines that would reduce the need for electricity generated in fossil fuel-fired power plants (BLM 2012a). Taking into account the emissions estimated for the entire CCSM Project and air quality impacts of other projects in the area, BLM concluded that increases in concentrations of CO, NO_X, SO_2, PM_{10}, and $PM_{2.5}$ in the vicinity of CCSM Project would be unlikely to exceed federal or state ambient air quality standards (BLM 2012a).

8.3 Soils

Soils within the Rail Facility are primarily derived from sedimentary formations and are predominantly orthents. These are soils that are shallow to very deep and medium to fine textured and have a frigid temperature regime, an aridic moisture regime, and mixed or bentonitic mineralogy.

Geotechnical testing for the Rail Facility was completed at 33 boring locations with drilling depths ranging from 10 ft to 40 ft (Fugro 2013). The results of this geotechnical testing indicate that the Rail Facility is underlain by deep alluvial fine-textured soils and that depth to bedrock is generally 20 ft or greater.

Soils adjacent to the UPRR are characterized by two (2) to five (5) ft of fill material overlaying deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. Bedrock was not encountered during geotechnical testing in the area adjacent to the UPRR. The remaining areas of the Rail Facility south of the UPRR are characterized by deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. No fill materials are present in the soils south of the UPRR. Steele Shale bedrock formations were encountered at locations within the southern third of the Rail Facility Site at depths generally ranging from 20 to 25 ft below ground surface.

The Rail Facility is located in an arid environment that contains potentially erosive soils. Surface disturbing activities may result in exposed soils, accelerated soil erosion, and reduced soil productivity. The amount of initial and long-term disturbance associated with the Rail Facility is shown in section 3.6 and 8.1. To minimize erosion potential from the Rail Facility, PCW will implement the measures described in Appendix H. The Rail Facility is also located in an area that is generally flat with all slopes being significantly less than 25 percent to avoid effects to potentially sensitive soils and to minimize activities in areas identified as having limited reclamation potential.

In addition to implementing the measures detailed in Appendix A, PCW will implement the Rail Facility Reclamation Plan (Appendix L), Erosion Control Plan (Appendix H) and SWPP Plan (Appendix I) to minimize effects of the Rail Facility on soil resources and watersheds. These plans include erosion control measures and soil handling protocols to avoid, minimize, or

mitigate effects from surface disturbing activities. These measures control surface runoff and erosion and ensure biophysical conditions are maintained for reclamation. Erosion control measures and structures are specified in Appendix B the Rail Facility Issued for Permit Plans; these structures will be inspected and maintained as outlined in the SWPP Plan.

8.4 Vegetation

The Rail Facility Site is primarily characterized by areas of salt desert shrub and sagebrush steppe. Sparsely vegetated, grassland, riparian, and barren communities are also present in the Rail Facility Site, but make up only a small percentage of the vegetation communities. Vegetation communities were confirmed by SWCA Environmental Consultants (SWCA) in 2012 and 2013 across the CCSM Project Site, including the areas surrounding the Rail Facility. State of Wyoming and Carbon County listed noxious and invasive species within the Rail Facility Site are identified in the Weed Management Plan (Appendix J). Wetland delineation data was collected in 2012 and 2013 to characterize the wetland plant communities within the Rail Facility Site, as further discussed in section 8.5.2 and Appendix K of this site-specific plan of development. Table 8-2 includes a summary of the vegetation communities within the Rail Facility Site.

Table 8-2. Vegetation Communities within the Rail Facility Site

Vegetation Community	Acreage	Percentage
Shadscale saltbush	116.1	31.4%
Gardner's saltbush/greasewood	79.1	21.4%
Wyoming big sagebrush/threadleaf sedge	38.5	10.4%
Wyoming big sagebrush/greasewood	23.0	6.2%
Shadscale saltbush/Wyoming big sagebrush	21.7	5.9%
Gardner's saltbush	20.9	5.6%
Greasewood/saltbush/basin big sagebrush	15.1	4.1%
Threadleaf sedge	5.9	1.6%
Wyoming big sagebrush/bird's foot sagebrush	5.4	1.5%
Other[1]	13.2	3.6%
Disturbed/developed	31.1	8.4%
TOTAL	369.9	100.0%

Notes:

(1) Greasewood, shadscale saltbush/black sagebrush, Wyoming big sagebrush/rabbitbrush, and greasewood/saltgrass each make up less than 1 percent of the total acreage of the Rail Facility Site

8.4.1 Saltbush (*Atriplex* spp.) Communities

The saltbush (*Atriplex* spp.) cover type is dominated by Gardner's saltbush (*A. gardneri*) and shadscale (*A. confertifolia*). Gardner's saltbush is a subshrub, which is woody at its base and seldom grows higher than 16 inches. It grows on alkaline soils of barren plains and hills. Shadscale is a relatively compact spiny shrub, also tending to grow in alkaline soils on plains and hills. Shadscale normally grows in dense clumps and ranges from 1 to 3 feet in height (Simonin 2001).

8.4.1.1 Gardner's Saltbush (Atriplex gardneri) Communities

Gardner's saltbush is most commonly found on saline, poorly developed, or clayey soils with a pH ranging from 7.8 to 8.6 (NatureServe 2014). Pure stands of Gardner's saltbush generally occur on Saline Lowland, Clayey, Saline Upland Ecological Sites. Soils are typically low in available phosphorous, nitrogen and potassium. Gardner's saltbush also grows on sodic, silty or sandy soils, usually on harsh and arid sites (generally 7-9 inch precipitation zones), with widely fluctuating temperatures and high winds. Gardner's saltbush is a spreading, low growing, evergreen, perennial member of the goosefoot family (Chenopodiaceae). It is often called a sub-shrub being woody at the base. It grows from 8-20 inches in height and has alternate, gray-green leaves up to 2 inches long. The plant has a highly branched deep root system, with lateral spread up to 7 feet. The species tolerates poor site conditions and is used to stabilize soils and to reclaim disturbed areas.

8.4.1.2 Gardner's Saltbush/Greasewood (Sarcobatus vermiculatus)

This sub-association is generally found on Saline Lowland and Clayey Ecological Sites in 7-9 inch precipitation zones. Black greasewood (*Sarcobatus vermiculatus*) can occur in pure stands or in association with saltbush species (NatureServe 2014). Greasewood is a native flowering perennial, with an erect to low growing growth form that can reach 10 feet tall and 3-6 feet across. Greasewood is halophytic and associated with saline and alkaline soils with a pH ranging from 6.2-9.8. This association occurs on moderately steep to steep eroded slopes or on toeslopes composed of clay or shale sediments. The majority of the ground surface (80%) is comprised of bare ground and gravels. The vegetation is characterized by a sparse to moderately dense (20-40% cover) woody layer co-dominated by Gardner's saltbush and greasewood. Other shrubs and dwarf-shrubs include scattered basin big sagebrush, bud sagebrush *(Picrothamnus desertorum),* shadscale saltbush *(Atriplex confertifolia),* rubber rabbitbrush *(Ericameria nauseosa),* broom snakeweed (*Gutierrezia sarothrae),* winterfat (*Krascheninnikovia lanata*), Pursh seepweed (*Suaeda calceoliformis),* and spineless horsebrush (*Tetradymia canescens)*. If present the graminoid layer is typically sparse and may include Sandberg bluegrass (*Poa secunda*), Indian ricegrass (*Achnatherum hymenoides),* bottlebrush squirreltail (*Elymus elymoides)*, and the introduced annual- cheatgrass (*Bromus tectorum)*. The forb layer is made up of annual species and therefore varies in cover and composition.

Common perennial forbs include hoary tanyaster (*Machaeranthera canescens),* povertyweed (*Iva axillaris),* and textile onion (*Allium textile)*.

*8.4.1.3 Shadscale Saltbush (*Atriplex confertifolia*) Communities*

These open to sparse shrublands are dominated by shadscale saltbush but lack other diagnostic species (NatureServe 2014). These communities are widespread across western and central Wyoming. Pure stands of shadscale saltbush may occur on Saline Upland, Clayey, Sandy, Loamy, or Shale Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. In general stands occur on hills, ridges, and toeslopes, where soils are often shallow clays or clay loams (and occasionally sandy soils) derived from marine shales, with a high percentage of bare ground and gravel at the surface. Vegetation cover is generally sparse, not exceeding 35%. The short-shrub canopy is dominated by shadscale saltbush with other associated species, including buckwheat, Gardner's saltbush, yellow rabbitbrush, and shortspine horsebrush. The herbaceous layer varies from sparse to relatively dense, and may comprise Indian ricegrass, bluebunch wheatgrass, and Sandberg bluegrass.

8.4.1.4 Shadscale Saltbush/Black Sagebrush (Artemisia nova)

This sub-association occurs on Shale, Sandy, and Shallow Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This plant association typically has sparse vegetation cover, and low plant diversity (NatureServe 2014). Shrubs are typically scattered with wide interspaces and few herbaceous understory species; biological soil crusts are sometimes prevalent. Shadscale and black sagebrush communities may form a mosaic with the black sagebrush dominating on lower elevations, less saline and less alkaline sites than shadscale saltbush.

8.4.1.5 Shadscale Saltbush/Wyoming Big Sagebrush (Artemisia tridentata ssp. wyomingensis)

This sub-association may occur in Saline Upland, Shale, Loamy, and Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This sub-association is found irregularly in xeric, alkaline sites where slopes tend to be gentle to moderate, and the relatively deep, alkaline soils may be modified by a thin layer of alluvial or colluvial deposits (NatureServe 2014). Stands are codominated by shadscale saltbush and Wyoming big sagebrush. The understory tends to be sparse and inconsistent in its composition.

8.4.2 Greasewood Communities

Black greasewood is a native flowering perennial with an erect to low spreading growth form reaching 10 feet tall and 3-6 feet across (NatureServe 2014). On saline sites greasewood may grow in nearly pure stands or in association with saltbushes (*Atriplex* spp.). Greasewood typically occurs in areas receiving 3-20 inches of annual precipitation and is often confined to

alkali-sodic soils in alluvial areas, floodplains, dry washes, and gullies where soil moisture is high. Soil pH typically ranges from 6.2 to 9.8 and surface soils are typically rich in sodium and other cations. Pure stands of greasewood occur primarily on Saline Lowland and Saline Upland Ecological Sites where the water table remains high enough to maintain vegetation, despite salt accumulations. This community usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood. Other shrubs that may be present or codominant in some occurrences include shadscale saltbush, Gardner's saltbush, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis),* basin big sagebrush, silver sagebrush (*Artemisia cana* ssp. *cana)*, or winterfat. Occurrences are often adjacent to mixed salt desert scrub or big sagebrush shrublands. Graminoids dominate the herbaceous layer, when present; common species include alkali sacaton (*Sporobolus airoides),* western wheatgrass, saltgrass *(Distichlis spicata)*, bluegrass (*Poa* sp.*),* Nuttall's alkaligrass *(Puccinellia nuttalliana)*, or common spikerush (*Eleocharis palustris)*.

8.4.2.1 *Greasewood/Saltbush/Basin Big Sagebrush (*Artemisia tridentata *ssp*. tridentata*)*

This sub-association occurs on Saline Lowland, Sandy, Loamy, and Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association is characteristic of stream terraces and floodplains and the presence of other shrubs in the canopy indicates less saline conditions than pure stands of greasewood (NatureServe 2014). Soils are typically saline, deep and generally sandy, but a few sites are on well-drained silt loams or clays. Total shrub cover for this association is typically between 5 and 30%. The typical sagebrush element is basin big sagebrush but Wyoming big sagebrush may also occur. The sagebrush and the greasewood component can vary in terms of their cover dominance. Four-wing saltbush is also co-dominant with rubber rabbitbrush and yellow rabbitbrush (*Chrysothamnus viscidiflorus)* as other common minor elements of the shrub canopy. Understory cover varies from sparse to dense and non-native species may persist.

*8.4.2.2 Greasewood/Saltgrass (*Distichlis spicata*)*

This sub-association occurs mainly on Saline Lowland Ecological Sites in 7-9 inch precipitation zones. This association is found on broad floodplains, along large rivers and streams, on the margins of upland seeps, and often occurs around playas dominated by saltgrass (NatureServe 2014). Sites typically undergo intermittent flooding and substrates are deep, alkaline, saline and generally have fine-textured soils with a perennial high water table. The association is characterized by a fairly open to moderate shrub canopy (18-60% cover) dominated by greasewood with a herbaceous layer dominated by saltgrass (10-80% cover). Other associated shrubs and dwarf-shrubs may include rubber rabbitbrush, broom snakeweed, and spineless horsebrush. The graminoid layer may include alkali sacaton, mountain rush (*Juncus balticus)* and basin wildrye (*Leymus cinereus)*. The forb layer is typically sparse, though may be dominated by seepweed (*Suaeda* sp.*),* povertyweed*,* and ipomopsis (*Ipomopsis* spp.).

8.4.3 Wyoming Big Sagebrush Communities

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is a variety of big sagebrush and is closely related to mountain big sagebrush. Wyoming big sagebrush overlaps in range and elevation with basin big sagebrush (NatureServe 2014). Plants are considerably smaller than those of basin big sagebrush, usually less than 0.9 m tall, and have main stems branching from the ground. Flowering stems are not as widely branching as those of the basin variety, but otherwise closely resemble that subspecies. Leaves are typically shorter, from 1 to 1.5 cm long, and flabelliform. The range of mountain big sagebrush and Wyoming big sagebrush overlap and are known to hybridize with each other.

Pure stands of Wyoming big sagebrush mainly occur on Loamy Ecological Sites, with some on Sandy and Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. Wyoming big sagebrush steppe communities are prevalent in the West (NatureServe 2014). The species is a native long-lived shrub, generally 18-30 inches tall with rounded uneven crowns. The species typically occurs on foothills, undulating terraces, slopes and plateaus but also occurs in basins and valley bottoms. It is most commonly found on frigid, mesic, and xeric soils of silty, clayey, skeletal and mixed textures. Soil pH varies from moderately acidic to moderately basic. Species diversity is relatively low in Wyoming big sagebrush communities; common associates may include fringed sagebrush, broom snakeweed, western wheatgrass, Sandberg bluegrass, bluebunch wheatgrass, bottlebrush squirreltail, Idaho fescue (*Festuca idahoensis*), Thurber needlegrass (*Achnatherum thurberianum*) and needle-and-thread grass.

*8.4.3.1 Wyoming Big Sagebrush/Bird's Foot Sagebrush (*Artemisia pedatifida*)*

This sub-association occurs entirely on Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association commonly occurs on alkaline clay and clay-loam soils (NatureServe 2014). The Wyoming big sagebrush component tends to grow on the shallowest, most well-drained, and hottest soils of the site. Common understory associates include Indian ricegrass, needle-and-thread, threadleaf sedge, Idaho fescue, bottlebrush squirreltail, bluebunch wheatgrass, fringed sagebrush, and winterfat.

8.4.3.2 Wyoming Big Sagebrush/Greasewood

This sub-association mainly occurs on Clayey and Shallow Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association is characteristic of valley bottom positions and the presence of other shrubs in the canopy indicates less saline conditions than pure stands of greasewood (NatureServe 2014). Soils are typically saline, deep and generally sandy, but a few sites are on well-drained silt loams or clays. Total shrub cover for this association is typically between 5 and 30%. The typical sagebrush element is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis),* but basin big sagebrush (*Artemisia tridentata ssp. tridentate)*

may also occur. The sagebrush and the greasewood component can vary in terms of their cover dominance. Four-wing saltbush (*Atriplex canescens),* is also co-dominant with rubber rabbitbrush (*Ericameria nauseosa)*, and yellow rabbitbrish (*Chrysothamnus viscidiflorus)* as other common minor elements of the shrub canopy. Understory cover varies from sparse to dense and non-native species may persist.

8.4.3.3 Wyoming Big Sagebrush/Yellow Rabbitbrush (Chrysothamnus viscidiflorus)

This sub-association occurs on Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. Yellow rabbitbrush is a native perennial, warm season shrub that grows 1-3 feet in height (NatureServe 2014). It inhabits dry open areas on plains, valley bottoms, foothills and mountains. This association occurs on sites that are flat to gently sloping. The ground surface has moderate to high cover of bare soil and litter. The vegetation is characterized by a relatively open (25% cover) shrub canopy co-dominated by Wyoming big sagebrush and yellow rabbitbrush with a sparse herbaceous layer. Other shrubs and dwarf-shrubs may be present including fringed sagebrush, rubber rabbitbrush, and greasewood. Herbaceous vegetation is typically sparse but may include threadleaf sedge, bottlebrush squirreltail*,* and basin wildrye*.*

*8.4.3.4 Wyoming Big Sagebrush/Threadleaf Sedge (***Carex filifolia***)*

This sub-association generally occurs on Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. The Wyoming big sagebrush component occurs in an open shrub canopy, while threadleaf sedge is abundant in the understory (NatureServe 2014). Other common understory associates include needle-and-thread, plains prickly pear*,* woolly pod milkvetch *(Astragalus purshii),* and hooded phlox (*Phlox hoodii)*.

8.5 Water Resources

The Rail Facility is located within Division 1 of the Wyoming State Engineer's Office (SEO) and includes waters in the North Platte River drainage. The Rail Facility has the potential to impact water resources through water use, as well as through erosion and sedimentation from construction, operations, maintenance, and decommissioning activities. PCW will implement the measures described in Appendix A to minimize impacts to water resources from the Rail Facility. PCW has also developed a SWPP Plan (Appendix I) and Erosion Control Plan (Appendix H) to further minimize impacts to water resources. PCW is also implementing the Watershed Monitoring Plan for the CCSM Project to detect impacts to watersheds from the CCSM Project for early identification and management. Erosion control is discussed further in section 8.3 and Appendix H of this site-specific plan of development.

PCW will use a combination of surface water, groundwater, and municipal water resources to meet the water demands of the Rail Facility during construction, operations, maintenance, and decommissioning. TOTCO owns numerous water rights within the Ranch far in excess of the

amounts required to construct, operate, maintain, and decommission the Rail Facility. These rights are generally approved for irrigation, domestic, and stock watering uses. The temporary or permanent change of these existing water rights for use on the CCSM Project has been negotiated with TOTCO. Additional options to meet long term water supply needs include purchasing bulk water and negotiating a water supply agreement with the City of Rawlins and/or Town of Sinclair.

The water supply for the Rail Facility takes into consideration environmental concerns along with water resource availability and infrastructure needs. Where possible, PCW will make use of existing water resources and infrastructure by using existing water rights, as well as taking advantage of municipal supplies when available. Throughout construction, operation, maintenance, and decommissioning, PCW will work to minimize water demand and make the most efficient use of the water resources available.

8.5.1 Watershed

The Rail Facility is located within Division 1 of the Wyoming SEO and includes waters in the North Platte River drainage, Sugar Creek (HUC10 1018000210) and North Platte River-Iron Springs Draw (HUC10 1018000301) sub-watersheds. Named surface waters within the Rail Facility Site include Sugar Creek, a perennial stream. Multiple unnamed ephemeral drainages that are tributary to Sugar Creek are also present. The estimated initial and long-term disturbance associated with the Rail Facility is broken down by watershed in Table 8-3 for comparison to the analysis contained in the EIS.

Table 8-3 Rail Facility Disturbance by Sub-Watershed

Sub-watershed Name	Sub-watershed Total Area (acres)	Initial Disturbance		Long-term Disturbance		Stream Crossings in sub-watershed
		acres	percent	acres	percent	
NORTH PLATTE BASIN						
North Platte River-First Cottonwood Draw	46,942	--	--	--	--	--
Little Jack Creek	35,771	--	--	--	--	--
Upper Sage Creek-North Platte River	40,935	--	--	--	--	--
Rasmussen Creek	23,488	--	--	--	--	--
Lower Sage Creek-Upper North Platte River	20,079	--	--	--	--	--
Miller Creek	28,571	--	--	--	--	--
Upper Little Sage Creek	30,732	--	--	--	--	--

Sub-watershed Name	Sub-watershed Total Area (acres)	Initial Disturbance		Long-term Disturbance		Stream Crossings in sub-watershed
		acres	percent	acres	percent	
Lower Little Sage Creek	16,898	--	--	--	--	--
North Platte River-Coal Mine Draw	34,326	--	--	--	--	--
North Platte River-Lost Springs Draw	47,020	--	--	--	--	--
Iron Springs Draw	18,853	--	--	--	--	--
Hugus Draw	35,341	--	--	--	--	--
Grenville Dome	22,059	8.5	0.04%	2.8	0.01%	0
Pass Creek-Stage Station Springs	34,785	--	--	--	--	--
Middle Sugar Creek	24,897	--	--	--	--	--
Lower Sugar Creek	42,909	42.5	0.1%	16.2	0.04%	5
101800021304 (Sugar Creek)	11,042	318.9	2.89%	102.2	0.92%	4
North Platte Basin Subtotals	**514,648**	**369.9**	**0.48%**	**121.2**	**0.16%**	**9**
WHITE-YAMPA BASIN						
North Fork Savery Creek	30,812	--	--	--	--	--
Little Savery Creek	30,995	--	--	--	--	--
Muddy Creek-Littlefield Creek	32,259	--	--	--	--	--
McKinney Creek	30,433	--	--	--	--	--
White-Yampa Basin Subtotals	**124,499**	**0**	**0%**	**0**	**0%**	**0**
TOTAL	**639,147**	**369.9**	**0.48 %**	**122.2**	**0.16%**	**9**

8.5.2 Wetlands

Wetland delineations were completed for the Rail Facility Site in fall of 2012 and spring of 2013. A total of 21.36 ac of wetlands consisting of riverine palustrine emergent wetlands and palustrine scrub-shrub wetlands and 0.14 ac of other waters were mapped within the Rail Facility Site. All of the mapped wetlands and other waters are in the Missouri River Region and the North Platte River basin. The major drainage crossed by the Rail Facility is Sugar Creek.

The locations, types, and acres of wetlands within the Rail Facility Site are documented in the Aquatic Resource Inventory for the Rail Facility (Appendix K) and shown on Figure 8-1. In addition to wetlands, the Aquatic Resource Inventory Report identified Sugar Creek as a Waters of the United States. PCW will work with the U.S. Army Corps of Engineers to permit any disturbances within jurisdictional wetlands and waters. The measures described in Appendix A will be used to minimize potential impacts to wetlands and other water bodies.

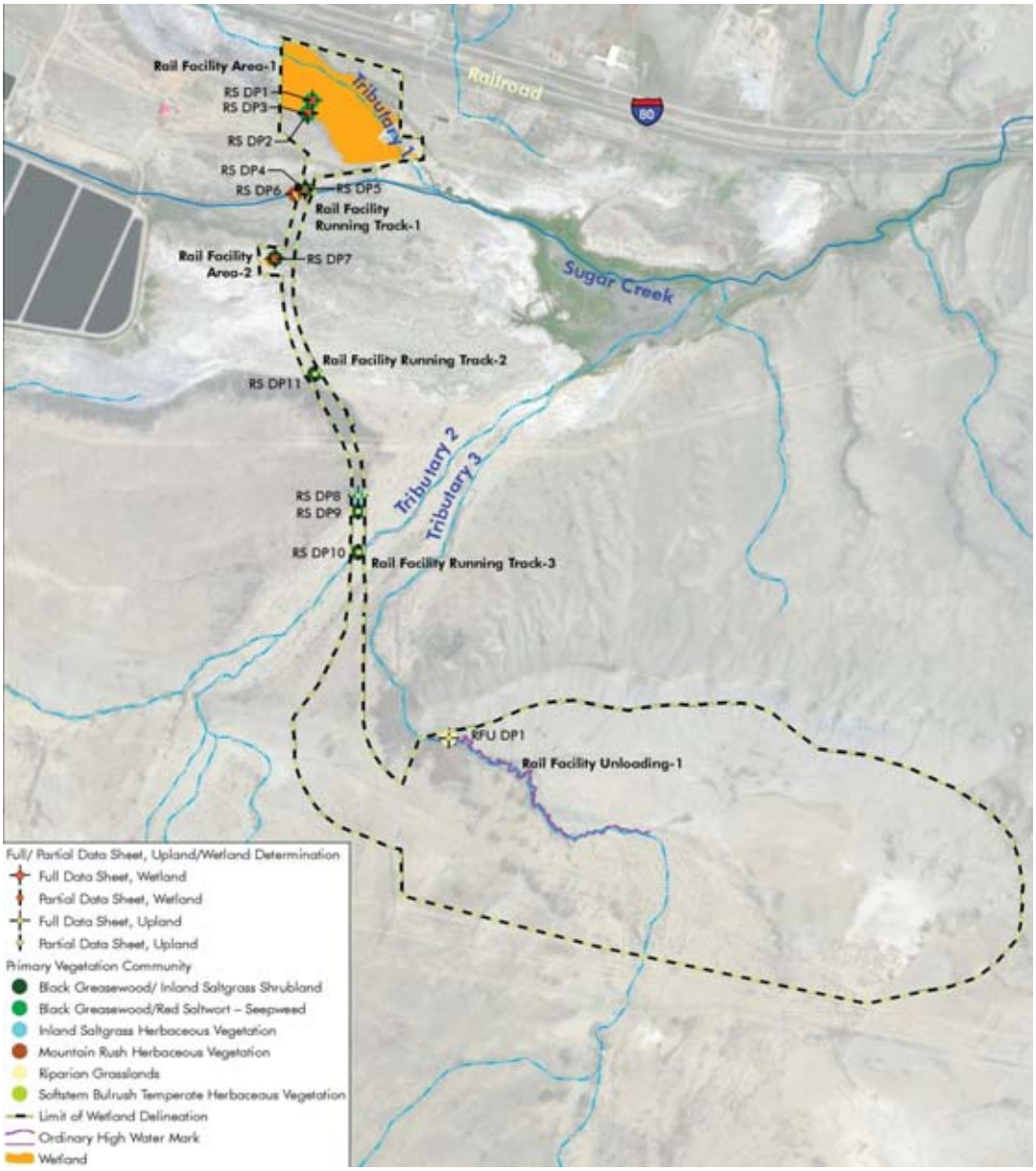

Figure 8-1 Wetlands and Waters of the United States within Rail Facility Site

8.5.3 Water Usage

PCW estimates it will use approximately 22 ac-ft of water for construction of the Rail Facility. Water use for the Rail Facility will primarily be for dust suppression, with some water used for compaction during construction. PCW is requesting that BLM approve the use of magnesium chloride for dust suppression to minimize water demands and the vehicular traffic associated with dust suppression activities; the Rawlins RMP allows for the use of magnesium chloride (BLM 2008).[4] Using magnesium chloride for dust suppression may reduce water demands by as much as 30 percent, reducing water consumption at the Rail Facility to 15 ac-ft during construction.

8.5.4 Water Supply

A combination of water sources will be used to supply water to the Rail Facility for construction, operation, maintenance, and decommissioning. Water resources will be used in compliance with all applicable Wyoming SEO rules and regulations.

Construction of the Rail Facility will occur in 2014 and 2015 simultaneously with the construction of the water extraction facilities for the CCSM Project; thus, alternate water supplies are required to construct a portion of the Rail Facility until the CCSM Project water extraction facilities are available. PCW intends to meet a portion of the construction demand for the Rail Facility, up to five (5) ac-ft per year in 2014 and 2015, with municipal supplies from the City of Rawlins and/or the Town of Sinclair. Preliminary analysis and discussions with the City of Rawlins and Town of Sinclair indicate that temporary supplies of bulk water are available for purchase and use on the Rail Facility, subject to approval. The long-term water supply will be brought on-line as soon as possible to minimize demand for temporary municipal supplies.

Municipal water from the Town of Sinclair would be obtained from a tap located north of Interstate 80 and south of the UPRR main line in Section 21 of Township 21 N, Range 86 W of the Sixth Principal Meridian. Municipal water from the City of Rawlins would be obtained from a tap on the City of Rawlins waste water treatment plant property located in Section 23, Township 21 N, Range 87 W of the Sixth Principal Meridian. As an alternative to using municipal supplies during construction of the Rail Facility, PCW will obtain water from TOTCO, specifically water from the Miller Hill No. 3 well (Table 8-4). Water from the Miller Hill No. 3 well will be hauled by truck from the well to the Rail Facility Site via Highway 71 (Sage Creek Road) and Interstate 80.

Water for the operation, maintenance, and decommissioning of the Rail Facility will be obtained from the CCSM Project water facilities. The long-term water supply for the CCSM Project involves extracting water from the North Platte River and using existing groundwater

[4] In accordance with current BLM policy, PCW will not apply chloride compounds or lignin derivatives within 500 feet of a perennial stream on federal lands.

sources on the Ranch opportunistically to supplement the surface water supply. As an alternative to using the North Platte River to meet the temporary and permanent water demands of the CCSM Project, PCW is in discussions with the City of Rawlins to provide a supply of raw and treated water to the CCSM Project, subject to approval by the Rawlins City Council and the Wyoming SEO. Table 8-4 details the water rights that will be used to supply the Rail Facility. A detailed discussion of the water extraction facilities for CCSM Phase I is included in the Phase I Haul Road and Facilities Site-specific Plan of Development.

Table 8-4. Rail Facility Water Supply Sources

Water Right Name	Type/Source	Permit Number	Maximum Annual Use for Rail Facility (ac-ft)
Savage No. 1	Direct Flow North Platte River	7883	40
Savage No. 2	Direct Flow North Platte River	7884	40
Miller Hill No. 3	Groundwater Non-Tributary	106432	15
City of Rawlins	Municipal	N/A	5[1]
Town of Sinclair	Municipal	N/A	5[2]

Notes: [1]Maximum requested amount must be available and approved by Rawlins City Council and Wyoming State Engineer
[2]Maximum requested amount must be available and approved by Sinclair Town Council and Wyoming State Engineer

The U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) for the CCSM Project (BLM 2012b) evaluated the potential impacts of water depletions for the CCSM Project. The BO concluded that because the CCSM Project is utilizing existing water rights it is already accounted for as an existing system depletion. The BO further stated that the CCSM Project is not likely to jeopardize the continued existence of the federally endangered whooping crane, interior least tern, and pallid sturgeon, or the federally threatened northern Great Plains population of the piping plover, or western prairie fringed orchid, in the central and lower Platte River. Additionally, the BO concluded that the CCSM Project is not likely to destroy or adversely modify designated critical habitat for the whooping crane. No surface water will be withdrawn from within the Colorado River Basin and no impacts to downstream listed fish species would occur.

8.6 Range Resources

The Rail Facility Site is currently used for grazing by livestock (primarily cattle) on a single grazing allotment. Grazing by big game wildlife species also occurs within the Rail Facility Site and consists primarily of mule deer, elk and pronghorn. Private, state, and public lands are currently administered as grazing allotments and the Rail Facility Site is included in the Pine

Grove/Bolten Allotment. Range resources within the Pine Grove/Bolten Allotment are currently managed at 10 acres/AUM with approximately 12,800 AUMs for the entire grazing allotment (BLM 2008a, 2012b). The long term disturbance associated with the Rail Facility Site will impact approximately 0.04 percent of the entire allotment and 0.09 percent of the available AUMs.

Range improvements have taken place throughout the Pine Grove/Bolten Allotment to minimize the impacts of grazing and maintain proper functioning conditions (PFCs). Range improvements include fences, wells, developed springs, and sagebrush treatments (BLM 2012b). The Pine Grove/Bolten allotment is currently managed within an intensive rotation system with five adjacent allotments in which grazing is rotated during the growing season among several pastures within each allotment to provide complete growing season rest during alternate years. Range improvements have resulted in increased soil stabilization and infiltration, decreased runoff, and enhanced riparian vegetation health (BLM 2012b, 2014). In 2013, the BLM assessed PFCs for healthy rangeland management for the Pine Grove/Bolten Allotment and two additional allotments managed by TOTCO, and concluded that all allotments have improved conditions and meet BLM Rangeland Health Standards (BLM 2014).

8.7 Reclamation

A Reclamation Plan has been developed for the Rail Facility Site (Appendix L) to document the site-specific methodologies, monitoring, and reporting requirements for reclaiming disturbed areas on federal lands. The Reclamation Plan identifies the Ecological Sites that occur in the Rail Facility Site and documents the reclamation standards, site and soil characteristics, and Ecological Site-specific conditions and revegetation methods that will be implemented. While the preference is to implement these measures on private lands and state lands, specific measures on private lands and state lands may vary and will be developed to meet the requirements of WYDEQ-LQD in coordination with private landowners, Wyoming Industrial Siting Council, the State Land Board and the WGFC, as appropriate.

Disturbance will occur within five (5) ecological sites as part of the construction, operation, maintenance, and decommissioning of the Rail Facility (Table 8-5). Temporary disturbance will be approximately 370.0 acres, the majority of which (87.9 percent) will occur in saline upland, saline lowland, and sandy ecological sites. Following reclamation, approximately 121.2 acres of long-term disturbance will remain the majority of which (86.6 percent) will be in saline lowland, saline upland, and sandy ecological sites.

Table 8-5. Temporary and long-term disturbance in ecological sites for the Rail Facility Site

Ecological Site	Initial Disturbance	Long-term Disturbance			
		(acres)			
	(acres)	Rail Access Road	Laydown Yards	Rail	Total
Saline Upland 7-9 Inches	133.2	3.0	7.4	13.3	23.8
Saline Lowland 7-9 Inches	119.3	0.0	37.5	25.2	62.7
Sandy 7-9 Inches	72.9	0.8	5.9	11.8	18.5
Clayey 7-9 Inches	14.3	0.0	0.0	3.6	3.6
Developed/Disturbed	30.4	0.3	0.0	12.3	12.6
Grand Total	**369.9**	**4.1**	**50.8**	**66.3**	**121.2**

Limited reclamation potential areas likely occur in portions of the Rail Facility Site. These include areas of slopes greater than 25 percent and southerly aspects, sandy and clayey soils, and areas with saline conditions. Areas of slopes greater than 25 percent and southerly aspects will be avoided to the extent possible. Saline ecological sites contain soil conditions that are difficult to reclaim due to low strength and high erosive potential and seed sources for suitable plant species in these saline environments are often limited. Limited recreation potential areas with the greatest limitations within the Rail Facility Site are in areas of strongly saline and or seleniferous soils (Saline and Saline Lowland ecological types). Plant species within these ecological sites (saltbush [*Atriplex* spp.], greasewood [*Sarcobatus vermiculatus*], grooved milkvetch [*Astragalus bisulcatus*], and woodyaster [*Xylorhiza glabriuscula*]) indicate high salt and or selenium content. These soils are generally more difficult to reclaim due to poor topsoil suitability and seed source for suitable plant species are limited.

8.8 Wildlife

The Rail Facility Site is used by a number of wildlife species. In developing the CCSM Project, PCW has worked in close cooperation with Wyoming Game and Fish Department (WGFD), BLM, and USFWS to develop survey protocols and avoidance, minimization and mitigation measures for wildlife species. Baseline wildlife occurrence information has been collected by SWCA since 2010 throughout the CCSM Project. Site-specific surveys for the Rail Facility were completed in 2012 and 2013 and are documented in the Rail Facility Wildlife Survey Report (Appendix N) and Rail Facility Rare Plant Survey Report (Appendix O).

8.8.1 Big Game

Big game species that may be present within the Rail Facility include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and pronghorn (*Antilocapra americana*) (WGFD 2013). Big

game seasonal ranges were identified for the Rail Facility using the big game seasonal ranges designated by WGFD (BLM 2012a p. 3.14-3, 3.14-4, and 3.14-6).

8.8.1.1 Mule Deer

The Rail Facility Site overlaps with the Platte Valley (Unit #541) Mule Deer Herd Unit. The northern half of the Rail Facility Site falls outside of any identified crucial range for mule deer although the habitat is identified as winter/yearling habitat by WGFD. The southern half of the Rail Facility Site is located on the northern boundary of identified crucial winter-yearlong range for mule deer.

8.8.1.2 Elk

The Rail Facility Site overlaps with the Sierra Madre (Unit #425) Elk Herd Unit. The Rail Facility Site contains no defined habitat areas or migration routes for elk.

8.8.1.3 Pronghorn

The Rail Facility Site overlaps with the Iron Springs (Unit #630) Pronghorn Herd Unit. The Rail Facility Site contains no crucial habitat for pronghorn although the entire area is identified as winter/yearling habitat. One mapped migration route passes through 0.3 mile of the southeastern portion of the Rail Facility Site.

8.8.2 Small Game and Furbearers

Small game species in Wyoming include cottontail rabbits (*Sylvilagus* spp.), snowshoe hare (*Lepus americanus*), and the red squirrel (*Tamiasciurus hudsonicus*). Desert and mountain (Nuttall's) cottontails (*S. audubonii* and *S. nuttallii*, respectively) are likely to inhabit the Rail Facility Site. Snowshoe hares and red squirrel are found within Wyoming mountain ranges but would not likely occur within the Rail Facility Site.

Wyoming permits the trapping of eleven (11) furbearing species by license holders including: badger (*Taxidea taxus*), bobcat (*Lynx rufus*), marten (*Martes americana*), multiple weasel species (*Mustela frenata, Mustela nigripes, Mustela mivalis, Mustela erminea*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), multiple skunk species (*Spilogale gracilis, Spilogale putorius, Mephitis mephitis*), beaver (*Castor canadensis*), mink (*Mustela vison*), and muskrat (*Ondatra zibethicus*). Coyote, raccoon, red fox, and skunk are classified as predator species and may be taken without a license. Badger, bobcat, all weasel species, beaver, and muskrat may be taken if damage is being caused. Mink, beaver, and muskrat may occur in the Sugar Creek drainage crossed by the Rail Facility running track. Badger, bobcat, long-tailed weasel, coyote, red fox, and striped skunk all have distributions that include the Rail Facility Site.

8.8.3 Migratory and Breeding Bird Species

The habitats within the Rail Facility Site are similar to those found elsewhere within the CCSM Project. Based on habitat characteristics of the area and observations made by survey crews,

species occurrences of migratory and breeding birds within the Rail Facility Site are expected to be similar to that seen across the remainder of the CCSM Project Site. The Rail Facility Site is used by a number of avian species. Avian species use in the area is informed by observations of survey crews as well as data collection efforts in similar habitats across the CCSM Project Site, as discussed in the Rail Facility Avian Resource Report (Appendix M). Data collection efforts in the CCSM Project for migratory birds and raptors include a combination of a DeTect Avian Radar System, long-watch raptor surveys, raptor nest surveys, migratory bird point count surveys, waterbird surveys, and breeding bird grid density surveys.

A total of 295 migratory bird surveys were performed from April 4, 2011 through March 27, 2012 throughout the CCSM Project Site. Point count locations were each surveyed 16 to 23 times, with the variation in number of surveys due to accessibility issues and inclement weather postponing or cancelling surveys. Breeding bird density surveys were completed at 15 locations across the CCSM Project Site. Grid surveys were conducted following the survey protocols published by the Rocky Mountain Bird Observatory (Hanni et al. 2009).

Horned lark (*Eremophila alpestris*) dominated the number of observations, accounting for 62 percent of all individual observed. Horned lark was also the most frequently encountered species on surveys, with the species recorded for 100 percent of grid surveys. The next most abundant species on surveys were Brewer's sparrow (*Spizella breweri*) and vesper sparrow (*Pooecetes gramineus*). Due to the habitat characteristics within the Rail Facility Site, species such as the horned lark associated with salt desert shrub will be the most common species to use the area.

8.8.4 Fisheries

Sugar Creek is the only named stream within the Rail Facility Site. Sugar Creek is a perennial stream that drains into the North Platte River approximately five (5) miles northeast of the Town of Sinclair. Fish habitat is related to the hydrologic conditions of the riparian area and uplands associated with, or contributing to stream channel characteristics. The Rawlins wastewater treatment facility discharges into Sugar Creek, but the stream rarely flows all the way to its confluence with the North Platte River. The WGFD classifies Sugar Creek as Clear (no trout or other important game fish are present) (WGFD 2013).

8.9 Special Status Species

Special status species (SSS) include wildlife species under the jurisdiction of WGFD, species designated as *Wyoming's Species of Greatest Conservation Need* (WGFD 2010), those listed as sensitive by the BLM, and those federally protected under the Endangered Species Act (ESA) (BLM 2012a). These SSS include terrestrial and aquatic animals and plants. As part of the consultation process with the USFWS completed for the EIS, a biological assessment was prepared and submitted to the USFWS, and a corresponding BO was included with the ROD issued in October 2012 (BLM 2012b).

SWCA conducted wildlife and SSS surveys of the Rail Facility Site in accordance with the Wildlife Monitoring and Protection Plan for the CCSM Project (Appendix G in BLM 2012b) and survey results are presented in the Rail Facility Wildlife Survey Report (Appendix N) and Rare Plant Survey Report (Appendix O). Wildlife surveys focused on the potential occurrence of SSS and habitat assessments for SSS identified in the wildlife monitoring and protection plan.

8.9.1 Avian Species

PCW has collected detailed data on avian use of the CCSM Project Site, including the Rail Facility Site, through diurnal point count surveys and other monitoring protocols (Appendix M). PCW has also collected data relating to the use of the CCSM Project by greater sage-grouse since 2009.

8.9.1.1 Sagebrush obligates

Sagebrush habitats occur throughout portions of the Rail Facility Site. These habitats provide suitable nesting and foraging locations for sagebrush obligates (sage thrasher, sagebrush sparrow, Brewer's sparrow). One sage thrasher was observed during surveys of the Rail Facility Site in 2013.

8.9.1.2 Mountain Plover

Potentially suitable habitats occur throughout most of the Rail Facility Site. These habitats may provide suitable nesting and foraging locations for mountain plover. No mountain plovers were identified in the survey corridor associated with the Rail Facility Site, although one incidental observation of a plover occurred 100 to 200 meters south of the laydown yards in the utility corridor.

8.9.1.3 Western burrowing owl

No burrowing owls were observed within the Rail Facility Site. However, several white-tailed prairie dog locations and other potentially suitable burrows were observed during surveys of the Rail Facility Site (Appendix N).

8.9.1.4 Greater Sage-Grouse

PCW has collected high-resolution data on greater sage-grouse across the CCSM Project and adjacent lands since 2010. During that period, more than 200 greater sage-grouse have been fitted with GPS transmitters and more than 250,000 greater sage-grouse locations have been recorded. No data points have ever been recorded in the vicinity of the Rail Facility Site and no observation of greater sage-grouse were made during wildlife survey efforts. The area does not provide suitable contiguous sagebrush habitat for greater sage-grouse.

8.9.2 Raptors

No raptor nests have been found within the Rail Facility Site. The lack of nesting substrate and relatively flat topography suggests that the Rail Facility Site has very low potential for nesting

SSS raptor species (e.g., ferruginous hawk, golden eagle) although the area could be used for foraging or other activities.

8.9.3 Small Game and Furbearers

8.9.3.1 White-tailed Prairie Dog

Three (3) white-tailed prairie dog colonies, two active and one inactive, were found during surveys within the Rail Facility Site (Appendix N). The inactive colony was located along the lead track (Track B) of the Rail Facility Site as the tracks run south from the existing UPPR railroad. At the inactive colony, mound conditions were old and weather worn, and the majority of burrows were collapsed and or shut-in. No sign of white-tailed prairie dog activity (e.g., scraping, scat, etc.) was present near or surrounding mounds and burrows. The active colonies were located along the northern edge of the rail loop.

8.9.3.2 Pygmy Rabbit

Pygmy rabbits were not observed during surveys within the Rail Facility Site. Vegetation communities in the survey area typically consist of black greasewood (*Sarcobatus vermiculatus*) assemblages and barren landscapes and do not provide suitable habitat for pygmy rabbit.

8.9.3.3 Wyoming Pocket Gopher

Two sites containing pocket gopher activity was observed during surveys of the Rail Facility Site (Appendix N). The Keinath and Griscom model (WYNDD 2010) was used to determine the most likely species for the locations. Results of the model indicate that the species at theselocations are unknown. Dominant vegetation communities in the Rail Facility survey area typically consist of black greasewood (*Sarcobatus vermiculatus*) assemblages and barren landscapes and the majority of the Rail Facility survey area does not provide suitable habitat for pocket gopher.

8.9.4 Amphibians and Reptiles

Amphibian and reptile monitoring for the Rail Facility Site was accomplished through opportunistic wildlife observations while performing other wildlife surveys. Neither northern leopard frog nor Great Basin spadefoot toad have been found within the Rail Facility Site. Habitat is very limited for the northern leopard frog within the Rail Facility Site and only occurs along the wetted portions of Sugar Creek.

8.9.5 Rare Plants

8.9.5.1 ESA Listed Plants

Carbon County does not contain ESA critical habitat for any plant species (USFWS 2008); however, the Rail Facility Site may potentially provide non-critical habitat for two (2) federally

listed threatened plant species, the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) and Colorado butterfly plant (*Gaura neomexicana* spp. *coloradensis*).

Efforts to locate these two (2) plant species within a portion of the CCSM Project Site were conducted during 2008 (WEST 2008a, 2008b) and as part of vegetation surveys completed during PCW's detailed vegetation mapping efforts. In 2012, a wetland delineation was completed, and no ESA listed plants or suitable habitats were located (ERO 2013). Additional surveys were conducted in 2013 and no species occurrences were located and no suitable habitat identified.

8.9.5.2 BLM Sensitive Species

A review of BLM and WYNDD plant records identify that only persistent sepal yellowcress (*Rorippa calycina*) has been documented within the immediate vicinity of the CCSM Project Site. Surveys within the Rail Facility Site for sensitive species plants were completed in 2012 and 2013, and no BLM sensitive species plants were located (Appendix O).

8.10 Cultural Resources

A Class I file search and a Class III cultural resource inventory were completed for the Rail Facility in 2012 and 2013. The purpose of the file search and inventory was to identify and assess the cultural resources that occur within the Rail Facility Class III inventory area.

The Class I review, which was conducted through the Wyoming Cultural Resources Office and BLM RFO, identified all previously conducted cultural resources investigations and previously recorded cultural resources within a 1-mile buffer surrounding the Rail Facility. There have been a total of 33 cultural resources investigations previously conducted in the files search study area (Baer et al. 2013). These previous cultural resource investigations identified a total of 31 cultural sites in the search area. Of these sites, 6 are located within the Rail Facility Class III cultural resource inventory area. Of the 6 sites four are located in the final alignment; 3 are not eligible for inclusion on the NRHP, and 1 is currently unevaluated for NRHP nomination (subsequent Class III surveys for the Rail Facility determined that this site was not eligible for NRHP nomination). The 4 sites that were previously recorded and that fall within the final alignment include:

- 2 prehistoric sites,
- 2 historic sites.

The Class III inventory of the Rail Facility was completed in 2012 and 2013. Results of the Rail Facility Class III inventory have been documented in a technical report submitted to BLM and Wyoming State Historic Preservation Office (SHPO) for review and concurrence (Baer et al. 2013). During the Class III inventory SWCA revisited six previously recorded sites (48CR645, 48CR646, 48CR3869, 48CR4429, 48CR6213, and 48CR8241), and recorded six new sites (48CR10053, 48CR10054, 48CR10055, 48CR10056, 48CR10057, and48CR10105) and nine new

isolated resources. A total of 7 of those sites lie on the final alignment. Of these, two sites (48CR10056 and 48CR10105) are recommended eligible for National Register of Historic Places (NRHP) nomination.

The Rail Facility will result in no adverse effects to historic properties. Sites 48CR10056 and 48CR10105 have been recommended eligible for nomination to the NRHP. Extensive shovel testing within the construction corridor revealed no subsurface cultural material in either site. Areas of the eligible sites falling within the construction corridor were recommended as non-contributing portions of the sites. Archaeological monitoring and fencing of the eligible portions of the sites through the construction corridor will be used to ensure that no intact cultural material is located during mechanical excavation of the Rail Facility and that contributing portions of the site are not disturbed. Otherwise, the Class III inventory report recommends that the Rail Facility construction proceed without further on-site work in relation to Section 106 compliance.

Avoidance and minimization measures for cultural resources have been incorporated into the CCSM Project as described in Appendix A. Where avoidance is not possible, sites will be mitigated in accordance with the CCSM Project Programmatic Agreement (PA) for cultural resources (BLM 2012b). Unexpected discoveries of cultural resources during construction will be handled in accordance with the CCSM Project PA.

8.11 Paleontological Resources

The probability of finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. The potential fossil yield classification (PFYC) system is a method of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically important fossils (plants and invertebrates) and their sensitivity to adverse impacts (BLM 2009). Geologic mapping in conjunction with the PFYC system can be used for assessing the potential for the occurrence of paleontological resources.

The geologic units underlying the Rail Facility Site include Quaternary alluvium (PFYC of 3), Miocene rocks (PFYC of 2), Steele Shale and Niobrara formations (PFYC of 3 and 5, respectively), and small amounts of the Frontier formation (PFYC of 3). Geotechnical testing occurred at 33 locations within the Rail Facility Site. Results of the borings indicate that the majority of the Rail Facility Site is underlain by deep alluvial soils. The Steele Shale was the only formation that was encountered during the boring. Steele Shale was encountered at depths of 20-25 ft below the exiting ground surface in Township 21 North, Range 87 West, Section 25 and in Township 21 North, Range 86 West, Section 31 (one location on the edge of a slope encountered the Steele Shale at 12 ft below existing ground surface). Because of these depths, disturbance of the Steele Shale formation during construction is not anticipated.

A pedestrian paleontological assessment of Class 5 and associated Class 3 areas on federal lands in the Rail Facility Site was completed and found little potential for fossil resources. No

fossils were located during pedestrian surveys of the Rail Facility Site; however, fossil localities have been identified within the CCSM Project Area near the southern boundary of the Rail Facility Site in association with the Overland Pass Pipeline (Uinta Paleontological Associates, Inc. 2006).

There is a possibility for exposure of potential fossil bearing formations on steep slopes generally greater than 25 percent. The majority of the Rail Facility Site is relatively level with the exception of a few small hills with slopes in excess of 25 percent along the edges of the Grenville Dome and in the southeastern portion of the Rail Facility Site. PCW has committed to avoid or minimize any surface disturbing activities on slopes greater than 25 percent to avoid potential effects paleontological resources. This measure will reduce the likelihood of disturbance to potential fossil bearing formations where they are exposed or just below the ground surface.

8.12 Visual Resources

Visual resources on federal lands within the Rail Facility Site are managed as Visual Resource Management (VRM) Class IV; which provides for management activities that may result in major modifications to the existing character of the landscape with a high level of change. The Rail Facility is located in an industrialized corridor containing the cities of Rawlins and Sinclair, the Wyoming State penitentiary, Interstate 80, the UPRR, numerous natural gas pipelines and associated infrastructure, and the Sinclair refinery. Much of the Rail Facility will be hidden from view behind the Grenville dome and other topographic features. The Rail Facility will create new linear, ground-level disturbances consistent with other lines and features in this industrialized corridor. The rail lines will occur in a corridor immediately adjacent to existing rail that residents and travelers on area roadways are already accustomed to.

8.13 Waste

Waste from the construction, operations, maintenance, and decommissioning of the Rail Facility will be handled in accordance with the CCSM Project Waste Management Plan (Appendix P). The Rail Facility is expected to generate up to 19 tons of waste during construction and negligible amounts during O&M. Waste estimates for decommissioning of the Rail Facility will be developed in the decommissioning plan when recycling options are identified. Waste materials generated by the Rail Facility will include municipal solid waste (trash or general supervision waste), construction debris (e.g. soil, concrete, pallets, packaging, etc.) and sanitary waste. Small amounts of used oil, waste oil, oil-contaminated materials, and hazardous waste may also be generated. Used oil, waste oil, and oil-contaminated materials will be handled in accordance with the requirements of the Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) (Appendix Q). Hazardous materials will be managed in accordance with the requirements of the hazardous material management portion of the Health and Safety Plan (section 9 and Appendix R). All sanitary waste will be handled by a licensed sanitary waste vendor.

Materials will be reused or recycled when feasible. Steel from the rail and anchor plates, wooden ties, and ballast can generally be recycled or reused. For material that cannot be reused or recycled, PCW will store the waste at designated locations in accordance with the Waste Management Plan, SPCC Plan (as applicable), Health and Safety Plan (as applicable), and all other applicable rules and regulations until it is collected for transport to an approved disposal facility by a licensed hauler. Wastes will be segregated by type, and materials that will be recycled will be stored separately.

All materials and debris associated with the Rail Facility will be removed and properly recycled or disposed of at offsite facilities; waste will not be disposed of onsite.

9. Health and Safety

PCW will implement a health and safety program at the Rail Facility in accordance with the Health and Safety Plan (Appendix R) and all applicable rules and regulations. The Health and Safety Plan developed by PCW applies to all stages of the CCSM Project, i.e. development, construction, operations, maintenance, and decommissioning and applies to all PCW employees working on the CCSM Project Site.

PCW also requires that the general contractor or operating entity for the CCSM Project provide a site safety policy and site health and safety plan that will be applicable to all work within the CCSM Project Site. All personnel on the CCSM Project Site (general contractor, subcontractor, vendor, PCW, and BLM) must adhere to the site health and safety plan. The site health and safety plan will, at a minimum, address the following topics:

- Site Evaluation and Pre-Work Planning
- Blasting
- Electrical safety (including lock out/tag out)
- Fire prevention
- Public access control and interaction (including work in areas with public access)
- Drug and alcohol policy and testing
- Weapons policy and hunting restrictions
- Onsite speed limits
- Fall protection
- Suspended loads
- Wildlife and livestock interactions
- Emergency response plan
- Security
- Required levels of Personal Protective Equipment (PPE)
- Severe weather
- Work permits and notifications
- Night work
- Safety briefing requirements
- Hazardous materials
- Training

In addition to adhering to the site health and safety plan, all contractors and entities working on the CCSM Project are responsible for developing a health and safety plan that is specific to their particular scope of work and that meets all applicable legal and regulatory requirements.

In addition to the Health and Safety Plan, PCW has also prepared for the possibility of fuel and oil spills from the Rail Facility with a SPCC Plan (Appendix Q). The SPCC Plan describes measures to avoid, minimize, and mitigate potential oil spills. This plan establishes emergency response procedures, lines of communications, and responsibilities. Although hazardous spills are not anticipated during project activities, the SPCC Plan provides the protocols and control measures that will be implemented in the event of a spill.

10. References

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APPENDIX A

Chokecherry and Sierra Madre Wind Energy Project
Environmental Constraints and Measures

West Sinclair Rail Facility

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August 2013

(Updated March 2014)

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Cultural – Historic Trails	Within either 0.25-mile or the visual horizon (whichever is closer) of a cultural property/ historic trails.	No surface disturbing activities. Management actions resulting in visual elements that diminish the integrity of the property's setting will be managed in accordance with the Wyoming State Protocol and BMPs.	Yes[4]	Yes	Yes	1	2008 Rawlins RMP ROD; Wyoming BLM Mitigation Guidelines; Wind Energy Programmatic EIS ROD Policies and BMPs.	The Rail Facility will not result in adverse effects to historic properties. PCW will follow the stipulations of the PA regarding the treatment of historic properties, including mitigation of adverse effects.
Recreation Sites	Within 0.25-mile of developed and undeveloped recreation sites.	Lands closed to operation of public land laws.	Yes[4]	Yes[4]	Yes[4]	1	2008 Rawlins RMP ROD.	There are no developed or undeveloped recreation sites within 0.25 mile of the Rail Facility Site.
Soils – Slopes	Steep slopes >25 percent.	Surface disturbance will be prohibited. No turbines, staging or substations.	Yes[5]	Yes[5]	Yes[5]	1	Wyoming BLM Mitigation Guidelines.	The Rail Facility is not located on slopes of 25 percent or greater.
Special Management Areas – Designated Areas	Designated areas part of the National Landscape Conservation System (e.g., Continental Divide National Scenic Trail [CDNST]).	Lands will be excluded from wind energy site monitoring and testing and development on lands on which wind energy development is incompatible with specific resource values. (0.25-mile swath centered on the trail)	n/a	Yes[4]	Yes	1	Wind Energy Programmatic EIS ROD Policies and BMPs.	The Rail Facility is not located within 0.25 mile of areas designated as part of the National Landscape Conservation System.
Water – Ephemeral Channels	Within 100 feet from the inner gorge of ephemeral channels.	Avoidance areas for surface-disturbing and disruptive activities and linear crossings. Only those actions within areas that cannot be avoided and that provide protection for the resource identified will be approved.	No[5]	No[5]	Yes[5]	1	2008 Rawlins RMP ROD.	Surface disturbance within 100 feet from the inner gorge of ephemeral channels has been avoided on federal lands to the extent practicable for the Rail Facility. Erosion control measures will be in put place in accordance with the Erosion Control Plan and SWPP Plan.
Water – Floodplains	Identified 100-year floodplains.	Surface disturbing activities will be avoided. Only those actions within areas that cannot be avoided and that provide protection for the resource identified will be approved.	No	No	Yes	1	2008 Rawlins RMP ROD.	All components of the Rail Facility Site are located outside the 100-year floodplain on federal lands, with the exception of the North Platte Pump Station and River Road which must be within the floodplain to reach the North Platte River. Erosion control measures will be in put place in accordance with the Erosion Control Plan and SWPP Plan.
Water – Perennial Waters, Springs, Wetlands, Riparian	Within 500 feet of perennial waters, springs, and wetland and riparian areas.	Surface disturbing activities will be avoided. Only those actions within areas that cannot be avoided and that provide protection for the resource identified will be approved.	No[4,5]	No[4,5]	Yes[5]	1	2008 Rawlins RMP ROD; Wyoming BLM Mitigation Guidelines; Executive Orders (EOs) 11990 and 11988.	Surface disturbing activities for the Rail Facility within 500 feet of perennial waters, springs, and wetland and riparian areas on federal lands have been avoided to the extent practicable. Erosion control measures will be in put place in accordance with the Erosion Control Plan and SWPP Plan.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Water – Unstable Areas	Unstable areas (such as landslides, slopes >25 percent, slumps, and areas exhibiting soil creep).	Surface disturbing activities will be avoided. Reclamation practices and BMPs will be applied as appropriate for surface disturbing activities.	No	No	Yes	1	2008 Rawlins RMP ROD.	Surface disturbing activities for the Rail Facility on identified unstable areas on federal lands have been avoided to the extent practicable. Stabilization measures have been applied in accordance with the CCSM Project Road Design Manual (Appendix C).
Water – Wetlands	Wetlands identified on National Wetlands Inventory (NWI) or proper functioning condition (PFC).[6]	No disturbance.	No	No	Yes	1	EOs 11990 and 11988.	The Rail Facility has been designed to avoid disturbance to wetlands identified on NWI or PFC on federal lands.
Wildlife – Amphibians	Identified 100-year floodplains; within 500 feet of perennial waters, springs, wells, and wetlands; and within 100 feet of the inner gorge of ephemeral channels.	Surface disturbing and disruptive activities will be avoided.	No	No	Yes	1	2008 Rawlins RMP ROD.	Surface disturbance and disruptive activities for the Rail Facility on federal lands have been avoided to the extent practicable within (1) identified 100-year floodplain; (2) 500 feet of perennial waters, springs, wells, and wetlands; and (3) 100 feet of the inner gorge of ephemeral channels.
Wildlife – Fish	Waterbodies that potentially support fish for a portion of the year.	Design road crossings to simulate natural stream processes.	No	No	Yes	1	2008 Rawlins RMP ROD.	Road crossings on federal lands of waterbodies that potentially support fish for a portion of the year have been designed to simulate natural stream processes, as described in the Rail Facility (Appendix B).
Wildlife – Raptors	825 feet of active raptor nests (ferruginous hawks, 1,200 feet).	Well locations, roads, ancillary facilities, and other surface structures requiring a repeated human presence will not be allowed. Distance may vary depending on factors such as nest activity, species, natural topographic barriers, and line-of-sight distances.	Yes	Yes	Yes	1	2008 Rawlins RMP ROD.	As discussed in section 8.8.2 of the Rail Facility Site-specific Plan of Development, PCW will request exceptions to this spatial stipulation from BLM based on factors such as nest activity, species, natural topographic barriers, and line-of-sight distances.
Wildlife-Columbian Sharp-tailed Grouse	0.25 mile to 1 mile of an occupied or undetermined Columbian sharp-tailed grouse lek.	High-profile structures (e.g., buildings, storage tanks, overhead powerlines, wind turbines, towers, and windmills) would be authorized on a case-by-case basis from one-quarter mile to 1 mile of an occupied greater sage-grouse and sharp-tailed grouse lek.	No	No	Yes	1	2008 Rawlins RMP ROD.	No known active or inactive Columbian sharp-tailed grouse leks are within one mile of the Rail Facility Site.
Wildlife – Greater Sage-grouse	Inside Core Areas: 0.60 mile NSU from lek perimeter (includes occupied and undetermined leks).	Surface disturbing activities or surface occupancy is prohibited or restricted.	Yes	Yes	Yes	1	BLM IM No. WY-2012-019	The Rail Facility Site is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3). No known active or inactive greater sage-grouse leks are within 0.25 mile of the Rail Facility Site.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
	Outside Core Areas: 0.25 mile NSU from lek perimeter (includes occupied and undetermined leks).							
Wildlife – Greater Sage-grouse	Inside Core Areas.	Limit development to one disturbance location per 640 acres. Cumulative value of one location and existing disturbance to not exceed 5 percent of sagebrush habitat within 640 acres	No	No	Yes	1	BLM IM No. WY-2012-019	The Rail Facility Site is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3).
Wildlife – Greater Sage-Grouse	0.25-mile to 1 mile of an occupied sage-grouse lek.	High-profile structures (e.g., buildings, storage tanks, overhead power lines, wind turbines, towers, and windmills) will be authorized on a case-by-case basis.	No	No	Yes	1	2008 Rawlins RMP ROD.	No high-profile structures associated with the Rail Facility are within one mile of any known active or inactive greater sage-grouse leks.
Wildlife – Greater Sage-grouse	Inside Core Areas: Within 0.60-mile of the perimeter of an occupied or undetermined greater sage-grouse lek. Outside Core Areas: Within 0.25-mile of the perimeter of an occupied or undetermined greater sage-grouse lek.	Disruptive activities are restricted between 6:00 p.m. and 9:00 a.m. from March 1 to May 20.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD; BLM IM No. WY-2012-019.	The Rail Facility is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3). No known active or inactive greater sage-grouse leks are within 0.25 mile of the Rail Facility Site.
Wildlife – Greater Sage-grouse	Inside Core Areas: In suitable greater sage-grouse nesting and early brood-rearing habitat. Outside Core Areas: In suitable greater sage-grouse nesting and early brood-rearing habitat within 1) mapped habitat important for connectivity, or 2) within 2 miles of any occupied or undetermined lek.	Surface disturbing and/or disruptive activities are prohibited or restricted from March 1 – July 15.	No[7]	No[7]	Yes	2	BLM IM No. WY-2012-019; 2008 Rawlins RMP ROD.	The Rail Facility is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3). PCW will not perform surface disturbing activities and/or disrupting activities on federal lands within the Rail Facility Site between March 1 and July 15 in suitable greater sage-grouse nesting and early brood-rearing habitat within 1) mapped habitat important for connectivity, or 2) within two miles of any occupied or undetermined lek unless an exception is authorized by BLM.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Wildlife – Greater Sage-grouse	Greater sage-grouse delineated winter concentration areas.	Surface disturbing and/or disruptive activities in mapped or modeled greater sage-grouse winter habitats/concentration areas that support Core Area populations, are prohibited or restricted from November 15 – March 14.	No[7]	No[7]	Yes	2	BLM IM No. WY-2012-019; 2008 Rawlins RMP ROD.	The Rail Facility Site is not within greater sage-grouse delineated winter concentration areas, including mapped or modeled winter habitats/concentration areas that support core area populations.
Wildlife – Columbian Sharp-tailed Grouse	Within 0.25-mile of the perimeter of an occupied or undetermined Columbian sharp-tailed grouse lek.	Surface disturbing activities or occupancy are prohibited. Disruptive activities are prohibited between 6:00 p.m. and 9:00 a.m. from March 1 to May 20.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known active or inactive Columbian sharp-tailed grouse leks are located within 0.25 mile of the Rail Facility Site.
Wildlife – Barn Owl	Within 0.75-mile of barn owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited February 1–July 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known barn owl nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Big Game	Big game crucial winter range.	Surface disturbing and disruptive activities will not be allowed during the period of November 15 to April 30. Disruptive activities will require the use of BMPs designed to reduce the amount of human presence and activity during the winter months.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD; Wyoming BLM Mitigation Guidelines.	The Rail Facility Site includes crucial winter range for mule deer. Surface disturbing and disruptive activities will not occur in mule deer crucial winter range on federal lands between November 15 and April 30 unless an exception is authorized by BLM.
Wildlife – Big Game	Big game parturition areas.	Surface disturbing and disruptive activities will not be allowed during the period of May 1 to June 30.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD; Wyoming BLM Mitigation Guidelines.	No big game parturition areas are present within the Rail Facility Site.
Wildlife – Burrowing Owl	Within 0.75-mile of burrowing owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 15–September 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	Wildlife surveys have been completed for the Rail Facility Site (Appendix N). The Rail Facility Site contains potential burrowing owl nesting habitat associated with white-tailed prairie dog colonies. Pre-construction presence/absence surveys will be conducted in suitable habitat for portions of the Rail Facility constructed during the burrowing owl nesting period. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Cooper's Hawk	Within 0.75-mile of Cooper's hawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known Cooper's hawk nests are located within 0.75 mile of the Rail Facility Site.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Wildlife – Ferruginous Hawk	Within 1-mile buffer of ferruginous hawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited March 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	Ferruginous Hawk nests on federal lands within one mile of surface disturbing and disruptive activities associated with the Rail Facility will be monitored to determine activity in the season prior to construction. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Golden Eagle	Within 1-mile buffer of golden eagle nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited February 1–July 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	Golden Eagle nests on federal lands within one mile of surface disturbing and disruptive activities associated with the Rail Facility will be monitored to determine activity in the season prior to construction. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Goshawk	Within 0.75-mile of Goshawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–August 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known Goshawk nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Great-Horned Owl	Within 0.75-mile of great-horned owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited February 1–July 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known great-horned owl nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Kestrel	Within 0.75-mile of kestrel nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known kestrel nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Long-Eared Owl	Within 0.75-mile of long-eared owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited March 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known long-eared owl nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Merlin	Within 0.75-mile of Merlin nests.	Seasonal wildlife stipulation April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known Merlin nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Mountain Plover	Potential and occupied habitat Mountain plover.	Habitat will be avoided where practical. All surface-disturbing activities will be restricted from April 10 to July 10. Additional protection measures will be applied if this area is later determined to be within occupied habitat. Occupied habitat is defined as areas where broods and adults have been found.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	Wildlife surveys have been completed for the Rail Facility (Appendix N). The Rail Facility contains potential mountain plover habitat. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Northern Harrier	Within 0.75-mile of northern harrier nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known northern harrier nests are located within 0.75 mile of the Rail Facility Site.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Wildlife – Osprey	Within 0.75-mile of osprey nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known osprey nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Peregrine Falcon	Within 0.75-mile of peregrine falcon nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited March 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known peregrine falcon nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Prairie Falcon	Within 0.75-mile of prairie falcon nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	Prairie falcon nests on federal lands within 0.75 mile of surface disturbing and disruptive activities associated with the Rail Facility will be monitored to determine activity in the season prior to construction. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Raptor	Defined raptor and game bird winter concentration areas.	Activities or surface use will not be allowed from November 15 to April 30.	No[7]	No[7]	Yes	2	Wyoming BLM Mitigation Guidelines.	No defined raptor or game bird concentration areas are located within the Rail Facility Site.
Wildlife – Raptor	Raptor nesting habitat.	Activities or surface use will not be allowed from February 1 to July 31.	No[7]	No[7]	Yes	2	Wyoming BLM Mitigation Guidelines.	Raptor nesting habitat on federal lands within the Rail Facility Site will be monitored for nesting activity prior to construction. PCW will comply with the stipulations as described in this table (Table 1; ROD Table D-1) or request an exception from BLM.
Wildlife – Raptors	Within 0.75-mile of other raptor nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited February 1–July 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known nests for 'other' raptors not addressed by individual timing stipulations are located within 0.75 mile of the Rail Facility Site.
Wildlife – Red-Tailed Hawk	Within 0.75-mile of red-tailed hawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited February 1–July 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known red-tailed hawk nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Screech Owl	Within 0.75-mile of screech owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited March 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known screech owl nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Sharp-Shinned Hawk	Within 0.75-mile of sharp-shinned hawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known sharp-shinned hawk nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Short-Eared Owl	Within 0.75-mile of short-eared owl nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited March 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known short-eared owl nests are located within 0.75 mile of the Rail Facility Site.

TABLE 1. SUMMARY OF BLM ENVIRONMENTAL CONSTRAINTS (ROD TABLE D-1)

Resource Area	Resource Concern	Protection Measure	Application to Jurisdiction[1]			Mitigation Type[2]	Authority/Source	Implementation
			Private Land[3]	State Land	Public Land			
Wildlife – Swainson's Hawk	Within 0.75-mile of Swainson's hawk nests.	Surface disturbing and disruptive activities potentially disruptive are prohibited April 1–July 31.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known Swainson's hawk nests are located within 0.75 mile of the Rail Facility Site.
Wildlife – Western Yellow-billed Cuckoo	Within 0.5 mile radius yellow-billed cuckoo nest.	Seasonal wildlife stipulation April 15–August 15.	No[7]	No[7]	Yes	2	2008 Rawlins RMP ROD.	No known yellow-billed cuckoo nests are located within 0.5 mile of the Rail Facility Site.

Notes:

[1] Sources of information for application of stipulations for private and state lands include *Applicant Proposed Alternative and BLM Response Letter* (April 23, 2010), *PCW Response and Data on BLM Alternatives* (December 2009), and the *Plan of Development for the Chokecherry and Sierra Madre Wind Energy Project* (January 12, 2012).

[2] 1 = Restriction; 2 = Seasonal.

[3] As indicated in PCW's submittal entitled *Applicant Proposed Alternative and BLM Response Letter* (April 23, 2010).

[4] Applicant imposes more restrictive measures or applies measure to a specific area, see summary table of PCW ACMs.

[5] Per the *PCW Response and Data on BLM Alternatives* (December 2009) footnotes to Alternatives Summaries #18, "No Surface Uses (NSUs), as provided by BLM, were avoided to the extent practicable; however, some NSUs could not be completely avoided in a small number of discreet instances (mainly ephemeral streams, slope, and perennial streams/springs/wetlands/riparian). An example of an exception to the NSUs is where a turbine is located in an area that cannot be accessed without crossing an ephemeral stream. If it is determined that the stream is a Water of the U.S., then a Section 404 permit will be obtained thereby allowing an access road to be constructed. Another example is the slope criteria. The accuracy of the digital terrain model used for this analysis is insufficient for micro-siting. Engineering judgment was used to determine in a limited number of cases that it may be possible to grade a resource road to design criteria."

[6] See Chapter 8.0, Glossary.

[7] Per the *PCW Response and Data on BLM Alternatives* (December 2009) footnotes to Alternatives Summaries #10, "seasonal timing restrictions were not applied to construction activities on private land."

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-01	ESA, sensitive species, and other wildlife and fish species	Site-specific surveys and/or monitoring for ESA threatened and endangered species, BLM sensitive species and other wildlife and fish species will take place during each phase of construction. Survey and monitoring approaches will be developed in coordination with USFWS, BLM, and WGFD and will be identified in the site-specific PODs developed for each construction right-of-way grant.	PCW has coordinated with BLM to implement the Wildlife Monitoring and Protection Plan included in the CCSM Project ROD. Survey and monitoring activities will continue during construction in accordance with the Wildlife Monitoring and Protection Plan.
A-1-02	Avian and Bat Species, Golden and Bald Eagles	PCW will develop an Avian Protection Plan (APP), a Bat Protection Plan (BPP) and an Eagle Conservation Strategy (ECS) to identify measures to avoid, minimize, and mitigate project impacts through siting, operations, and monitoring.	An APP, BPP and ECS are not required for the Rail Facility. An APP, BPP, and ECS will be developed for the wind turbine site-specific plans of development.
A-1-03	Greater Sage-grouse	PCW will comply with EO 2011-5 and commit to no construction activities within Wyoming's SGCA as they are identified in EO 2011-5 (Core Area Version 3 Map).	The Rail Facility is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3).
A-1-04	Wildlife Habitat Management Areas	PCW will not construct any facilities within portions of the Red Rim-Grizzly WHMA and Upper Muddy Creek Watershed-Grizzly WHMA that are within the Wyoming Sage-Grouse Core Management Area Version 3 Map (EO 2011-5).	The Rail Facility are located outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3).
A-1-05	Mule Deer	PCW will continue to coordinate with WGFD on ongoing mule deer monitoring efforts on the Ranch.	PCW continues to coordinate with WGFD on ongoing mule deer monitoring efforts on the Ranch.

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-06	Colorado River Fishes – bluehead sucker, flannelmouth sucker, roundtail chub, Colorado River cutthroat trout	PCW will continue to work with WGFD and BLM to develop conservation and monitoring strategies for native fish species in the Upper Muddy Creek watershed.	PCW continues to work with WGFD and BLM to develop conservation and monitoring strategies for native fish species in the Upper Muddy Creek watershed.
A-1-07	Fish species, amphibian species, other stream obligates; water quality	PCW will monitor watershed and stream conditions throughout the Application Area to document hydrologic conditions and stream channel characteristics (see Appendix F – Watershed Monitoring Plan).	PCW is monitoring watershed and stream conditions as described in the Watershed Monitoring Plan for the CCSM Project.
A-1-08	Other wildlife species	PCW will continue to incorporate the outcome of site-specific surveys to microsite infrastructure in order to avoid, minimize, or mitigate impacts to wildlife species.	Surveys of the Rail Facility Site were used to microsite the infrastructure to avoid, minimize and mitigate impacts to wildlife species.
A-1-09	Wildlife Stipulations	PCW will adhere to the timing and spatial stipulations and exception processes as they are described in the Project ROD.	The Rail Facility design and schedule reflects the timing and spatial stipulations identified in the ROD; to the extent that exceptions are required, PCW will follow the exception/variance process described in the ROD.
A-1-10	Wildlife Stipulations	Timing and spatial stipulations will be used on public lands.	The Rail Facility design and schedule reflects the use of the timing and spatial stipulations identified in the ROD on federal lands.
A-1-11	Avian and Bat Monitoring	PCW will develop a project Avian Protection Plan, Bat Protection Plan and Eagle Conservation Strategy that will each describe post-construction monitoring efforts for avian and bat species.	Pursuant to the Record of Decision, an APP, BPP, and ECS are not required for the Rail Facility. In conformance with the ROD, an APP, BPP, and ECS will be developed for the wind turbine site-specific plans of development.

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-12	Wildlife Monitoring and Survey	PCW will continue to incorporate the outcome of site-specific surveys to microsite infrastructure in order to avoid, minimize, or mitigate impacts to sensitive wildlife species.	Surveys of the Rail Facility Site were used to microsite the infrastructure to avoid, minimize and mitigate impacts to sensitive wildlife species.
A-1-13	Vegetation	Vegetation datasets developed by PCW will be used during project design to identify sensitive vegetation types for avoidance, minimization or mitigation and to optimize the reclamation plans for each construction phase.	PCW has used its vegetation datasets to avoid and minimize impacts to sensitive vegetation within the Rail Facility Site. The Reclamation Plan for the Rail Facility identifies appropriate BMPs to minimize and mitigate remaining impacts.
A-1-14	Colorado butterfly plant and Ute ladies'-tresses orchid	Site-specific surveys for both plant species will be completed prior to surface disturbing activities in suitable habitat.	Surveys of the Rail Facility Site were completed and no suitable habitat for Colorado butterfly plant or Ute ladies'-tresses orchid was identified.
A-1-15	Revegetation and Reclamation	PCW will develop detailed reclamation plans for each of the construction phases and right-of-way grants. These plans will consider site-specific conditions and design considerations to maximize reclamation success.	A Reclamation Plan for the Rail Facility that accounts for site-specific conditions is included in the site-specific plan of development.
A-1-16	Wetland Resources	Facilities would be sited to avoid and/or minimize impacts.	The Rail Facility is located to minimize impacts to wetlands to the maximum extent practicable.
A-1-17	Wetland Resources	Any construction that occurs in or adjacent to wetlands and streams would use BMPs to protect surface water quality and minimize impacts to those resources.	BMPs to protect surface water quality and minimize impacts to wetlands will be implemented for construction in or adjacent to wetlands and streams per the Stormwater Pollution Prevention Plan for the Rail Facility.
A-1-18	Cultural Resources	Class III inventories of all proposed disturbance areas associated with the site-specific POD will be conducted prior to construction.	Class III inventories have been conducted for all proposed disturbance areas within the Rail Facility Site.

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-19	Cultural Resources	All cultural resource identification, evaluation, and treatment, including as a result of unexpected discovery at such time that construction has been permitted, will follow the stipulations of the Programmatic Agreement (PA) established for the project.	PCW will follow the stipulations of the PA regarding cultural resource identification, evaluation, and treatment, including unexpected discoveries.
A-1-20	Paleontological Resources	In the event that fossils are discovered on public lands during construction activities, PCW will suspend work in that area, have an on-call paleontologist review the fossils, and notify the BLM. PCW expects the significance of the discovery and the resulting course of action to be determined within 48 hours of discovery.	PCW will have a paleontologist on-call and agrees to suspend construction activities within the immediate area if fossils are discovered on federal lands for up to 48 hours while BLM evaluates the fossils' significance.
A-1-21	Watershed Resources	PCW has implemented a watershed monitoring program to evaluate potential impacts of project construction and operations. PCW commits to continue watershed monitoring efforts for three years post-construction.	PCW will continue watershed monitoring until three years post-construction, in accordance with the Watershed Monitoring Plan for the CCSM Project.
A-1-22	Greater Sage-Grouse	PCW will work cooperatively with BLM and WGFD to perform annual lek monitoring within the Ranch in accordance with approved WGFD protocols during pre-construction, construction and for five years post-construction.	PCW will continue to work with BLM and WGFD to perform annual lek monitoring within the Ranch prior to and during construction, as well as for five years post-construction.
A-1-23	Greater Sage-Grouse	PCW will work with BLM and private landowners to identify fences that pose a significant collision risk to sage-grouse. Identified fences will be removed or marked as practicable. To date PCW and TOTCO have removed over 10 miles of fence and have marked an additional 16 miles of fence with reflective bird diverters.	PCW will continue to work with BLM and private landowners to identify fences that pose a significant collision risk to sage-grouse and to remove or mark them as practicable. Within the Rail Facility, several miles of fence adjacent to the Deadman Creek lek were marked or removed.

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-24	Greater Sage-Grouse	PCW will work with BLM and private landowners to evaluate proposed new fences and determine the risk of such fences to sage-grouse. If significant risk exists, new fence construction will be deferred where possible; if fences must be constructed they will be marked with reflective bird diverters.	Temporary and permanent fences required by the Rail Facility have been evaluated. Fences within 0.25 mile of leks have been deferred or will be marked with reflective bird diverters.
A-1-25	Avian Species including Bald and golden Eagles and Greater Sage-Grouse	Guy wires on meteorological towers will be marked with reflective bird diverters. To date PCW has marked all guy wires on Project meteorological towers with reflective bird diverters.	Not applicable. The Rail Facility site-specific plan of development does not include meteorological towers.
A-1-26	Wildlife including Greater Sage-Grouse, Other Avian Species and Small Mammals	PCW will work with private landowners to install metal mesh escape ladders in water tanks that pose a risk to wildlife species. To date, PCW and TOTCO have installed metal mesh escape ramps on many Ranch water tanks.	PCW will continue to work with private landowners to identify water tanks on the Ranch that pose a risk to wildlife species and will continue to install metal mesh escape ladders in those tanks.
A-1-27	Wildlife including Greater Sage-Grouse and Bald and Golden Eagles	PCW will work with BLM and private landowners to stabilize and rehabilitate burned areas to promote the biological integrity of the site and limit expansion of invasive species. In 2010 PCW and TOTCO pursued stabilization and recovery of a burned area in the Chokecherry site with an emphasis on rapid recovery and use of the area by sage-grouse and other species.	PCW will continue to work with BLM and private landowners to stabilize and rehabilitate any newly or recently burned areas on the Ranch.
A-1-28	Wildlife including Greater Sage-Grouse and Bald and Golden Eagles	PCW will work with private landowners and water right owners to pursue water improvement conservation projects to benefit greater sage-grouse and other wildlife species in accordance with all applicable rules and regulations.	PCW will continue to work with private landowners and water right owners to pursue water improvement conservation projects to benefit greater sage-grouse and other wildlife species.

TABLE 2. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Environmental Resource	Applicant Committed Measure	Implementation
A-1-29	Wildlife including Greater Sage-Grouse and Bald and Golden Eagles	PCW will work with private land owners to enhance fallow agricultural fields on the Ranch located east of the North Platte River. Enhancements include vegetation treatments to improve forage and cover for greater sage-grouse.	PCW will continue to work with private land owners to enhance fallow agricultural fields on the Ranch located east of the North Platte River.
A-1-30	Wildlife including Greater Sage-Grouse and Bald and Golden Eagles	To minimize habitat fragmentation PCW will work with BLM and private landowners to close unnecessary roadways and reclaim such roads where practicable.	PCW has identified portions of unnecessary roadways that are within the Rail Facility Site and will reclaim these roads where practicable following construction of the CCSM Project.
A-1-31	Wildlife including Greater Sage-Grouse and Bald and Golden Eagles	PCW will work with BLM and private landowners to control the spread of noxious and invasive plant species.	PCW has inventoried noxious and invasive plants on the Rail Facility Site (Appendix J). PCW will work with BLM and private landowners to implement the CCSM Project Weed Management Plan to control the spread of noxious and invasive plant species.
A-1-32	Greater Sage-Grouse	PCW will work with private landowners to suspend the hunting of sage-grouse on private lands within the Ranch	Hunting of greater sage-grouse has been suspended on all private lands within the Ranch owned by TOTCO for purposes of greater sage-grouse conservation.
A-1-33	Greater Sage-Grouse	PCW will cooperate with agencies and private land owners to evaluate and implement predator control techniques to benefit sage-grouse as appropriate.	PCW continues to cooperate with agencies and private land owners to evaluate and implement predator control techniques to benefit sage-grouse as appropriate.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To				Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads	Collection T-Line		
A-2-01	Cultural Historic Trails	1 mile WTGs, 0.25 mile surface of the Overland Trail	Y	Y	Y	Y	Y	No, minimize crossings, cross at right angles		1 mile setback from the center of the Overland Trail as presently mapped (2008 RMP/ROD) in all areas except the following sections, where the BLM's RMP requirement of 0.25 miles were used: T18N R87W S6; T18N R88W S1; T18N R88W S2; T18N R88W S4; T18N R88W S7; T18N R88W S9; T18N R89W S11; T18N R89W S12; T18N R89W S13; T18N R89W S14; and the unmapped Overland Trail alternative route located in T18N R88W S6, T18N R89W S1, T18N R89W S2, T18N R89W S11, and T18N R89W S10.	The Rail Facility is located more than 1 mile from any contributing segments of the Overland Trail.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To					Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads	Collection	T-Line		
A-2-02	Lands and Realty - City/Town Limits	Structure base 0.5 mile setback	Y	Y	Y	Y	Y	No			Setback only applies to "towers," term not defined in Act; PCW to apply setback to WTGs, overhead collection, and transmission structures based on the height of each structure	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines, overhead collection, or transmission structures.
A-2-03	Lands and Realty Homes/ Occupied Buildings	Greater of 5.5 times total structure height or 1,000 ft. setback	Y	Y	Y	Y	N	No			Setback only applies to "towers," term not defined in Act; PCW to apply setback to WTGs, overhead collection, and transmission structures based on the height of each structure	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines, overhead collection, or transmission structures.
A-2-04	Lands and Realty - ROW Setback	5D from ROW boundary	N	N	Y	Y	N	No			Waiver may be granted	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To			Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads Collection T-Line		
A-2-05	Lands and Realty - Subdivisions	Greater of 5.5 times total structure height or 1,000 ft. setback	Y	Y	Y	Y	Y	Yes, except underground	Setback applies to all above-ground construction, underground appears permissible within setback	The Rail Facility is more than 1,000 feet from existing subdivisions.
A-2-06	Lands and Realty - WTGs	Tower base 1.1 times total structure height from external property lines	Y	Y	Y	Y	N	No	Setback only applies to "towers," term not defined in Act; PCW to apply setback to WTGs, overhead collection, and transmission structures based on the height of each structure	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines, overhead collection, or transmission structures.
A-2-07	Lands and Realty - WTGs	Tower base 1.1 times total structure height from any public ROWs	Y	Y	Y	Y	N	No	Setback only applies to "towers," term not defined in Act; PCW to apply setback to WTGs, overhead collection, and transmission structures based on the height of each structure	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines, overhead collection, or transmission structures.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To					Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads	Collection	T-Line		
A-2-08	Recreation - Teton Reservoir	1 mile boundary WTGs of Teton Reservoir	Y	Y	Y	Y	N	No			WTG placement would be prohibited within one mile of the Teton Reservoir Recreation Site.	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines; regardless, the Rail Facility Site is well over one mile from the boundary of Teton Reservoir.
A-2-09	Water - North Platte River	1 mile high water mark WTGs of the North Platte River	Y	Y	Y	Y	Y	No, avoid if possible			WTG placement would be prohibited within one mile of the ordinary high water mark of the North Platte River.	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines or substations. Portions of the River Road and North Platte Pump Station are within one mile of the ordinary high water mark of the North Platte River; however, these facilities have been designed to avoid and minimize visual impacts.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To					Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads	Collection	T-Line		
A-2-10	Wildlife - Red Rim Grizzly Wildlife Habitat Area (WHMA)	No development within Red Rim-Grizzly WHMA within the Wyoming Sage-Grouse Core Management Areas Version 3 Map (finalized June 29, 2010)	Y	Y	Y	Y	Y	Yes			The Wyoming Game and Fish Department's (WGFD) Red Rim-Grizzly WHMA is approximately 37,630 acres in total, of which approximately 1,200 acres (3%) lie outside Sage-Grouse Core Management Areas Version 3. The area outside Sage-Grouse Core Management Areas Version 3 is located in the northeast corner of the Grizzly WHMA and is a part of or adjacent to Miller Hill. PCW may locate facilities within this area of the Grizzly WHMA.	The Rail Facility Site is not located within the Red-Rim Grizzly WHMA.

TABLE 3. SUMMARY OF APPLICANT COMMITTED MEASURES (ROD TABLE D-2)

Item	Resource Concern	Restriction Distance	Jurisdiction			Applies To					Notes	Implementation
			Private	State	BLM	WTGs	Subs	Roads	Collection	T-Line		
A-2-11	Wildlife- Sage-Grouse Core Breeding Area	No facilities within the Wyoming Sage-Grouse Core Management Area Version 3 Map (finalized June 29, 2010)	Y	Y	Y	Y	Y	Yes			No construction of any facilities (WTGs, roads, transmission lines, collector lines, substations, staging areas, etc.) in Wyoming's Sage-Grouse Core Management Areas Version 3 (finalized June 29, 2010).	The Rail Facility is outside designated greater sage-grouse core areas (Order 2011-5, Attachment A, Sage-Grouse Core Breeding Areas Version 3).

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-01	Air – Dust Control	Water would be applied twice per day, or as deemed necessary by the Environmental Inspector, to all disturbed surfaces (i.e., exposed, dry, and unfrozen) during construction. During operation, dust control would occur twice per day in those areas where vehicular traffic exceeds normal operational needs. If, for example, heavy equipment is brought on site for maintenance or if vehicular traffic exceeds a few vehicles per day, additional dust control watering would be initiated.	PCW will apply water as necessary per the CCSM Project Dust Control Plan.
A-3-02	Air – Dust Control	Magnesium chloride may be applied, if necessary, for adequate dust suppression. These treatments would occur on an as-needed basis, depending on weather conditions and the amount of traffic on the road.	PCW will apply magnesium chloride as necessary per the CCSM Project Dust Control Plan. In accordance with current BLM policy, PCW will not apply chloride compounds or lignin derivatives within 500 feet of a perennial stream on federal lands.
A-3-03	Air – Dust Control	The driving surface of all roads constructed for project access would be surfaced with gravel to further reduce potential dust emissions.	All roads associated with the Rail Facility will be surfaced with gravel.
A-3-04	Air – Dust Control	Dust abatement techniques would be used on unpaved, unvegetated surfaces to minimize airborne dust. Dust abatement techniques would be employed on construction materials and stockpiled soils if they are a source of fugitive dust. Dust abatement techniques would be used before and during surface clearing, excavation, or blasting activities.	PCW will use dust abatement techniques on unpaved, unvegetated surfaces and material stockpiles, as described in the CCSM Project Dust Control Plan.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-05	Air – Dust Control	Speed limits (e.g., 25 miles per hour [mph] [40 kilometers per hour [km/h]) would be posted along all access roads and enforced during construction and maintenance activities and enforced to reduce airborne fugitive dust.	The Rail Facility access road will have a posted speed limit that will be enforced during construction, operation, maintenance, and decommissioning of the Rail Facility.
A-3-06	Air – Vehicle Emissions	All construction equipment would be maintained in good working condition and would contain appropriate pollution control devices to minimize trace gas emissions.	PCW will maintain construction equipment for the Rail Facility in good working condition. All construction equipment will have appropriate pollution control devices.
A-3-07	Cultural and Paleontological Resources	Unexpected discovery of cultural or paleontological resources during construction would be brought to the attention of the responsible BLM authorized officer immediately. Work would be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.	PCW agrees to suspend activities within the immediate area of cultural or paleontological resources discovered on federal lands. PCW will follow the stipulations of the PA regarding cultural resource identification, evaluation, and treatment, including unexpected discoveries. For paleontological resources, PCW will have a paleontologist on-call and agrees to suspend construction activities within the immediate vicinity of fossils discovered on federal lands for up to 48 hours while BLM evaluates the fossils' significance.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-08	General – Decommissioning	Prior to the termination of the right-of-way authorization, a decommissioning plan would be developed and approved by the BLM. The decommissioning plan would include a decommissioning impact analysis, site reclamation plan and monitoring program. All management plans, BMPs, and stipulations developed for the construction phase would be applied to similar activities during the decommissioning phase as agreed to between BLM and PCW.	PCW will develop a decommissioning plan for the Rail Facility, as described in the site-specific plan of development, section 7.
A-3-09	General – Decommissioning	All turbines and ancillary (above-ground) structures would be removed from the site.	All above-ground structures associated with the Rail Facility will be removed during decommissioning.
A-3-10	General – Avoidance of sensitive areas	PCW would work with the BLM to mitigate for environmentally sensitive areas. Marshy soils, drainage bottoms, and riparian areas would be avoided to the extent practicable.	The Rail Facility has been designed to avoid and minimize impacts to environmentally sensitive areas. Marshy soils, drainage bottoms, and riparian areas have been avoided to the extent practicable. Impacts to wetlands will be mitigated through the USACE section 404 permitting process.
A-3-11	General – Electrical Lines	All underground electrical collector lines would be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance when possible).	The Rail Facility site-specific plan of development does not include electrical collector lines; however, other buried utilities will be routed adjacent to the rail lines, access road, or laydown areas to minimize additional surface disturbance.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-12	General – Environmental Compliance	An Environmental Compliance Plan (ECP) would be developed and implemented to monitor implementation of mitigation measures during project construction. An Environmental Inspector would be on-site to oversee the implementation of the Project ECP.	The Environmental Compliance Plan for the CCSM Project is included in the site-specific plan of development for the Rail Facility.
A-3-13	General – Maintenance	The transmission lines would be inspected two times per year by ground or aerial patrols, and maintenance would be performed as necessary. Substation maintenance activities would include routine, scheduled equipment maintenance and grounds keeping. Once reclamation is complete and vegetation is stable, noxious weed surveys of the Project areas would be conducted on a regular basis. Inspection of the Project access roads and internal resource roads would include weed monitoring and treatment, as outlined in the Weed Management Plan.	Not applicable. The Rail Facility site-specific plan of development does not include transmission lines or substations. PCW will conduct reclamation monitoring in accordance with the Reclamation Plan for the Rail Facility. Weed monitoring and treatment will be completed in accordance with the CCSM Project Weed Management Plan.
A-3-14	General – Maintenance	Inoperative turbines would be repaired, replaced or removed in a timely manner.	Not applicable. The Rail Facility site-specific plan of development does not include wind turbines.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-15	General – Mitigation Measures	All control and mitigation measures established for the Project in the POD and the resource-specific management plans that are part of the POD would be maintained and implemented throughout the operational phase, as appropriate. These control and mitigation measures would be reviewed and revised, as needed, based on the mutual agreement of PCW and BLM, to address changing conditions or requirements within the Project area, throughout the operational phase. This dynamic approach would help ensure that impacts from operations are kept to a minimum.	PCW will implement applicable resource protection measures outlined in the ROD during construction, operation, maintenance and decommissioning of the Rail Facility. All resource protection measures and plans are intended to be adaptive. With concurrence from the BLM Authorized Officer, PCW may modify resource protection measures and plans to address changing conditions and requirements.
A-3-16	General – Project Disturbance	The number and size/length of roads, temporary fences, lay-down areas, and borrow areas would be minimized.	PCW has minimized the disturbance associated with the Rail Facility to the extent practicable to meet the needs of the CCSM Project.
A-3-17	General – Project Footprint	The area disturbed by construction-related activities (i.e., footprint) would be kept to a minimum.	PCW has minimized the disturbance associated with the Rail Facility to the extent practicable to meet the needs of the CCSM Project.
A-3-18	General – Project Footprint	The area disturbed by operational-related activities (i.e., footprint) would be kept to a minimum.	PCW has minimized the disturbance associated with the Rail Facility to the extent practicable to meet the needs of the CCSM Project.
A-3-19	Geology – Seismic Considerations	All structures will be built to appropriate seismic requirements for the local geology.	PCW has completed geologic testing to insure that the Rail Facility design is appropriate to the local geology and seismology.
A-3-20	Hazardous Materials – SPCC Plan	A Spill Prevention, Control, and Countermeasures (SPCC) Plan would be implemented during the construction and operation phases of Project. The SPCC would define procedures to be used in the event of an accidental spill from vehicles or other equipment.	A SPCC Plan is included in the site-specific plan of development for the Rail Facility. The SPCC will be implemented during construction, operation, maintenance and decommissioning of the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-21	Hazardous Materials – Accidental Release	In the event of an accidental release of hazardous materials to the environment, the operator would document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event would be provided to the BLM authorized officer and other federal and state agencies, as required.	Procedures to respond to accidental releases of hazardous materials will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-22	Hazardous Materials – ESA	A Phase I Environmental Site Assessment would be required prior to the purchase of a property and would be conducted by a trained and experienced environmental professional. If the Phase I Environmental Site Assessment identifies potential hazardous substances, a Phase II Environmental Site Assessment is usually conducted to confirm the presence and extent of contamination.	Not applicable. No property will be purchased for development of the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-23	Hazardous Materials – Handling	Pursuant to the Project's Hazardous Materials Management Plan, all personnel handling hazardous materials would be trained appropriately on the dangers of, and safety precautions to be taken, when working with hazardous materials. Any hazardous materials used on-site would be documented and properly labeled. Material Safety Data Sheets (MSDS) and proper handling procedures would be located on-site. In the event a significant chemical spill occurs, personnel should evacuate the immediate area (as required) and report the release. The Emergency Response Team would be called to the area to assess the extent of the emergency and would determine appropriate response actions based on the Emergency Response Plan.	A detailed hazardous materials management plan compliant with this measure will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-24	Hazardous Materials – Secondary Containment	Secondary containment would be provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) would be a temporary activity occurring only for as long as is needed to support construction activities.	Hazardous material and hazardous waste will be stored in secondary containment. A detailed hazardous materials management plan will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction. Fuel storage will be in accordance with the SPCC Plan for the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-25	Hazardous Materials – Storage, Handling, and Disposal	Safety measures would be implemented in accordance with Occupational Safety and Health Administration (OSHA) standards and operator requirements. Petroleum products (e.g., lubricating oils and greases) and items such as touch-up paint and fiberglass blade repair materials would be stored on-site for maintenance operations. All such wastes/substances would be handled, stored in a secured location, and disposed of in accordance with applicable federal, state, and local regulations.	CCSM Project personnel will follow all applicable federal, state, and local regulations, including OSHA standards and operator requirements. Oil products will be handled in accordance with the SPCC Plan. Hazardous materials and hazardous waste will be managed in accordance with the hazardous materials management plan. A detailed hazardous materials management plan will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-26	Health and Safety – Crane Operation	Crane safety training would be conducted to ensure riggers and ground workers understand the hazards of working around mobile cranes and that they watch for signs of problems at all times, especially if power lines are nearby. Standard operating procedures would be developed and implemented for safely lifting loads. A written engineered lift plan for all critical lifts would be developed and followed.	Crane safety training requirements and standard operation procedures for lifts will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-27	Health and Safety – Crane Operation	Crane operators would take the following steps to protect themselves and other workers when operating mobile cranes on the Project Sites: 1) the minimum clearance between power lines and the crane or load would be 10 ft. for lines rated 50-kV or below; 2) for lines over 50-kV, the minimum clearance would be 10 ft. plus 0.4 foot for each 1-kV over 50-kV; 3) operation of a crane outside of design limitations, manufacturer's specifications, or without the load charts would be prohibited; 4) cranes would be operated only when wind velocities are under the maximum speeds stipulated for safe operation (these velocities are generally stated in the manufacturer's specifications); 5) cranes would be inspected daily prior to each use, monthly, and annually, and the records of these inspections would be available on the machine; 6) rigging equipment would be inspected daily; 7) all operators of mobile cranes would have, and be familiar with, the additional requirements in the ANSI standard; 8) the latch in the hook throat opening would never be tied back; and 9) employees would not be suspended from the cranes and the use of cranes for suspended personnel platforms would be avoided.	Crane safety training requirements and standard operation procedures for lifts will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-28	Health and Safety – Crane Operation	Meteorological stations would monitor wind speeds on the job site to support safe crane operating standards.	Crane safety training requirements and standard operation procedures for lifts will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-29	Lands and Realty – Foreign Lines, Monuments, and Markers	All foreign lines would be marked. Monuments and markers (i.e., General Land Surveys and BLM Cadastral Survey Corners, reference corners, U.S. Coastal and Geodetic benchmarks) would be protected during the construction and operational phases of the Project. In the event that a monument or marker is disturbed, the employee would report the incident in writing to the Authorized Officer. PCW, in consultation with the BLM or other appropriate agency, would be responsible for re-surveying and replacing any markers that are disturbed.	PCW will protect monuments and markers during construction, operation, maintenance, and decommissioning of the Rail Facility. Disturbance of any monuments or markers will be reported to the BLM Authorized Officer.
A-3-30	Noise – Blasting and Noisy Activity	If blasting or other noisy activities are required during the construction period, nearby residents would be notified in advance.	PCW will notify landowners adjacent to the Rail Facility Site of general construction activities prior to commencement of construction each season. No blasting is anticipated to be required for construction of the Rail Facility.
A-3-31	Noise – Construction Equipment	All equipment would have sound-control devices no less effective than those provided on the original equipment. All construction equipment used would be adequately muffled and maintained.	PCW will maintain construction equipment for the Rail Facility in good working condition. All construction equipment will have appropriate sound control devices no less effective that those provided by the manufacturer.
A-3-32	Noise – Construction Equipment	All stationary construction equipment (i.e., compressors and generators) would be located as far as practicable from nearby residences.	PCW will locate stationary construction equipment as far from nearby residences as practicable.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-33	Noise – Road Use	Road use specifications designed to keep traffic to a minimum would be implemented to the maximum extent practical.	PCW will minimize traffic on the Rail Facility roads to the maximum extent practical.
A-3-34	Noise – Turbine Noise	All WTGs would be properly maintained to prevent excessive noise.	Not applicable. The Rail Facility does not include wind turbines.
A-3-35	Public Health and Safety – Construction Practices	A Project Health and Safety Plan would be implemented in accordance with OSHA standards. Hard hat requirements and "authorized personnel only" signs would be posted at the entrance to the main access points during construction. Permanent signs would be posted at gates on the main access roads. Safety signs (e.g., speed limits, steep grades, etc.) would be placed along the main access roads in accordance with local, state, and federal regulations. Safety signing would be posted on all transformers, at high-voltage facilities, along roads, and around towers (if necessary) in conformance with applicable state and federal regulations.	A detailed site health and safety plan will be implemented for the CCSM Project in accordance with applicable local, state and federal regulations. The site health and safety plan will be developed by the general contractor immediately prior to construction. Signage will be posted as required throughout the Rail Facility Site in accordance with local, state, and federal regulations.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-36	Public Health and Safety – Construction Practices	A comprehensive and continuous occupational Injury and Illness Prevention Program (IIPP) would be implemented and enforce a code of safe practices (CSP) for all employees. A designated field safety person would be responsible for on-site management and administration of the IIPP and CSP. Occupational safety and health matters would be communicated to employees by written documentation, staff meetings, formal and informal training, weekly safety meetings, and posted information. Communication from employees to supervisors or safety representatives about unsafe or unhealthy conditions would be encouraged and may be verbal or written. Results of investigations of any employee safety suggestion or report of hazard would be distributed to all employees affected by the hazard or posted, as appropriate.	A detailed site health and safety plan compliant with this measure will be developed for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-37	Public Health and Safety – Construction Practices	Each supervisor would conduct an inspection to identify unsafe working conditions and practices, as follows: 1) weekly in all areas; 2) whenever new substances, procedures, or equipment that may represent a new safety or health hazard are introduced to the job site; and 3) whenever a supervisor is made aware of a new or previously unrecognized hazard. A hazard checklist or hazard assessment form would be used to document inspections. Employees may not enter a hazard area without appropriate protective equipment, training, and prior specific approval by the IIPP and CSP administrator.	A detailed site health and safety plan compliant with this measure will be developed for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-38	Public Health and Safety – Fire Management	Fire control would be provided pursuant to the Project's Fire Safety Plan.	A fire safety plan compliant will be included in the site health and safety plan for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-39	Public Health and Safety – Fire Management	Fire prevention standards would be followed to reduce the risk of a fire, in accordance with 36 CFR 261 and the Wyoming Interagency Fire Restriction Plan. All hot work that is to occur on site would be done in accordance with OSHA Regulation 29 CFR 1910.252(a).	A detailed site health and safety plan compliant with this measure will be developed for the CCSM Project. The site health and safety plan will be developed by the general contractor immediately prior to construction.
A-3-40	Reclamation	All areas of disturbed soil would be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation activities would be undertaken as early as possible on disturbed areas not required for operation.	Reclamation of the Rail Facility Site will be completed in accordance with the Reclamation Plan for the Rail Facility.
A-3-41	Reclamation – Roadways	Access roads would be regraded, the topsoil replaced, and all disturbed areas would be re-vegetated. Any roadway damage due to the transport of the heavy equipment would be repaired on the public roadways upon the completion of Project construction and decommissioning.	Reclamation of the Rail Facility Site will be completed in accordance with the Reclamation Plan for the Rail Facility. PCW will repair any damage to existing or public roadways following CCSM Project construction and decommissioning in coordination with appropriate federal, state, and local agencies and private landowners.
A-3-42	Reclamation – Topsoil	Topsoil from all decommissioning activities would be salvaged and reapplied during final reclamation.	Reclamation of the Rail Facility Site will be completed in accordance with the Reclamation Plan for the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-43	Reclamation – Vegetation	All areas of disturbed soil would be reclaimed using weed-free native shrubs, grasses, and forbs. The vegetation cover, composition, and diversity would be restored to values commensurate with the ecological setting.	Reclamation of the Rail Facility Site will be completed in accordance with the Reclamation Plan for the Rail Facility.
A-3-44	Recreation – Public Access	Temporary fencing would be installed around staging areas and storage yards during construction to limit public access. Public access to open excavations would be limited by either installation of locked gates at public access points, or utilization of other approved means of limiting public access.	PCW will install fencing and signage as needed to protect public safety and prevent unauthorized access.
A-3-45	Recreation – Public Access	Permanent fencing would be installed and maintained around electrical substations, and turbine tower access doors would be locked to limit public access during operations.	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines or substations.
A-3-46	Roads – General Design	DELETED[1]	
A-3-47	Roads – General Design	Access roads and on-site roads would be surfaced with aggregate materials, wherever appropriate.	The Rail Facility roads will have a gravel surface, as described in the site-specific plan of development.
A-3-48	Roads – General Design	Access roads would be located to follow natural contours where possible and minimize side hill cuts.	The Rail Facility access road follows natural contours to the extent practical.
A-3-49	Roads – General Design	DELETED[1]	

[1] Power Company of Wyoming (PCW). 2012. Memorandum from G. Miller (PCW) to P. Murdock (BLM) dated April 10, 2012.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-50	Roads – General Design	Roads would be located upwind from WTG rows, where possible, such that drifting caused by towers or transformers is not likely to accumulate on roads.	The Rail Facility site-specific plan of development does not include roads in close proximity to wind turbines such that drifting caused by wind turbines is anticipated to be an issue.
A-3-51	Roads – General Design	Roads are designed in accordance with the BLM Gold Book (BLM 2007a) design criteria as well as the BLM Manual 9113: Roads (BLM 1985).	The Rail Facility roads are designed to meet the BLM Gold Book and BLM Manual 9113 design criteria, as applicable. Detailed information on the road design criteria is included in Appendix C to the Rail Facility site-specific plan of development.
A-3-52	Roads – General Design	Existing roads would be used, but only if in safe and environmentally sound locations. If new roads are necessary, they would be designed and constructed to the appropriate BLM road design standards where practical and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles).	The Rail Facility uses only small portions of existing roads, as identified in the Rail Facility site specific plan of development. The Rail Facility roads are designed to meet the BLM Gold Book and BLM Manual 9113 design criteria, as applicable. Detailed information on the road design criteria is included in Appendix C to the Rail Facility site-specific plan of development.
A-3-53	Roads – General Design	Final roadway alignments will include erosion control measures to stabilize steeper slopes and to prevent loss of soil. These measures will include hay bales, shallow swales and ditches, rock/rip rap embankments, and culvert outlet protection. Final alignments will be ground-verified using BLM Rawlins Field Office knowledge of potentially problematic areas for road construction and/or maintenance.	Erosion control measures for the Rail Facility are described in the Rail Facility Erosion Control Plan and are detailed in the Issued for Permit Plans.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-54	Roads – General Design	Where road intersection improvements are required to accommodate extra-long vehicles, potential upgrades could include placement of relocating signs, placement of temporary paving, and use of flaggers, as needed. All intersection improvements would be restored to their original condition upon the completion of construction.	PCW anticipates installing temporary improvements at I-80 Exit 221 and along CIG Road to accommodate extra-long trailers. Upgrades including relocating signs, placement of temporary compacted fill and gravel, and use of flaggers will be implemented as needed. All intersection improvements will be restored to their original condition upon the completion of CCSM Project construction.
A-3-55	Roads – General Design	Where road-cattle guard intersection improvements are required to accommodate overweight vehicles, potential road profile upgrades may be required to allow travel safely over the cattle guards. All damaged cattle guards would be replaced upon the completion of construction.	PCW does not anticipate impacts to existing cattle guards or the need for intersection improvements at existing cattle guards; however, if cattle guards are damaged due to CCSM Project traffic, PCW will repair or replace the cattle guards upon the completion of CCSM Project construction.
A-3-56	Roads – General Design	All existing roads that would be used as primary access locations to the Project area would need to be upgraded to accommodate the anticipated extra traffic generated by the Project. Most of these roads are county roads or two-track roads that would need to be widened to accommodate the construction traffic. All necessary federal, state, and local permits would be obtained to complete this work prior to construction.	PCW anticipates minimal upgrades will be required to Interstate 80 Exit 221 and CIG Road. PCW will upgrade these roads as needed, and will obtain all necessary federal, state, and local permits prior to construction.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-57	Roads – General Design	During the course of construction, if excessive wear and tear to the existing roadway surface is evident, these road surfaces would be restored to their original condition upon the completion of construction. Where necessary, consultation with the UPRR would be required to change the roadway profile at specific at-grade railroad crossings to smooth the existing hump for low-profile vehicles; consultation with various utility companies would be required to elevate the risk of oversized vehicles in relation to low-hanging power lines.	If excessive wear and tear to existing roads is caused by the CCSM Project, PCW will restore the road surfaces to their original condition upon the completion of CCSM Project construction. PCW is working with utility companies to design adequate crossings of underground and aboveground utilities and does not anticipate impacts or upgrades to existing at-grade railroad crossings.
A-3-58	Roads – General Design	Due to crest and sag vertical curves in the roadway profile, select locations would require re-grading prior to hauling extra-long loads. Any grades greater than 10 percent would require assist vehicles on-hand for the large tractor-trailers hauling WTG components. Any grades greater than 7 percent would require assist vehicles on-hand. These locations would be verified during the final design process. In addition, any construction site with grades ranging from 5 to 7 percent on non-paved roadways would require an assist vehicle on stand-by during adverse weather or road conditions.	PCW does not anticipate any re-grading of existing roads will be required, with the exception of minimal upgrades to widen CIG Road. Steep grades have been avoided for the Rail Facility to the extent practicable; however, PCW anticipates having assist vehicles on-hand at the Rasmussen Climb and Miller Hill Road (where the grade exceeds 10 percent) as needed during wind turbine component deliveries. PCW will dispatch assist vehicles to other locations as necessary to support WTG deliveries during adverse weather or road conditions.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-59	Roads – General Use	Traffic would be restricted to the roads developed for the Project. Use of other unimproved roads would be restricted to emergency situations. Signs would be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information.	Traffic associated with the Rail Facility will be restricted to the CCSM Project road network once it arrives on-site. Signs will be placed as needed to identify speed limits, travel restrictions, and other standard traffic control information.
A-3-60	Roads – Maintenance	Most road maintenance would be performed on an as-needed basis. The frequency and type of maintenance that would be required would be determined by routine inspections. The inspections would be performed on a regular basis and following snowmelt or heavy or prolonged rainfall. Inspections would identify maintenance needs for reduction of ruts and holes, maintenance of crowns and outslopes to keep water off the road, replacement of surfacing materials, clearing of sediment blocking ditches and culverts, maintenance of interim reclamation, and noxious weed control.	PCW will perform routine inspections of the Rail Facility roads and will perform maintenance as needed.
A-3-61	Roads – Maintenance	All roads would be maintained in a safe and environmentally responsible manner.	PCW will perform routine inspections of the Rail Facility roads and will perform maintenance as needed.
A-3-62	Roads – Operation Access	Project operation would require the use of the new roads for equipment and personnel to reach the WTGs. In addition, an access road that runs adjacent to each WTG site and the project substations would be used.	The site-specific plan of development for the Rail Facility describes the roads that will be used during construction, operation, maintenance, and decommissioning of the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-63	Roads – Operation Access	Internal resource roads would be located within the project boundaries and would provide access to each WTG. All internal resource roads would be surfaced with gravel. As part of routine maintenance activities, internal resource roads would be maintained in a condition that allows for continued access to the WTGs.	The Rail Facility roads will have a gravel surface, as described in the site-specific plan of development. PCW will perform routine inspections of the Rail Facility roads and will perform maintenance as needed.
A-3-64	Roads – Reclamation	Abandoned roads and roads that are no longer needed would be recontoured and revegetated.	Roads within the CCSM Project Site that are abandoned or rendered unnecessary by the Rail Facility will be effectively reclaimed.
A-3-65	Soils and Geology –Slopes	Operators would identify unstable slopes and local factors that can induce slope instability. Operators also would avoid creating excessive slopes during excavation and blasting operations. Special construction techniques would be used where applicable in areas of steep slopes, erodible soil, and stream channel crossings.	The Rail Facility design accounts for slope stability and local soil conditions.
A-3-66	Soils – Erosion Control	Erosion control measures would be employed as described in the Master Reclamation Plan	Erosion control measures for the Rail Facility are detailed in the Erosion Control Plan, Stormwater Pollution Prevention Plan, and Reclamation Plan.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-67	Soils – Erosion Control	Permanent erosion control devices would be installed during project construction and may include, but are not limited to, waterbars, roadside ditches with subsurface culverts, berms, trash racks on culverts, energy-dissipating structures, mulches, and establishment of permanent vegetation. Erosion controls that comply with county, state, and federal standards would be applied. Practices such as jute netting, silt fences, and check dams would be applied near disturbed areas. The Environmental Inspector would monitor construction to ensure that erosion control devices are functioning properly.	Erosion control measures for the Rail Facility are detailed in the Erosion Control Plan, Stormwater Pollution Prevention Plan and Reclamation Plan for the Rail Facility. Erosion control devices will be inspected and maintained in accordance with the Erosion Control Plan, Stormwater Pollution Prevention Plan and Reclamation Plan for the Rail Facility.
A-3-68	Soils – Erosion Control	Final roadway alignments would include erosion control measures to stabilize steeper slopes and to prevent loss of soil. These measures would include hay bales, shallow swales and ditches, rock/rip rap embankments, and culvert outlet protection.	Erosion control measures for the Rail Facility are detailed in the Erosion Control Plan, Stormwater Pollution Prevention Plan and Reclamation Plan for the Rail Facility.
A-3-69	Soils – Erosion Control	If, during operation, it is determined that snow accumulation causes significant accelerated erosion, appropriate mitigation measures (e.g., snow fence construction) would be developed and implemented.	Erosion control measures for the Rail Facility are detailed in the Erosion Control Plan, Stormwater Pollution Prevention Plan and Reclamation Plan for the Rail Facility. Snow accumulation control through snow fencing is detailed in the Winter Access Plan.
A-3-70	Soils – Excavation and Blasting Activities	Foundations and trenches would be backfilled with originally excavated material as much as possible. Excess excavation materials would be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.	Soil handling for the construction, operation, maintenance, and decommissioning of the Rail Facility will be in accordance with the Reclamation Plan for the Rail Facility.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-71	Soils – Excavation and Blasting Activities	Borrow material would be obtained only from authorized and permitted sites. Existing sites would be used in preference to new sites when possible.	Borrow materials for the Rail Facility will be obtained from the Rail Facility Site, the Road Rock Quarry, or other areas within the CCSM Project when suitable.
A-3-72	Soils – Topsoil Handling	Topsoil from all excavations and construction activities would be salvaged and reapplied during reclamation.	Soil handling for the construction, operation, maintenance, and decommissioning of the Rail Facility will be in accordance with the Reclamation Plan for the Rail Facility.
A-3-73	Soils – Topsoil Handling	Topsoil material suitable for site reclamation would be removed in conjunction with clearing and grading and reserved in local stockpiles. Topsoil storage areas would generally be located within staging areas and alongside roadways during construction.	Soil handling for the construction, operation, maintenance, and decommissioning of the Rail Facility will be in accordance with the Reclamation Plan for the Rail Facility.
A-3-74	Soils – Wet Soils During Construction	Construction activities would be suspended when soils are wet. Construction would resume when soils become dry enough to support construction equipment. The Environmental Inspector (EI) would determine when conditions are too wet to continue.	PCW will suspend construction activities when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting.
A-3-75	Transportation – Traffic Considerations	To minimize impacts on local commuters, consideration would be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time. Consideration would also be given to opportunities for busing of construction workers to the job site to reduce traffic volumes.	Impacts to traffic levels on public roadways caused by the CCSM Project, including the Rail Facility, are evaluated in the Transportation Management Plan. PCW will consider the use of mitigation measures such as off-peak commuting where necessary to maintain acceptable intersection levels of service.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-76	Transportation – Transportation Planning	Ongoing ground transportation planning would be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.	Impacts to traffic levels on public roadways caused by the CCSM Project, including the Rail Facility, are evaluated in the Transportation Management Plan, including mitigation measures that will be implemented as needed.
A-3-77	Transportation – Transportation Planning	Following the finalization of site access locations and proposed roadways, a Traffic Management Plan would be developed for traffic both on and off-site. The Traffic Management Plan would discuss flagging guidelines on and off site, specifics of auxiliary lanes if needed, requirements for signage during construction of the project, passing zone and striping details for the existing public roadways, and other details specific to the individual approved access locations leading to and from, and on, the Project area.	Impacts to traffic levels on public roadways caused by the CCSM Project, including the Rail Facility, are evaluated in the Transportation Management Plan, including mitigation measures that will be implemented as needed.
A-3-78	Vegetation – Noxious Weed	Noxious weed surveys would be conducted to evaluate the presence and areal extent of noxious weed and invasive species populations within the Project area. Preventative management measures would be applied as warranted pursuant to the Project's Weed Management Plan.	PCW has inventoried noxious and invasive plants on the Rail Facility Site (Appendix J). PCW will work with BLM and private landowners to implement the CCSM Project Weed Management Plan to control the spread of noxious and invasive plant species.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-79	Visual Resources	Operators would reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; utilizing undulating surface disturbance edges; stripping, salvaging and replacing topsoil; contoured grading; controlling erosion; using dust suppression techniques as required; and restoring exposed soils as closely as possible to their original contour and vegetation.	PCW has minimized the disturbance associated with the Rail Facility to the extent practicable to meet the needs of the CCSM Project. Reclamation will be in accordance with the requirements of the Rail Facility Reclamation Plan.
A-3-80	Visual Resources	Operators would monitor and maintain visual mitigation measures for the approved project in accordance with a visual monitoring and compliance plan. The operator would maintain revegetated surfaces until a self-sustaining stand of vegetation is reestablished and visually adapted to the undisturbed surrounding vegetation.	Reclamation will be in accordance with the requirements of the Rail Facility Reclamation Plan.
A-3-81	Waste Management – Disposal	Wastes would be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.	Waste from the Rail Facility will be managed in accordance with the requirements of the CCSM Project Waste Management Plan.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-82	Waste Management – Wastewater	Any wastewater generated in association with temporary, portable sanitary facilities would be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility or otherwise disposed of in accordance with applicable state and local laws and regulations. Temporary, portable sanitary facilities provided for construction crews would be adequate to support expected on-site personnel and would be removed at completion of construction activities.	PCW will provide adequate sanitary facilities for personnel working on the Rail Facility. All sanitary waste from the Rail Facility will be handled by a licensed sanitary waste vendor.
A-3-83	Water – SWPPP	The Project's SWPPP would be implemented in accordance with the Wyoming Department of Environmental Quality (WDEQ) requirements to obtain National Pollutant Discharge Elimination System (NPDES) compliance under Wyoming's NPDES permit WYR10-0000. The SWPPP would describe site-specific erosion control and stream crossing measures that would be implemented during the construction and operation phases of the Project. The Environmental Inspector would direct activities to ensure compliance with the SWPPP.	A SWPP Plan has been developed for the Rail Facility to meet the requirements of the WDEQ (Appendix I).
A-3-84	Water – Excavation and Blasting Activities	DELETED[2]	

[2] Power Company of Wyoming (PCW). 2012. Memorandum from G. Miller (PCW) to P. Murdock (BLM) dated April 10, 2012.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-85	Water – Excavation and Blasting Activities	Operators would avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.	Based on geologic investigations conducted to date, PCW does not anticipate that any excavations associated with the Rail Facility will be deep enough to impact aquifers.
A-3-86	Water – Road Design	DELETED[2]	
A-3-87	Water – Road Drainage	Whenever possible, existing drainage systems would not be altered, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion would be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.	The Rail Facility design minimizes impacts to existing drainage to the extent practical. Erosion control measures will be inspected and maintained as described in the SWPP Plan and Erosion Control Plan for the Rail Facility.
A-3-88	Water – Road Locations	Roads would be located away from drainage bottoms and avoid wetlands, if practicable.	The Rail Facility roads avoid wetlands and drainage bottoms to the extent practicable.
A-3-89	Water – Stream Crossings	Access roads would be located to minimize stream crossings. All structures crossing streams would be located and constructed so that they do not decrease channel stability or increase water velocity. Operators would obtain all applicable federal and state permits.	The Rail Facility access road has been designed to minimize stream crossings. All stream crossings have been designed to maintain channel stability.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-90	Water – Waterbodies and Wetlands	Waters of the U.S., including wetlands, will be avoided to the maximum extent practicable. Where these features cannot be completely avoided, impacts will be minimized through design modification, as necessary. Facilities (e.g., turbines, substations, staging areas) would be sited to avoid and/or minimize impacts; however, where impacts are anticipated (e.g., use of Project roads), minimization measures would be employed to minimize impacts (e.g., use of culverts to maintain downstream flow/drainage).	PCW has designed the Rail Facility to avoid impacts to wetlands to the maximum extent practicable. Where avoidance was not feasible, PCW has designed the Rail Facility to minimize impacts.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-91	Water – Waterbodies and Wetlands	All impacts would be the minimum necessary to accomplish the Project, would be mitigated, and the appropriate Section 404 permit would be obtained from the U.S. Army Corps of Engineers (USACE) Wyoming Regulatory Office prior to the start of construction. To complete the Section 404 permit, a delineation of all Waters of the U.S. (WUS), including wetlands, would be performed by qualified wetland scientists to obtain current site-specific data regarding the location and extent of aquatic features within the Project area. Current resource mapping (e.g., U.S. Geological Survey (USGS) topographic maps, U.S. Fish and Wildlife Service (USFWS) NWI maps, Federal Emergency Management Agency (FEMA) floodplain maps, Natural Resources Conservation Service (NRCS) soils data, etc.) would be used to guide this future delineation effort. All aquatic features delineated in the field would be recorded using Global Positioning System (GPS) with sub-meter accuracy.	PCW has designed the Rail Facility to avoid impacts to wetlands to the maximum extent practicable. Where avoidance was not feasible, PCW has designed the Rail Facility to minimize impacts. The wetlands and WUS impacted by the Rail Facility have been delineated (Appendix K). PCW will obtain a permit for the Rail Facility from USACE under Section 404 of the Clean Water Act.
A-3-92	Water – Waterbodies and Wetlands	Any construction that occurs in or adjacent to wetlands and streams would use Applicant Committed BMPs listed in Appendix A to protect surface water quality and to minimize impacts to those resources.	PCW has applied the BMPs listed in this appendix to protect surface water quality and minimize impacts to wetlands and streams.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-93	Wildlife – Department of the Interior (DOI) Wind Turbine Guidelines	Although strictly voluntary on non-federal lands, PCW will review the DOI Wind Turbine Guidelines Advisory Committee Wind Turbine Guidelines (anticipated in late summer 2010) once they are finalized with the intention of complying with them as applicable and appropriate and to the extent they do not conflict with any requirements set out by the BLM in its ROD, any agreements entered into between PCW and the USFWS, or other controlling laws, permits, or regulations.	The DOI Wind Turbine Guidelines are not applicable to the Rail Facility.
A-3-94	Wildlife – Disturbance and Harassment	All employees, contractors, and site visitors would be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. During construction, pets would not be permitted on site; during operation, pets would be controlled to avoid harassment and disturbance to wildlife.	All employees, contractors, and site visitors will receive a site orientation during which they will be instructed to avoid harassment and disturbance of wildlife.
A-3-95	Wildlife – Excavation and Blasting Activities	Explosives would be used only within specified times and at specified distances from sensitive wildlife or streams and lakes, as established by the BLM or other federal and state agencies.	PCW does not anticipate that blasting will be required for the construction, operation, maintenance, or decommissioning of the Rail Facility. If blasting is required, PCW will comply with this measure.
A-3-96	Wildlife – Habitat Restoration	In accordance with the habitat restoration plan, restoration would be undertaken as soon as practical after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.	Reclamation will be in accordance with the requirements of the Rail Facility Reclamation Plan.

TABLE 4. APPLICANT COMMITTED BEST MANAGEMENT PRACTICES (ROD TABLE D-3)

Item	Resource Concern	Measure	Implementation
A-3-97	Wildlife – Vehicle Collisions	Project personnel and contractors would be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.	All employees, contractors, and site visitors will receive a site orientation during which they will be instructed to comply with the CCSM Project rules, including adherence to speed limits.
A-3-98	Wildlife – Yellow-billed Cuckoo	Yellow-billed cuckoo habitat (i.e., riparian areas) would be avoided to the maximum extent possible.	No known yellow-billed cuckoo habitat is located within the Rail Facility Site.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
General	GEN-1	Phased Construction Sequencing. Limit surface disturbance to areas where turbines would be constructed within 12 months with a goal to mitigate impacts from surface disturbance to wildlife, soils, water, and vegetation (e.g., weeds). Four ROW grants would be issued for the project: 1) internal haul road; 2) transmission line between the two sites; 3) Sierra Madre development; and 4) Chokecherry development.	The construction schedule for the Rail Facility was developed to comply with requirement GEN-1.
	GEN-2	Off-site Compensatory Mitigation. Off-site compensatory mitigation may be considered through future consultations between the BLM, Cooperating Agencies, and PCW if mitigation measures established through the project-wide EIS are later determined to not be adequate.	PCW acknowledges that BLM, in consultation with PCW and the Cooperating Agencies, may consider off-site compensatory mitigation if the existing mitigation measures are determined not to be adequate.
Air		No additional mitigation measures proposed.	
Cultural	CR-1	To minimize unauthorized collecting of archaeological material or vandalism to known archaeological sites, PCW and its contractors, and all construction personnel, shall attend mandatory training and be educated on the significance of cultural resources and the relevant federal regulations intended to protect them.	PCW, its contractors, and all other construction personnel will attend mandatory training and be educated on the significance of cultural resources and the relevant federal regulations intended to protect them.
	CR-2	Additional mitigation measures will be included in the Programmatic Agreement, which will be developed in coordination with the BLM, SHPO, ACHP, PCW; Indian tribes; and other interested parties.	PCW acknowledges that additional mitigation measures for cultural resources are being developed under the provisions of the Programmatic Agreement for the CCSM Project.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Geology and Mineral Resources		No additional mitigation measures proposed.	
Land Use		No additional mitigation measures proposed.	
Paleontology	PALEO-1	If any vertebrate fossils or scientifically important fossils are discovered during construction operations on federal lands, the permittee shall cease activities immediately and notify the BLM so the agency can determine the significance of the discovery. The BLM shall evaluate or have evaluated such discoveries and shall notify PCW what action shall be taken with respect to such discoveries. Additionally, PCW also would contract with a qualified paleontologist approved by the BLM who shall be on call during all construction periods and available to travel to the site within 24 hours following notice of a discovery, and that the on-call paleontologist shall consult with the BLM to reach agreement on the significance of the discovery within 24 hours following arrival at the site by the on-call paleontologist. The BLM will then promptly notify PCW as to what actions shall be taken.	PCW will have a paleontologist on-call and agrees to suspend construction activities within the immediate area if fossils are discovered on federal lands for up to 48 hours while BLM evaluates the fossils' significance.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	PALEO-2	Any fossils recovered during the assessment of paleontological resources will be prepared in accordance with standard professional paleontological techniques. The fossils will be curated in a BLM-approved facility. A report on the findings and significance of the salvage program, including a list of the recovered fossils, will be prepared following completion of the program. A copy of this report will accompany the fossils, and a copy will be submitted to the Wyoming Museum, University of Wyoming.	Fossils discovered on federal lands will be curated in a BLM-approved facility. A report on the findings and significance of the salvage program, including a list of the recovered fossils, will be prepared following completion of the program. A copy of this report will accompany the fossils, and a copy will be submitted to the Wyoming Museum, University of Wyoming.
Range	RANGE-1	Coordinate construction schedules and ranching operations to allow sequencing of pasture use to the extent practicable within the Pine Grove/Bolten allotment and other affected allotments (Cottonwood Draw, Middlewood Hill, Grizzly, McCarty Canyon, and Sage Creek) in a manner to minimize conflicts between grazing and construction activities.	PCW will coordinate construction schedules related to the Rail Facility with TOTCO's ranching operations to minimize conflicts between grazing and construction activities.
Recreation		No additional mitigation measures proposed.	
Socioeconomics		No additional mitigation measures proposed.	
Soils	SOIL-1	Road fabric, or equivalent base stabilization as determined by the BLM, will be applied where roads cross sensitive soils (wet, severely erodible soils, and soils with low soil strength).	Potential methods for soil stabilization for the Rail Facility roads are discussed in the site-specific plan of development. PCW will coordinate with BLM to identify areas where soil stabilization is required.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	SOIL-2	Excess subsoil excavated from tower foundations will not be used as topsoil or spread on top of topsoil without further laboratory testing of the subsoil physical and chemical characteristics, and agency approval. PCW will identify the acceptable disposal method for excess subsoil in the final reclamation plan.	Soil handling for the construction, operation, maintenance, and decommissioning of the Rail Facility will be in accordance with the Reclamation Plan for the Rail Facility.
	SOIL-3	Areas identified as having limited reclamation potential (as defined in the Rawlins Instruction Memorandum No. WYD-03-2011-002) will be avoided during construction unless an acceptable site-specific reclamation plan is approved by the BLM.	Limited reclamation potential areas have been avoided to the extent practicable; remaining impacts will be managed in accordance with the Reclamation Plan for the Rail Facility.
	SOIL-4	To reduce impacts related to road density in the Application Area, roads that are no longer needed will be effectively reclaimed.	Roads within the CCSM Project Site that are rendered unnecessary by the Rail Facility will be effectively reclaimed.
	SOIL-5	PCW will be required to submit a snow removal plan as part of the ROW grant application. The snow removal plan will include measures to ensure protection of soil and water resources.	A winter access plan, including snow removal measures, is included in site-specific plan of development for the Rail Facility.
	SOIL-6	Drainages, vegetated sand dunes, salt flats, steep slopes, and gullied areas will be avoided for towers, laydown areas, facilities, and roads (to the extent possible). Towers, laydown areas, and other facilities will be re-located to areas of generally stable soils. These avoidances shall be taken into consideration during site specific analyses.	The Rail Facility has been designed to minimize impacts to sensitive soils to the maximum extent practicable.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Transportation	TRANS-1	To the extent that all governmental entities are willing to participate, PCW shall participate in a coordinated transportation planning process with the BLM, WYDOT, Carbon County, the Town of Sinclair and the City of Rawlins, to identify and develop measures to avoid, manage or mitigate transportation impacts of construction. The BLM shall coordinate with affected local governments to solicit input from the Sinclair Refinery, the CIG compressor station, affected grazing operators, and other major property owners (including the operator of the truck stop just north of I-80 Exit 221) in the affected area. The group shall meet prior to and during the construction phase of the project and in the initial year of project operations, as needed.	Significant transportation impacts are not anticipated from the Rail Facility; however, for the CCSM Project as a whole, PCW will participate in a coordinated transportation planning process to identify appropriate measures to avoid, manage, or mitigate transportation impacts.
	TRANS-2	PCW shall develop measures to inform and update Carbon County residents and travelers on I-80 near Sinclair and WY 71 about potential delays during peak months and especially during peak hours. In coordination with WYDOT, electronic signage shall be used near I-80 Exit 221 to encourage I-80 travelers to use alternate access to Sinclair during peak hours.	Significant transportation impacts are not anticipated from the Rail Facility; however, for the CCSM Project as a whole, PCW will coordinate with WYDOT and Carbon County to inform the public about potential travel delays that may be caused by the CCSM Project.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	TRANS-3	PCW shall coordinate with WYDOT to identify measures to control traffic and enhance traffic flows in the vicinity of I-80 Exit 221 during shift changes and at times when oversized vehicles will be crossing the bridge over I-80, and along WY 71 within the City of Rawlins if the WY 71/CR 407 (Sage Creek Road) workforce commuting option is selected.	Development of the Rail Facility will not result in substantial transportation impacts; however, for the CCSM Project as a whole, PCW will coordinate with WYDOT to identify appropriate measures to avoid, manage or mitigate transportation impacts.
	TRANS-4	PCW shall implement incentives for carpooling and/ or other workforce transportation measures to reduce traffic and congestion during shift changes.	Development of the Rail Facility will not result in substantial transportation impacts; however, for the CCSM Project as a whole, PCW will develop and implement workforce transportation measures to reduce traffic and congestion during shift changes.
Vegetation	VEG-1	Survey and mark the disturbance boundary to minimize unintentional surface disturbance. Actively monitor construction to ensure construction and staff stays within the defined limits.	PCW will mark the limits of disturbance for the Rail Facility. Construction supervisory personnel will monitor construction to ensure that activities stay within the marked limits.
	VEG-2	Salvage vegetative debris and redistribute to reclaimed surface areas in order to reduce erosion and preserve native organic material and seed sources.	Reclamation will be in accordance with the Rail Facility Reclamation Plan.
	VEG-3	In areas where excavating soil is not necessary, such as temporary laydown areas or temporary access roads, avoid disturbing native soil and root zones where possible to preserve soil structure and soil biology and improve the success for reclamation.	PCW will avoid excavation and disturbance of soil when possible.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Visual	VR-1	Monopole and H-frame transmission structures and overhead collector line structures would be treated to have a muted, darker color than conventional galvanized steel or laminated wood to reduce color contrasts. The recommended paint color for transmission structures is Shadow Gray from the BLM Standard Environmental Colors Chart CC-00 or an equivalent color. Steel pole equivalents used in the installation of the overhead electric collector lines should be finished with paint or a self-weathering finish that will harmonize with colors of the surrounding landscape (i.e., approximate the color of wood when used with wood overhead collector lines). When not used with wood poles, the recommended paint color for powerline structures is Shadow Gray from the BLM Standard Environmental Colors Chart CC-00. Conductors would have a non-reflective finish.	The Rail Facility site-specific plan of development does not include any transmission structures or overhead collector lines.
	VR-2	Place vegetative debris on cut-and-fill slopes to vary texture and color of cut-and-fills until vegetation has been re-established.	Reclamation will be in accordance with the Rail Facility Reclamation Plan.
	VR-3	Lighting for ancillary facilities shall be motion-activated and shielded downward to limit night lighting impacts beyond the site.	Lighting for ancillary facilities will be motion-activated and shielded downward. Temporary lighting that is not motion-activated may be used as needed for safety and security to supplement ancillary facility lighting for nighttime activities.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	VR-4	Audio Visual Warning System (AVWS) for aircraft detection and warning may be required to reduce day and night lighting impacts from WTGs if technologies become available that are approved by FAA, are proven reliable at the scale of CCSM, and BLM determines that systems are cost effective.	Not applicable. The Rail Facility site-specific plan of development does not include any wind turbines.
	VR-5	Substation components and fencing would be Shadow Gray from the BLM Standard Environmental Colors Chart CC-00 or a similar color in a dark gray color range. Color mitigation would not be required on facilities that are treated in accordance with safety and engineering concerns.	Not applicable. The Rail Facility site-specific plan of development does not include any substations.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Wetlands	WET-1	Conduct on-site delineations of all waters of the U.S., including wetlands and waterbodies within the Alternative Development Area prior to construction. The surveys would be performed and documented by qualified wetland scientists to determine the types and spatial extent of site-specific wetland and riparian features. Current resource mapping (e.g., USGS topographic maps, USFWS NWI maps, FEMA floodplain maps, AECOM wetland and riparian data, NRCS soils data, etc.) would be used to guide this future delineation effort. All features would be recorded using a GPS unit with sub-meter accuracy, in addition to photographic and written documentation of each feature according to standardized USACE delineation data requirements and any additional BLM data requirements. Subsequent NEPA tiering would include the site-specific waters of the U.S. delineation results.	Wetlands and waters of the U.S. within the Rail Facility Site have been delineated (Appendix K).
Water	WR-1	Stream water quality monitoring sites will be identified by the BLM. Stream monitoring shall continue through construction, operation, and decommissioning of the project by PCW to monitor for changes in water quality.	PCW and BLM have identified watershed monitoring locations for the CCSM Project in the Watershed Monitoring Plan. Data collection includes water quality. PCW will continue to collect water quality data at the watershed monitoring locations through construction, operation, maintenance and decommissioning.
	WR-2	PCW will be required to submit the site-specific SWPPP as part of the ROW grant application for approval by the BLM.	A SWPP Plan has been developed for the Rail Facility (Appendix I).

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Wildlife and Fisheries	WFM-1	Workers, with the exception of security personnel, will not be allowed to possess firearms during work activities and will attend mandatory training (provided by WGFD) on wildlife regulations and ways to reduce disturbance to wildlife.	Workers, with the exception of security personnel, are not allowed to possess firearms during work activities and will attend mandatory training (provided by WGFD) on wildlife regulations and ways to reduce disturbance to wildlife.
	WFM-2	Snow fences, if used, will be limited to segments of one-quarter mile or less. In addition, escape openings will be provided along roads, every one-quarter mile or less, to facilitate exit of big game animals from snowplowed roads.	As addressed in Appendix E, snow fences will be limited to segments of one-quarter mile or less and escape openings for animals will be provided along snow-plowed roads every one-quarter mile or less.
	WFM-3	If measured bat mortality is determined to be above levels of concern for the project (as presented in section 4.14 of the EIS), measures appropriate to avoid, minimize, and mitigate impacts to bat species will be identified in the Bat Protection Plan for the Project. Thresholds of impacts to bats and appropriate responses to exceeding such impact thresholds will be determined by BLM in coordination with the WGFD, and if appropriate, the USFWS, as part of the conservation, avoidance, minimization and mitigation measures identified in the Bat Protection Plan.	Bat mortality is not anticipated to be an issue for the Rail Facility.
	WFM-4	Instream construction (stream crossings and stream construction activities) will occur during the low flow period (July 15 to September 30).	The construction schedule for the Rail Facility provides for installation of the Little Sage Creek and Miller Creek crossings during the low flow period. Other live stream crossings have been scheduled to occur during the low flow period to the extent practicable

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
Special Status Species	SSS-1	Prior to construction activities in suitable pygmy rabbit habitat, presence/absence surveys would be conducted following appropriate protocols. Areas within 0.25 mile of proposed disturbance that show characteristics of pygmy rabbit habitat will be surveyed in accordance with the Interagency Pygmy Rabbit Working Group Survey Protocols (Ulmschneider et al. 2004). If the surveys conclude that the pygmy rabbits occur, the "Habitat Preservation and Restoration" conservation measures will apply (Keinath and McGee 2004).	Wildlife surveys were completed for the Rail Facility (Appendix N). The Rail Facility will affect one pygmy rabbit occurrence and the associated suitable habitat. PCW will apply the "Habitat Preservation and Restoration" conservation measures at this location, as applicable.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	SSS-2	Prior to construction activities in suitable Wyoming pocket gopher habitat, presence/absence surveys will be conducted following appropriate protocols. If active Wyoming pocket gopher mounds are identified by the presence/absence survey, the proposed surface disturbing activities will avoid the active pocket gopher mounds by 75 m (BLM 2009f). However, if PCW does not wish to avoid the active pocket gopher mounds by 75 m, classification surveys (via live capture) must be completed to identify the pocket gopher to the species level responsible for the mounds. If the results conclude that the Wyoming pocket gopher is responsible for the mounds, the “Occupied Wyoming Pocket Gopher Habitat Protection Measures” will apply (BLM 2009f). If the results conclude that the associated species is a Northern pocket gopher, then the proposed surface disturbance may proceed without mitigation. If the classification survey fails to conclusively identify the associated pocket gopher to the species level, then it will be assumed that the species is a Wyoming pocket gopher and the “Occupied Wyoming Pocket Gopher Habitat Protection Measures” will apply (BLM 2009f).	Wildlife surveys were completed for the Rail Facility Site (Appendix N). Thirty-three Wyoming or unknown pocket gopher mounds/ mound complexes were located within 75 meters of the Rail Facility disturbance area. PCW will apply the "Occupied Wyoming Pocket Gopher Habitat Protection Measures" at these locations, as applicable.

TABLE 5. PROPOSED MITIGATION MEASURES (ROD APPENDIX D-4)

Resource	Code	Proposed Mitigation Measure	Implementation
	SSS-3	To protect potential mountain plover habitat, prior to any surface disturbance, a presence/absence survey for active mountain plover nests will be conducted in all potential habitat within the area proposed for surface disturbance. Surveys are to be performed by a wildlife biologist familiar with mountain plover and their associated habitat. If evidence of mountain plovers is found during the preconstruction survey, then additional stipulations may apply (BLM 2009a).	Potential mountain plover habitat is present in the Rail Facility Site. If surface disturbing activities are proposed in potential mountain plover habitat on federal lands during the mountain plover nesting period, pre-construction presence/absence surveys will be conducted.
Noise	N-1	USEPA guidance stipulates the threshold for residential noise impacts resulting from construction activities, including blasting, is reached at 55 dB(A) at 1,600 feet (USEPA 1974). When a residence is within 1,600 feet of construction activities, construction activities exceeding 55 dB(A) would only be allowed to occur between the hours of 7 a.m. and 10 p.m., and on weekdays.	PCW will schedule construction activities with noise exceeding 55 dB(A) within 1,600 feet of occupied residences to occur on weekdays between 7 a.m. and 10 p.m.
	N-2	Whenever feasible, multiple construction activities (e.g., blasting and earthmoving) shall be scheduled to occur concurrently to minimize the length of time residences within 1,600 feet may be affected.	PCW will schedule multiple construction activities within 1,600 feet of occupied residences to occur concurrently whenever feasible.

APPENDIX B

See Attached CD

APPENDIX C

Chokecherry and Sierra Madre Wind Energy Project

Road Design Manual

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and Federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the Federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on Federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

A common element in each site-specific plan of development is establishment of the roads necessary to access each CCSM Project component. Roads are a critical element of the CCSM Project; therefore, PCW has created this Road Design Manual (Manual) to provide a single

reference on the design features and requirements of the CCSM Project Roads. All roads constructed for the CCSM Project will meet the applicable requirements of the BLM Gold Book (BLM 2007), BLM Manual 9112: Bridges and Major Culverts (BLM 2009), and BLM Manual 9113: Roads (BLM 1985; BLM 2011).

2.0 ROAD DESIGN REQUIREMENTS

PCW developed design criteria for the CCSM Project roads based on BLM design guidance and the CCSM Project requirements. PCW used the BLM road classifications as the starting basis for the CCSM Project's road classifications, but tailored each CCSM Project road classification to meet the specific needs of the project. **Error! Reference source not found.** summarizes the final design criteria established for each CCSM Project road class.

2.1 BLM ROAD DESIGN GUIDANCE

PCW initially consulted the BLM Gold Book (BLM 2007) and BLM Manual 9113 (BLM 1985; BLM 2011) for guidance on road design on federal lands. The BLM Gold Book is specifically designed for use in oil and gas development; however, it does provide additional guidance and clarification. Together the BLM manuals establish guidance for three primary classes of roads on federal lands. The road classes established by BLM in the guidance are as follows:

- **BLM Collector Roads:** double lane roads with a travelway of 20 to 24 feet serving large land areas. BLM collector roads are designed to be major access routes into major development areas.

- **BLM Local Roads:** single or double lane roads with a travelway of 12 to 24 feet (travelway minimum width is 24 feet for double lane roads) providing access to large areas and for various uses. BLM local roads connect collect traffic from BLM resource roads.

- **BLM Resource Roads:** low volume, single lane roads with a travelway of 12 to 14 feet (preferred travelway width is 14 feet) connected to terminal facilities such as wells.

Table 1. Road Design Parameters

Design Criteria		Haul Road	Arterial Road	Turbine and Facility Roads	Structure Road
BLM Classification Basis		Collector Road	Local Road	Resource Road	Resource Road
Preferred Design Speed[1]		40 mph	20 mph	20 mph	20 mph
Road Width - Permanent		40 feet	24 feet	16 feet	12 feet
Temporary Shoulder Width (both sides) – Construction Stage Only		N/A	6 feet (12 feet total)	10 feet (20 feet total)	0
Tangent Length Between Hor. Curves (min)		140 feet	140 feet	140 feet	N/A
Design Road Profile Grades		0%(min) 10% (max)	0%(min) 16% (max)	0%(min) 16% (max)	0%(min) 16% (max)[2]
Culvert/Water Crossing Design (storm event)		10-25 year	10-25 year	10 year	10 year
Allowable Deflection		6 inches in 50 feet	6 inches in 50 feet	6 inches in 50 feet	N/A
Horizontal Curves (Centerline) (min)		750 feet	300 feet	150 feet	50 feet
Intersection Turning Radius (Edge of Traveled way) (min)		135 feet	135 feet	135 feet	N/A
Tangent Length Between Vertical Curves (min)		100 feet	50 feet	50 feet	0 feet
Vertical Curve Length (min)		100 feet	50 feet	50 feet	25 feet
K-Value (min)	Crest	30	20	12.5	12.5
	Sag	30	20	12.5	12.5
Roadway crown		1% (min) 3% (max)	1% (min) 3% (max)	1%	3%
Roadway cross slope (continuous)		1% (min) 3% (max)	1% (min) 3% (max)	1%	3%
Roadway cross slope (superelevations) (max)		6%	6%	N/A	N/A

[1]The design speeds were adjusted in some locations to accommodate the requirements of crane travel. PCW will post reduced speed limits where necessary.
[2]Locations that exceed the design maximum grade are indicated on the Issued for Permit Plans
max maximum
min minimum
mph miles per hour
N/A not applicable

2.2 CCSM PROJECT REQUIREMENTS

The access roads throughout the CCSM Project Site can be broken down into five general classifications based on the types of traffic and the frequency of use expected. PCW used the BLM road classes as a starting point to develop the design criteria for each CCSM Project road classification. Design criteria were finalized based on anticipated traffic volumes and the CCSM Project load types and schedule requirements. While each road classification has a design speed, as indicated below, in some instances the design speeds may not be achievable due to conflicting design requirements (e.g. due to allowances for both vehicle and crane travel). Appropriate speed limits for each road will be established based on the actual design speed achieved.

1. **Haul Roads:** [*Based on BLM Collector Roads*] Haul class roads are the primary heavy haul routes throughout the CCSM Project, connecting the rail facility, quarry, and laydown yards with the wind development areas. These roads must accommodate 40 mph traffic while allowing for two-way truck passing due to the expected traffic volumes and overall construction schedule requirements.
2. **Arterial Roads:** [*Based on BLM Local Roads*] These roads provide access from haul class roads into wind development areas. Two-way truck traffic is still required; however, the passing speed can be greatly reduced. Overall, arterial roads still have a minimum design speed requirement of 20 mph to accommodate the traffic levels associated with the CCSM Project construction schedule. Arterial roads must also accommodate crane travel and compacted shoulders are planned to achieve adequate width.
3. **Turbine and Facility Roads:** [*Based on BLM Resource Roads*] Any turbines or facilities not directly on the haul or arterial-class roads still require an all-weather access road. The turbine and facility class roads must accommodate turbine component deliveries and significant traffic volumes over short durations. As most of these roads will provide access to wind turbines, they must also be designed to accommodate crane travel using compacted shoulders to achieve adequate width. These roads are designed to allow for two-way pick-up truck traffic at 20 mph; for large delivery trucks, however, passing may require turn-outs in complex terrain.
4. **Structure Roads:** [*Based on BLM Resource Roads*] The construction of the CCSM Project electrical system structures (overhead transmission and select collection line structures) requires access roads for the delivery of large components, assembly of these components using a rough-terrain crane, and all-weather access during operations. While structure class roads are also based on BLM resource roads, there are no minimum speeds required; therefore, structure class roads can be narrower than turbine and facility class roads.
5. **Unimproved Access Routes:** A few elements of the CCSM Project (notably the overhead collection line poles) require construction access by light duty vehicles and infrequent access during operations. For these elements, PCW will endeavor to use existing ranch two-track roads as-is or with minimal improvement. Where two-track roads do not exist and topography, soil, and vegetation conditions allow, PCW may establish unimproved vehicle access routes. These unimproved access routes will be

clearly marked using t-posts to contain activity within the route; however, no vegetation will be removed and grading will not be performed. If site conditions do not allow for an unimproved access route, PCW will build structure roads instead.

2.3 FINAL DESIGN CRITERIA

The following sections describe each road classification in more detail, including how the BLM road guidance was adjusted to meet the specific needs of the CCSM Project.

2.3.1 Haul Roads

Haul roads are designed to allow for two-way semi-truck traffic and to safely accommodate high traffic volumes. PCW utilized the BLM Collector Road designation as the basis of the haul road classification. However, due to the CCSM Project-specific traffic types and volumes, PCW determined it was necessary to expand the driving surface width from 24 feet to 40 feet. Specifically this expanded width is required to meet the high traffic volume and to allow for two-way passing of superload component delivery trucks at the design speed of 40 mph while maintaining acceptable levels of safety. The 8 foot shoulders on each side of the travelway, along with 4:1 safety slopes, create the recovery zone for vehicles that leave the travelway as defined by the AASHTO Roadside Design Guide and WyDOT Road Design Manual (Section 3-02 Cross Sectional Elements). Without the 8 foot shoulders more disturbance would be needed from the edge of the road to the back slope of the ditch to provide an equal recovery zone. The increased overall width of the haul roads allows disabled vehicles to stop off the travelway and two way traffic to safely pass the disabled vehicle at a reduced speed. Similarly, due to the high volume of traffic on haul roads, increased maintenance (watering for dust control and blading of aggregate surfacing) of the haul road will be required and the wider overall road width will allow traffic to pass maintenance activities more safely.

Figure 1 shows examples of wind energy project haul roads similar to the CCSM Project haul class roads.

Figure 1. Example Wind Energy Project Haul Roads

2.3.2 Arterial Roads

The purpose of the arterial class roads is to provide access to large areas of turbines. This purpose aligns well with the purpose of the BLM local roads; therefore, PCW based the design of the arterial roads on the BLM local road specifications. The aggregate driving surface width of the arterial roads was set to 24 feet to match the preferred double lane travelway width specified in BLM Manual 9113 (BLM 1985; BLM 2011) for the collector-class roads. In addition to the aggregate driving surface, PCW will install temporary shoulders out of compacted native material for road segments where crane travel is required. Following construction of the CCSM Project, the temporary shoulders will be reclaimed.

2.3.3 Turbine and Facility Roads

Based on the relatively short period in which turbine and facility roads will see high traffic followed by years of lower traffic levels, PCW elected to base the design of these roads on the BLM resource roads. This classification allows for more flexibility to traverse complex terrain by utilizing steeper slopes and tighter turns; however, to align with turbine manufacturer transportation specifications for component deliveries, PCW increased the aggregate driving surface width to 16 feet. As with the arterial roads, in addition to the aggregate driving surface, PCW will install temporary shoulders out of compacted native material as needed to accommodate crane travel and safe two-way passage for construction vehicles. At the conclusion of CCSM Project construction, the compacted shoulders will be reclaimed.

2.3.4 Structure Roads

Structure class roads have been designed based on the BLM resource roads. Structure roads are required to construct the transmission line structures and provide access to the structures for maintenance. Traffic estimates during construction are expected to be high only when construction of the structure is occurring and minimal at other times during construction and operations. Structure class road horizontal designs attempt to minimize effects to drainages, slopes, and highly vegetated areas while also minimizing the overall disturbance footprint. The vertical design of structure class roads generally follows the existing terrain with earthwork required only to grade localized highpoints and low points. A 12 foot road surface width was selected for structure class roads to meet the requirements of construction and operations traffic and minimize the long term disturbance of the roads. Where practicable, structure class roads were routed on existing unimproved ranch roads or other previously disturbed areas. Large track crane travel is not anticipated along these roads so temporary crane shoulders are not required for structure class roads.

2.3.5 Unimproved Access Routes

Unimproved access routes are not intended to be improved and thus do not have specific design criteria or design elements. Unimproved access routes were selected to use existing roads or where cross-country travel is required to avoid steep slopes (16% or more) and drainages. Unimproved access routes will ideally use ground with an existing grade of 16% or less; however, some routes may exceed this grade in localized areas (e.g. existing roads or other

disturbed areas). Where cross-country travel is required, a 12 foot wide path will be marked to contain vehicles.

3.0 ROAD DESIGN ELEMENTS

In addition to the road design requirements described above, the primary design elements for all classes of roads are the structural section, alignment, and drainage crossings. The haul road class is the most robust since it will have highest volume of traffic and design speed. The arterial, turbine and facility, and structure roads will be proportionally less based on the volumes of traffic and anticipated use of each road class.

3.1 STRUCTURAL SECTION

The structural section of the road is the design of the material layers that make up the road, including the surface and all supporting layers underneath it. The elements of the structural section are listed below and a typical structural section is shown in Figure 2:

- Aggregate cap - provides driving surface and drainage
- Aggregate base - provides additional strength, stability, and weight distribution
- Lower aggregate base (if needed) - provides additional stability
- Geosynthetic material, such as geotextile fabric or geogrid (if needed) - provides additional stability
- Subgrade/subbase - provides road base in existing soils

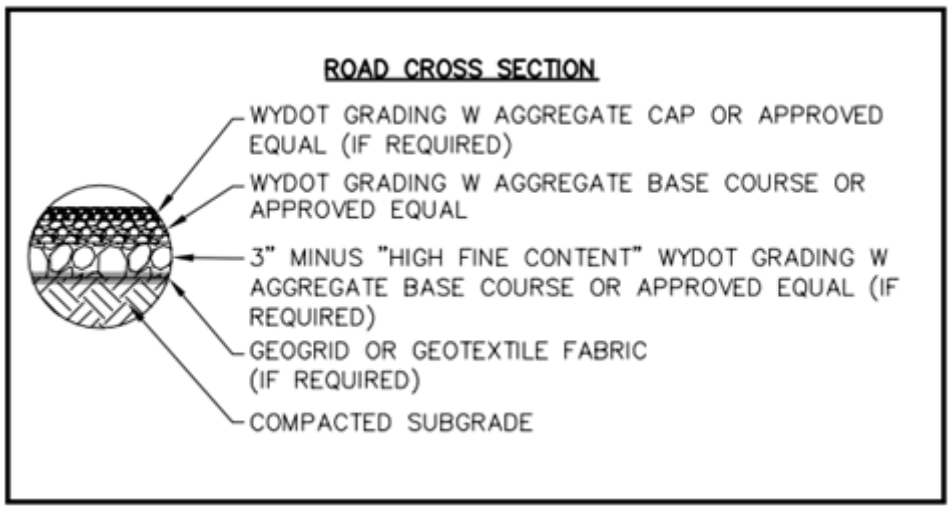


Figure 2. Typical Road Structural Section

The primary factors that impact the design of the structural section of a road are the properties of the existing soil and the anticipated use of the road. PCW has completed geotechnical investigations for the CCSM Project to identify the soil classes (as defined by the Unified Soil Classification System), as well as laboratory investigations to characterize soil (e.g. California Bearing Ratio (CBR), a measure of the compactibility). PCW has also identified the anticipated

use of each class of road, as described in Section 2.0. Based on the results of this analysis, PCW determined that the CCSM Project roads are expected to achieve sufficient subgrade compaction without requiring additional stabilization from geotextile fabric or geogrid. PCW also determined that the combined aggregate base and cap thicknesses required for haul and arterial class roads is at least 8 inches, and at least 4 inches for turbine and facility class roads.

During construction of roads, the compaction of the road base will be tested frequently (approximately every 500 feet). If PCW determines that the design compaction has not been achieved, PCW will determine the appropriate solution. The design solutions chosen by PCW may include the following, as appropriate to the specific conditions:

- **Aggregate:** The application of additional aggregate is the most common solution to compaction problems, especially if the achieved CBR values are close to the design requirements. The engineer will specify the additional aggregate thickness required.
- **Geosynthetic (geotextile fabric or geogrid):** The use of geosynthetics is a common design solution for short lengths of road. Geosynthetics are placed over a road subgrade followed by an aggregate base.
- **Subbase replacement:** When design strength cannot be achieved using any other stabilization methods, soft subsoils are excavated and replaced with more suitable fill.
- **Placement of surge material:** When localized soft spots that cannot reach the specified compaction are encountered, some of the soft subsoil is removed and large rock, roughly 3-6 inches in diameter is driven into the ground to provide additional stabilization.

3.2 ALIGNMENT

The alignment of the CCSM Project roads is designed to balance engineering design requirements with constructability and environmental resource considerations. The roads have been aligned to avoid cultural and biological resources to the extent possible, to minimize impacts to drainage patterns, and to comply with other applicable constraints and setbacks defined in the ROD. Where possible, given these constraints, road alignments are designed to follow existing two-track roads to minimize overall disturbance.

3.3 DRAINAGE CROSSINGS

While the CCSM Project roads have been designed to minimize drainage crossings and avoid disturbing existing drainage patterns, it is necessary for the roads to cross natural drainage channels and streams in a number of locations throughout the CCSM Project Site. Where drainage crossings were deemed necessary, each crossing was reviewed to identify the location that would minimize disturbance and impacts to drainage patterns.

3.3.1 Hydrology

The CCSM Project is located within a semi-arid region of Wyoming, receiving approximately 10 inches of precipitation per year. While there are variations in elevation, soil, and rainfall across the CCSM Project Site, the watersheds are generally rather homogeneous from a hydrology

perspective. The watershed size is the largest variation within the CCSM Project Site, ranging from as little as 1 acre to over 60 square miles.

Hydrology in the vicinity of the CCSM Project Site is typically dominated by snowmelt conditions during the springtime; however, moderate rainfall events can occur during the spring and summer that generally exceed the peak runoff generated by snowmelt. Snowmelt typically generates long duration runoff events with low to moderate runoff rates. Moderate to large rainfall events typically generate shorter runoff durations, but higher peak flows. Therefore, from an engineering perspective, because the rainfall events have higher runoff rates, they "control" in terms of design. In order to conservatively estimate peak runoffs, published rainfall events were used to model the CCSM Project Site hydrology.

The BLM Road Design Handbook (BLM 2011) states the following:

> *"Culverts are to be designed using the appropriate hydraulic design procedures. Refer to AASHTO "Highway Drainage Guidelines" and State highway agencies for guidance. In addition, other publications are available from FHWA. Use any of the standard hydrologic and hydraulic design methods, but use a second method as a check to ensure that the solution is adequate but not extravagant. Special consideration may be necessary for debris passage."*

PCW used the Wyoming Department of Transportation (WyDOT) and Federal Highway Administration (FHWA) hydraulic design procedures, which are considered industry standards. For hydrologic design, PCW used the Soil Conservation Service (SCS) Curve Number method for smaller watersheds (under approximately 1 square mile) and the United States Geological Survey (USGS) Regression Equations for larger watersheds.

The SCS Curve Number method requires delineation of each small watershed based on existing topography and runoff patterns. Figure 3 shows how a watershed is delineated for a proposed culvert crossing. The SCS Curve Number method uses the following characteristics to evaluate each watershed:

- Watershed area – geographical footprint of the watershed being studied
- Topography – flow path steepness
- Soil type – capacity of soil to infiltrate water
- Precipitation – rainfall depth and intensity
- Design storm event – a less frequent storm event produces a higher rainfall amount
- Land cover – capacity of plants to absorb runoff

Typically for large watersheds over approximately 1 square mile, the USGS regression equations are used to determine peak flows for various storm events. The regression equation is a statistical analysis of other similar watersheds whose runoff discharges have been measured over many years and many rainfall events. That data is reduced down to an equation that uses a limited set of watershed characteristics, such as the watershed area and slope, to calculate the peak discharge for a given storm event. Several different regression equations have been

developed for the region of Wyoming where the CCSM Project is located. Consistent with WyDOT recommendations, PCW used engineering judgment to choose the equation that best represents the site conditions, more specifically, the equations used are from USGS report "Peak-Flow Characteristics of Wyoming Streams, Water-Resources Investigations Report 03-4107" (USGS 2003).

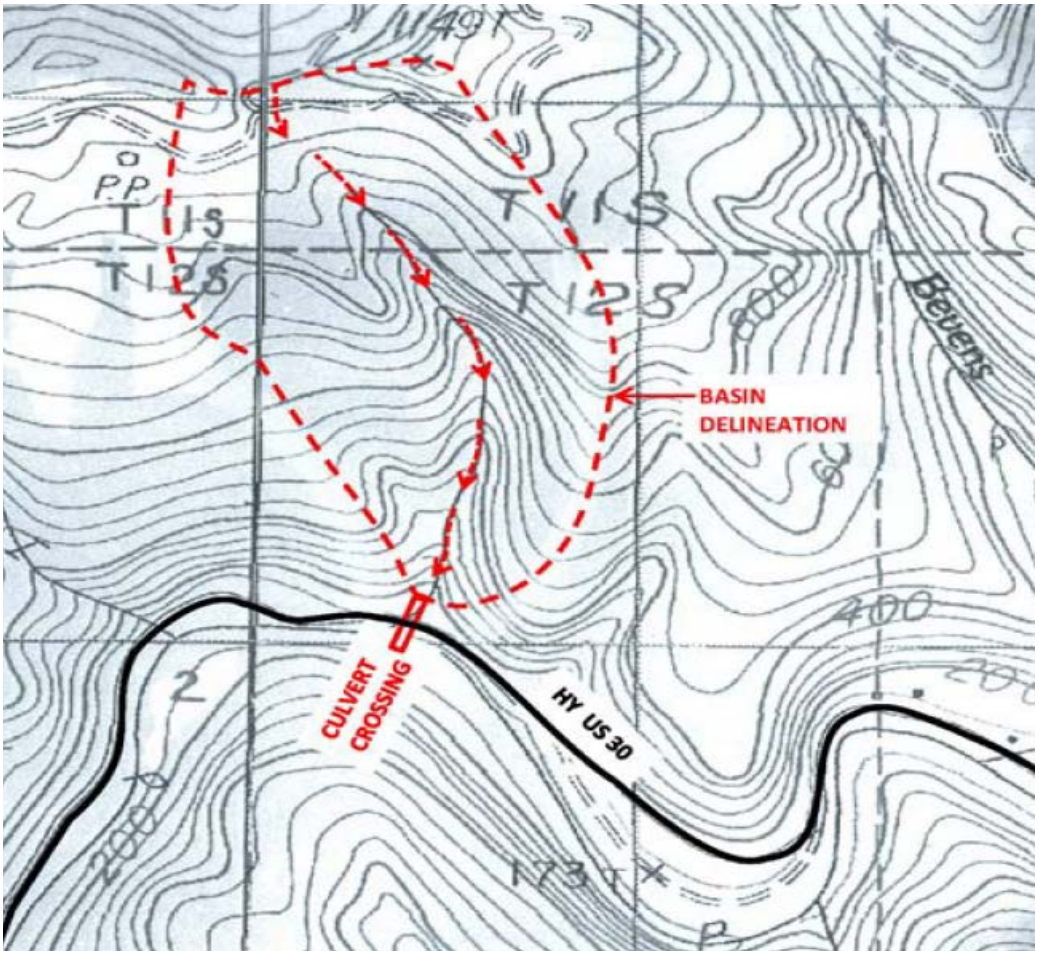


Figure 3. Example Watershed Delineation

3.3.2 Design Storm Event

The CCSM Project haul and arterial class roads are designed to provide access throughout the CCSM Project under various weather conditions. Culverts (round, box, or arch) are used as appropriate on the haul and arterial roads where water crossings occur. These culverts are typically designed for a storm event of between 10 and 25 years, with most culverts designed for a 25-year storm event (approximately 2.1 inches over a 24-hour period). This ensures that the road is not overtopped during most rainfall events. Roads throughout the United States with similar hydrologic design parameters include county roads and low volume state highways.

Drainage crossings on turbine and facility and structure class roads are designed for a lesser storm event due to the lower volumes of traffic and flexibility regarding access. Based on BLM guidance, a minimum 10-year storm event has been used for the project. Culverts will still be used at crossing locations within larger watersheds and where the road design and existing terrain require it; however, at-grade low water crossings (described in the sections below) will be used where watersheds are smaller and the road design and terrain allow for it

3.3.3 Hydraulics

There are multiple drainage crossings and structures associated with the CCSM Project roads. These drainages, crossings, and structures can generally be organized into four crossing types:

- Stream and larger drainage crossings - watersheds greater than 30 square miles, typically crossed with round, box, or open-bottomed arch culverts
- Moderate drainage crossings - watersheds between 3 square miles and 30 square miles, typically crossed with round or box culverts
- Small drainage crossings - watersheds less than 3 square miles, typically crossed at-grade or with a round culvert
- Relief culverts - allow water to flow from one side of a road to the other to follow terrain, typically round culverts

3.3.3.1 Stream and Larger Drainage Crossings

According to BLM's Engineering Manual (BLM 2008), culvert crossings are classified as "major culverts" if they have a design cross sectional area greater than 35 square feet on a 25-year storm event. Hydraulic designs for these crossings must meet the requirements of section ".22-A-3-a" of BLM's Manual 9112 (BLM 2009) which states:

> *"The minimum design flood for permanent bridges is the 50-year flood. At a minimum, major culverts in permanent installations should be designed to pass a 25-year flood with zero head above the pipe and 50-year flood with head above the pipe limited to one-half the rise (or diameter) of the pipe, but not less than 2 feet below the finished travelway shoulder."*

Based upon these requirements, PCW analyzed several types of crossings for the stream and larger drainage crossings. The first type of crossing selected was one or more corrugated metal pipe (CMP) culverts, the most common form of drainage crossings used on rural roads similar to the CCSM Project roads. Box culverts were also reviewed and selected at crossing locations that convey large volumes of water and have height and/or width restrictions within the channel that prevent the usage of multiple large diameter CMP culverts.

BLM expressed a preference for "live bottom" crossing options of Little Sage Creek and Miller Creek, both perennial streams at the crossing locations. PCW evaluated multiple "live bottom" options including traditional bridges, steel arch culverts, and reinforced concrete arch structures. All these options allow for a natural streambed to be maintained. To further develop an optimal solution, PCW evaluated the impacts of each crossing type during construction. All crossing types require diverting water through a temporary culvert while construction is occurring;

however, a prefabricated concrete arch minimizes the duration of construction and the time that the streams would be impacted. PCW chose the prefabricated concrete arch design due to the lower overall cost and reduced duration of construction. Figure 4 shows typical concrete arch structure designs.

Figure 4. Example Perennial Stream Crossing Pre-Cast Concrete Arches

3.3.3.2 Moderate Drainage Crossings

For most moderate drainage crossings for haul and arterial class roads, PCW is using CMP round culverts (Figure 5).CMP culvert sizes typically range from 60 inches to 84 inches in diameter. In a few select locations, PCW is using two or three CMP culverts in parallel to provide adequate drainage. In locations with higher road grade, lower profile CMP culverts were deemed most appropriate.

At six moderate drainage crossings along the northern portion of the Phase I Haul Road, the drainage requirements caused PCW to select concrete box culverts (Figure 6) over CMP culverts. These were selected in areas with wide drainages where round culverts may not have sufficient discharge rates and could increase the potential for ponding.

Figure 5. Example CMP Culvert Crossing

Figure 6. Example Concrete Box Culvert Crossing

3.3.3.3 Small Drainage Crossings

PCW will use round CMP culverts for small drainage crossings on haul and arterial class roads. Round culverts or at-grade low water crossings ("LWC" also referred to as "Arizona crossings") will be used throughout the CCSM Project Site on turbine and facility class roads at crossing locations with low flows. CMP culvert sizes range from 24 inches to 72 inches in diameter with the vast majority being 36 inches or less

A LWC is an at-grade designed low point in the roadway that matches the elevation of the existing drainage channel as closely as possible, and allows storm water to drain across the road surface (Figure 7, Figure 8, and Figure 9). This type of crossing is also effective in minimizing the erosion potential when crossing undefined drainage ways as it prevents channelizing the

flows through culverts. Channelizing flow in undefined drainages can increase the velocities and erosion potential across existing vegetation and soils that are not naturally accustomed.

Typical LWCs consist of aggregate surfaces with aggregate sizes large enough to support the water velocity without washing (typically 3 to 6-inch diameter). At crossings where the water velocity is too fast for an aggregate surface, a concrete surfaced LWC may be installed. PCW will determine where concrete surfaces are warranted based on site conditions encountered during construction, such as the subgrade soil conditions and the ability to achieve proper compaction. At crossings where runoff from snow melt or other drainage becomes a nuisance or increases the amount of road maintenance required, PCW may decide to install a small culvert (typically 4-6 inches). The culvert will allow small amounts of water to drain under the road keeping the road surface in a better driving condition. If PCW decides to install the culverts, the culverts will be installed at the end of CCSM Project construction once the majority of the heavy hauling is complete.

LWCs will typically be constructed to the full width of the driving surface, or the width required for cranes if the road is to be used for crane travel (refer to **Error! Reference source not found.**). The crane travel shoulders may be constructed out of a more coarsely graded aggregate that will support and distribute the weight of the cranes more effectively. Once CCSM Project construction is complete, these shoulders will be reclaimed, leaving behind the permanent roadway surface width. If the existing soils are suitable to support crane travel, PCW may choose not to install the aggregate for the crane shoulders.

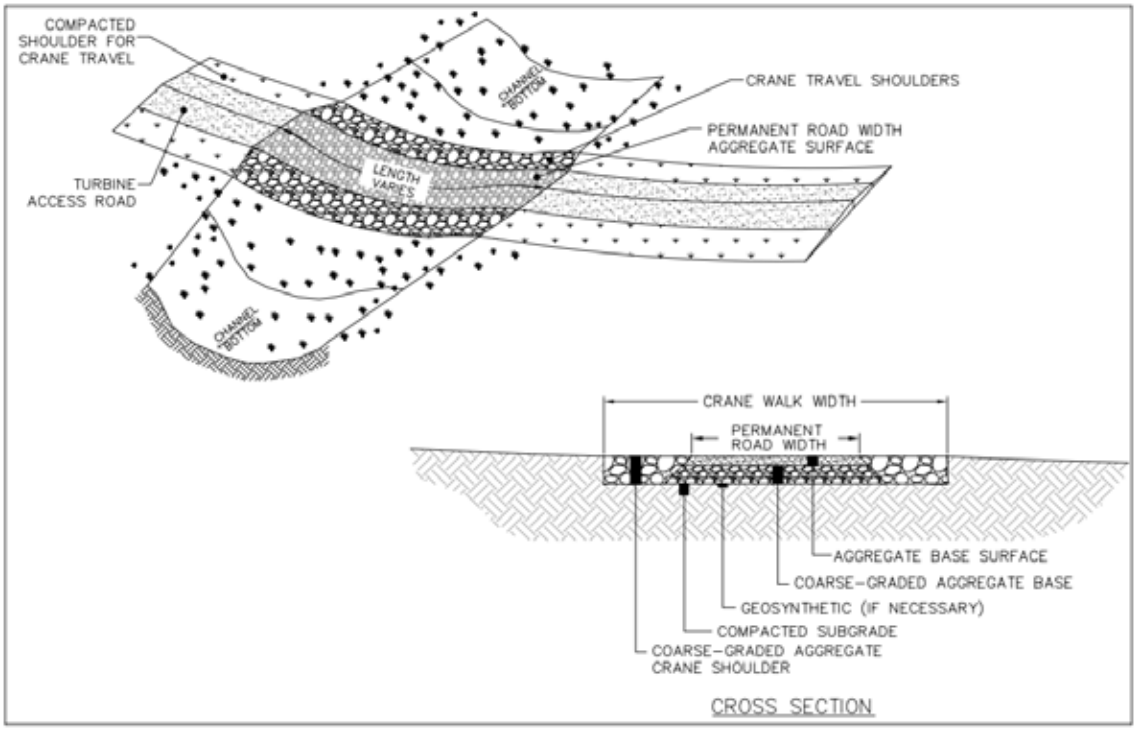


Figure 7. Typical At-Grade Low Water Crossing

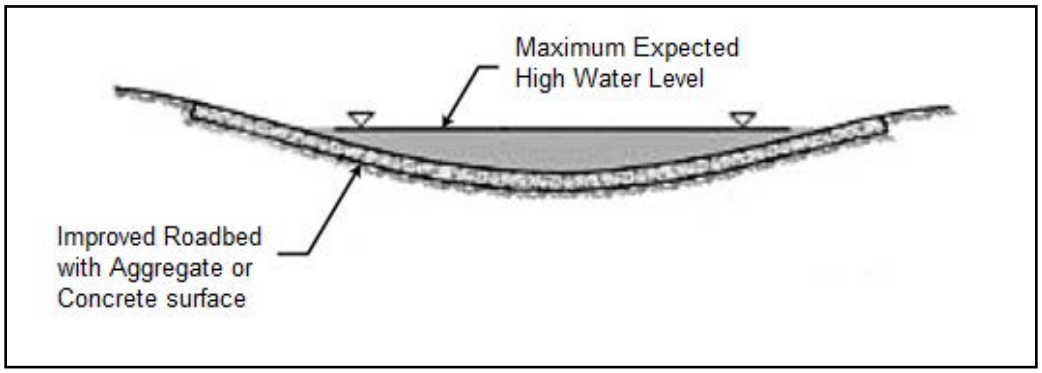


Figure 8. Diagram of At-Grade Low Water Crossing

Figure 9. Examples of At-Grade Low Water Crossings

3.3.3.4 Culvert Placement

All culverts will be placed in a manner that best matches the stream and watercourse morphology, both horizontally and vertically. Horizontally, the culverts will be placed in a manner that closely matches the watercourse orientation (see Figure 10). Vertically, the culvert will match the natural grade of the watercourse when possible (see Figure 11). Where grading is required, the culvert will be placed so there is enough room for runoff to be properly conveyed through the culvert (see Figure 12).

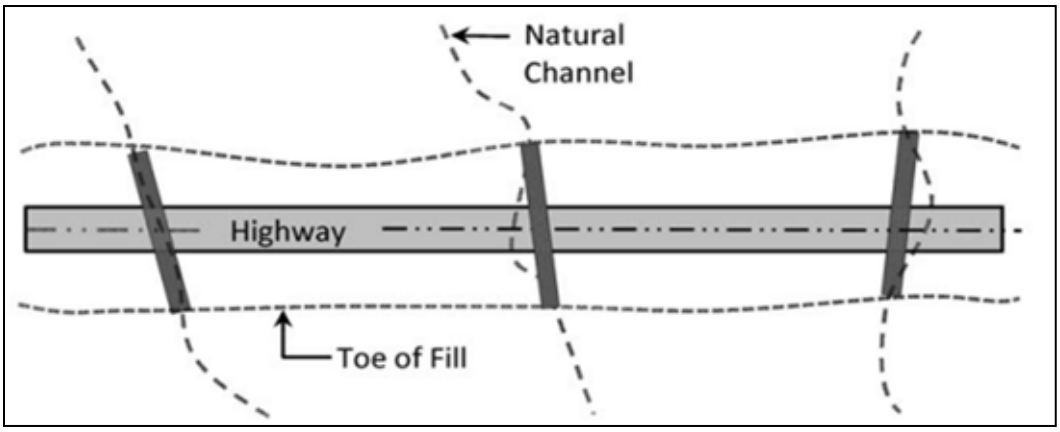


Figure 10. Typical Horizontal Culvert Placement

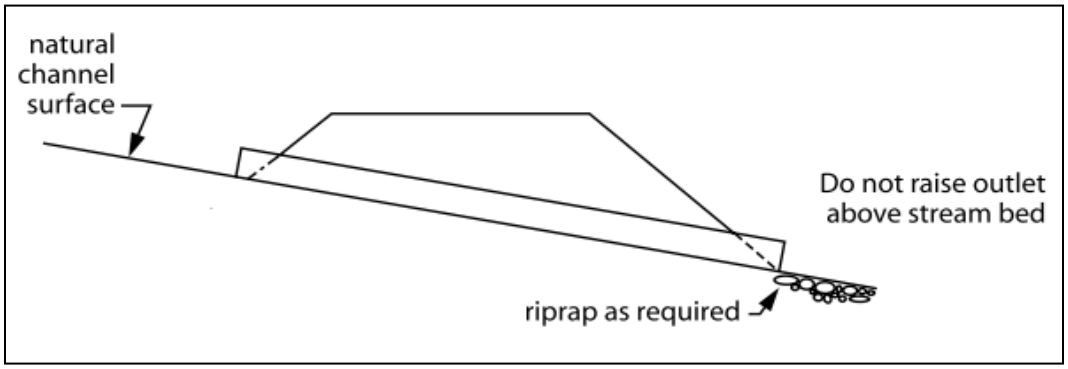


Figure 11. Typical Vertical Culvert Placement in Natural Watercourse

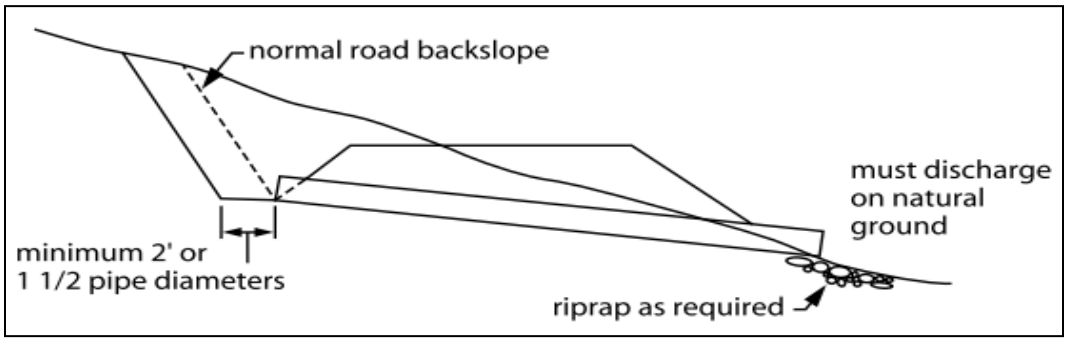


Figure 12. Typical Vertical Culvert Placement with Grading

3.3.4 Drainage Structure Structural Design

All drainage structures will be designed to accommodate the construction and operation traffic that is anticipated to drive on the road surface. The minimum structural design loading for all drainage structures must meet the requirements of section ".1-A-2" of BLM's Bridge Design Manual (BLM 2009) which states:

> *"The minimum design vehicular loading for road crossing structures designed in accordance with the AASHTO LFRD Bridge Design Specifications is load designation HL-93 and for those structures designed in accordance with the Standard Specifications for Highway Bridges, 17th Edition is load class designation HS20."*

The structural design of all drainage structures takes into account any crane travel on the road surface or special delivery truck requirements based on standard wind farm construction practices. If needed to accommodate construction traffic loadings, drainage structures will have increased fill, timber mats, steel plates, or other protection measures for temporary construction loadings that exceed the design capacity of the drainage structure.

3.3.5 Drainage Structure Scour Design

The CCSM Project requires culvert crossings at drainages throughout the CCSM Project Site. The majority of the proposed culvert crossings are classified for scour design as *minor* culverts, with cross-sectional areas less than 35 square feet. Minor culverts include those previously defined in this document as relief or small culverts. The BLM defines the remainder of the culverts (cross-sectional areas greater than 35 square feet) as *major* culverts, those previously defined as moderate or stream crossings.

Measures will be taken to protect the soil around the culvert inlets from erosion, following the BLM Gold Book guidelines (BLM 2007). BLM Manual 9113 indicates that scour should be considered when designing culverts, but doesn't specify a procedure for design. Therefore, minor culvert outlets will be protected from scour using standard WyDOT and FHWA guidelines for outlet aprons. Major culverts will be protected against scour by using BLM, WyDOT and FHWA guidelines and calculations from HEC-14. The Federal Highway Administration publishes HEC-14 as part of its Hydrologic Engineering Center standard publications.

Riprap will be used as the primary means to prevent culvert erosion. However, if PCW determines it is necessary, additional commercially available erosion control products may be used on a limited basis to supplement or replace riprap as a means to protect existing soils around culverts.

3.3.5.1 Minor Culverts

The FHWA and multiple DOTs throughout the country have developed standard details for riprap placement to prevent erosion and scour. These guidelines are based on research and calculations in HEC-14. These outlet protection details are suitable for culverts up to

approximately 72" diameter. The BLM Gold Book further specifies how to place riprap to protect culvert inlets.

The CCSM Project will use the BLM and FHWA guidelines for the minor culverts throughout the project site. Figure 13 gives an example showing how inlet and outlet protection is achieved for a variety of culvert sizes. Figure 14 shows a typical triangular outlet apron. The width is generally around 20 percent wider than the length.

3.3.5.2 Major Cuvlerts

Outlet protection for the CCSM Project's major culverts will be calculated and designed on an individual basis using HEC-14. The procedures in HEC-14 provide design information for analyzing and mitigating energy dissipation problems at culvert outlets and in open channels. The riprap D_{50} size and apron dimensions are calculated based on the culvert's shape, dimensions, design discharge, and tailwater elevation. The outlet protection design intent will be similar to the minor culverts as shown in Figure 13 and Figure 14.

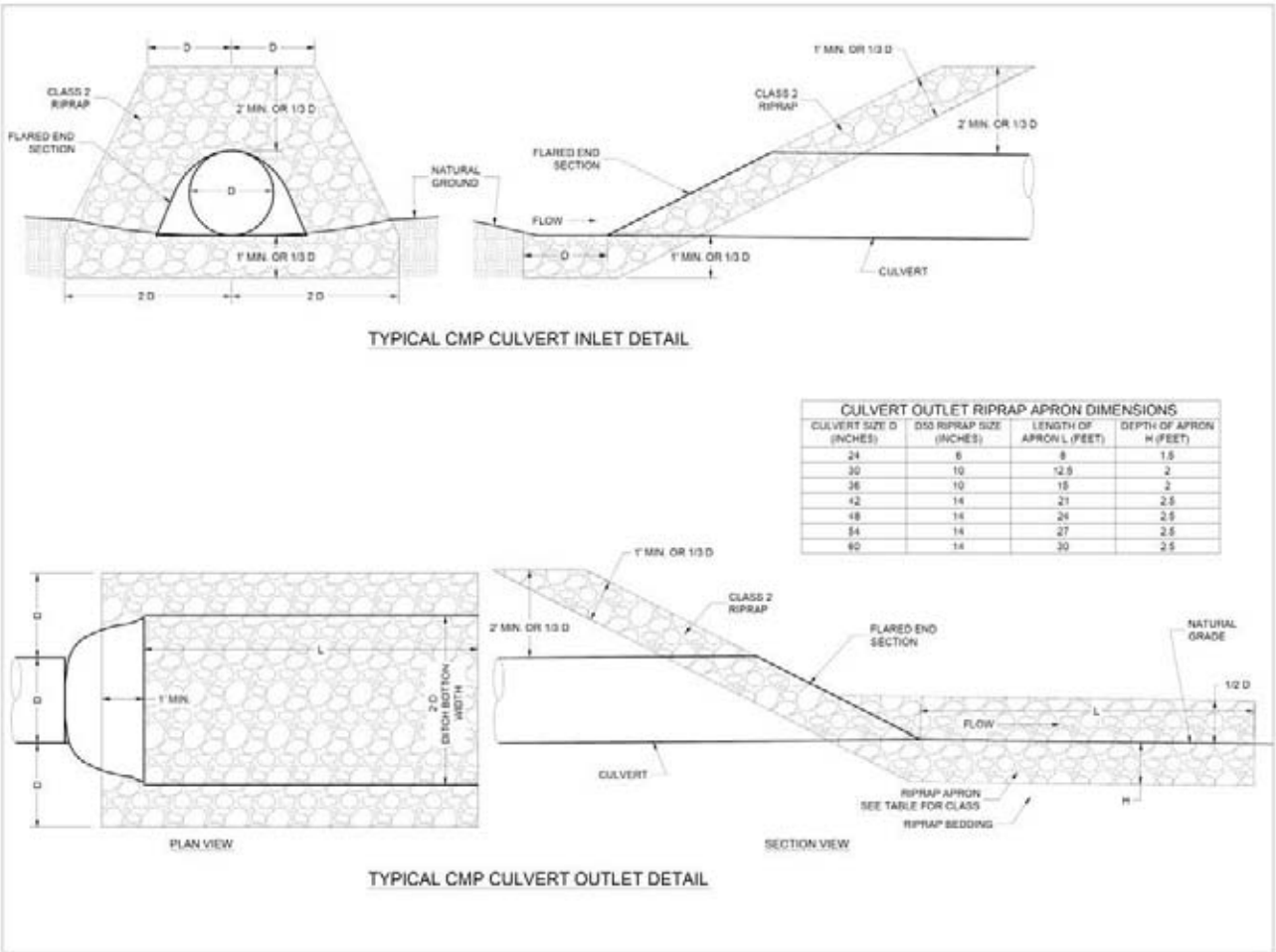


Figure 13. Typical Minor Culvert Inlet and Outlet Protection Detail

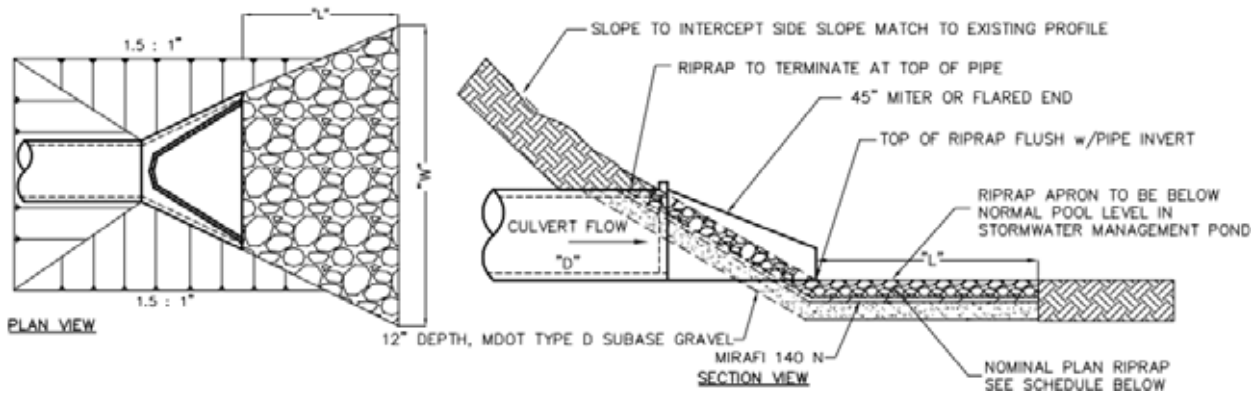
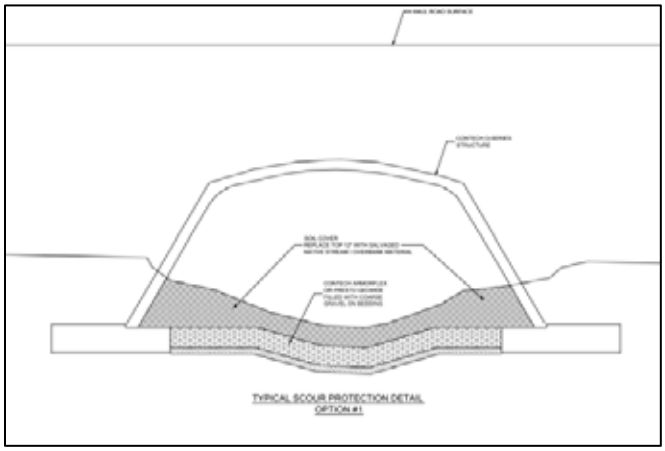


Figure 14. Typical Minor Culvert Outlet Apron

3.3.5.3 Major Natural Bottom Culverts

Two crossings along the Phase I Haul Road are planned to be constructed with long-span, open bottom arch culverts (Contech O-Series or equivalent). The natural channel bottoms will be constructed with the existing native channel material. The arch culvert will have concrete footings to support the structure and roadway over the top of the culvert

Outlet protection will be calculated and designed on an individual basis using HEC-14. The procedures in HEC-14 provide design information for analyzing and mitigating energy dissipation problems at culvert outlets and in open channels. The riprap D_{50} size and apron dimensions are calculated based on the drainage structure's shape, dimensions, design discharge, and tailwater elevation. Riprap or cable concrete will be buried under the native material and will protect the concrete footings from being undermined from excessive scour during a large storm event. A sheet-pile cutoff wall, or other grade control device, on the downstream end will provide protection against a large head-cut undermining the structure Example scour protection options for the arch structure are shown in Figure 15 and Figure 16.



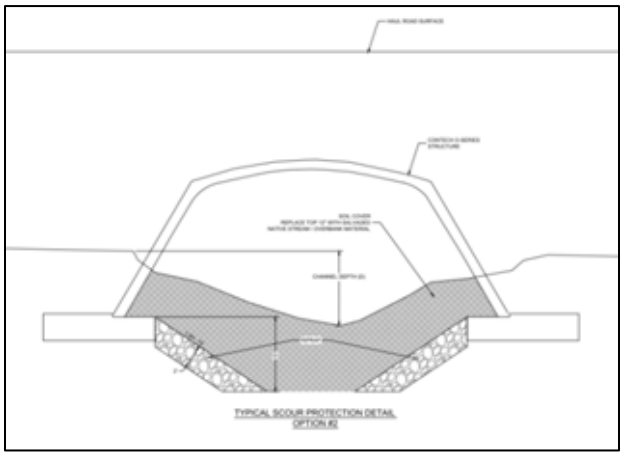


Figure 15. Scour Protection Options for Open Bottom Arch Structure Footings

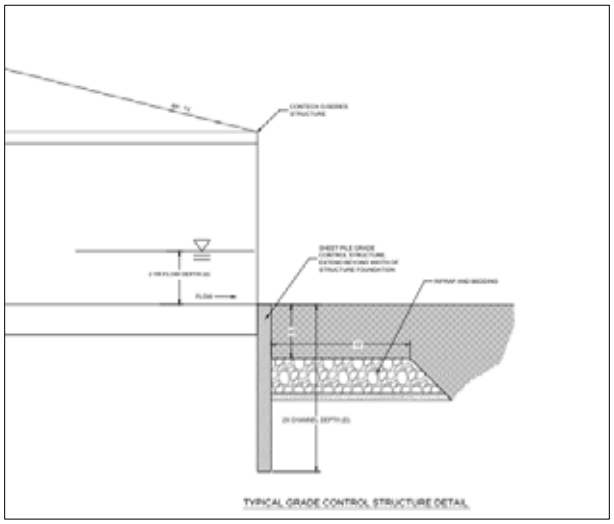


Figure 16. Grade Control Protection for Open Bottom Arch Structure

3.4 DITCHES

CCSM Project roads have been designed to minimize the use of ditches by staying on ridges or flat areas; however, ditches are necessary in several locations. Ditches are designed to protect the road from stormwater runoff, prevent longitudinal flow from conveying on the driving surface, and provide water with a defined location to channelize. While the BLM preference for stormwater management is to direct water to flat, vegetated, stabilized areas, this is not always achievable in the CCSM Project Site and in some instances doing this would increase the CCSM Project disturbance. Where flat, vegetated, stabilized areas are not available or would significantly increase the CCSM Project disturbance, ditches are used to collect water and convey it away from the road toward existing natural drainages. The use of ditches varies based on the road classification. Haul-class roads have significant ditching to maintain the road design requirements. As the road design requirements lessen for each subsequent road type, ditches are needed in fewer locations. Turbine, facility, and structure class roads have limited to no ditches.

3.4.1 Ditch Design

Ditches are designed based on the storm event shown in Table 1 for each of the different road classifications. Each ditch is designed based on the maximum drainage area that will be draining to the ditch at the ditches minimum slope. Based on the design speed of the road class, the ditch fore slope and back slope range from 4:1 on haul-class roads to 2:1 on turbine and facility class roads. The depth of the ditch and the width of the ditch vary based on the hydraulic design requirements of the ditch. All ditches have a minimum bottom width of 2 feet. Ditches will be stabilized using a variety of different methods based on the slope of the ditch and the velocity of the water. The primary sediment control will be rock checks and the primary erosion control

will be the establishment of vegetation. More information on stabilization can be found in the SWPP Plan for each site-specific plan of development.

3.4.2 Wing Ditch Use

The construction of wing ditches for CCSM Project roads has been considered. It has been determined that wing ditches are not appropriate for the CCSM Project because the majority of the road ditches have one or more of the following characteristics:

- Ditches are located on the 'uphill side' of the road and there is no flat area to construct a wing ditch for the water to infiltrate;
- Ditches are less than 200 feet in length, i.e. water that accumulates in the ditch is very shallow and is not anticipated to result in erosion as it outlets;
- Ditches have a longitudinal slope of less than 2%; i.e. water velocity in the ditch is not anticipated to result in erosion; or
- Ditches empty onto the toe of fill slopes located away from existing drainage ways.

In addition, the use of wing ditches will increase the overall disturbance for the CCSM Project. Also, existing vegetated areas that would be needed to disperse the energy are sparse throughout the CCSM Project Site. The road ditches that do discharge to existing drainage ways will outlet into areas of rip rap and other stabilization which will diffuse the ditch flow and avoid additional erosion of the drainage way.

3.4.3 Relief Culverts

Relief culverts will be used on CCSM Project roads that require a ditch on the uphill side of the road. By design, the road centerlines are above the natural ground to allow for ditches and to balance the earthwork as locally as possible. Relief culverts will be placed periodically to allow runoff to be conveyed underneath the road. BLM Manual 9113 provided guidance for the placement of relief culvert. This guidance has been taken into consideration and relief culverts have either been placed at regular intervals according to BLM guidance or at strategic locations where culverts can outlet into existing drainages. This allows for runoff to outlet culverts in existing concentrated flow areas so the water can continue to follow natural patterns while still reducing the amount of water conveyed by roadside ditches. Relief culverts are typically placed at a 30 degree angle with an upstream berm directing the runoff into the culvert (see Figure 17). PCW plans to use round CMP culverts between 18 and 24 inches for relief culverts.

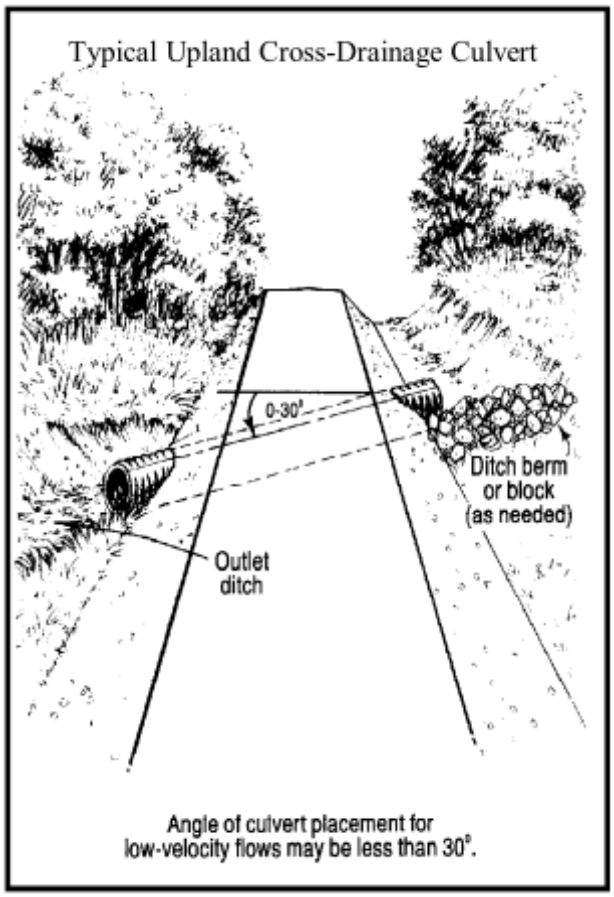


Figure 17. Example Relief Culvert

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APPENDIX D

Chokecherry and Sierra Madre Wind Energy Project

Transportation Management Plan

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September 2013
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1. Introduction

Power Company of Wyoming LLC (PCW) proposes to construct and operate the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatt (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). See Figure 1. The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office. A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal lands within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

Transportation requirements are a primary consideration for the construction, operation, maintenance and decommissioning of the CCSM Project, including each site-specific plan of development. This transportation management plan (TMP) evaluates the transportation requirements of the CCSM Project, the existing and proposed infrastructure in the vicinity of the CCSM Project Site, and existing and anticipated traffic conditions to develop strategies to avoid and minimize transportation impacts from the CCSM Project to the extent practicable.

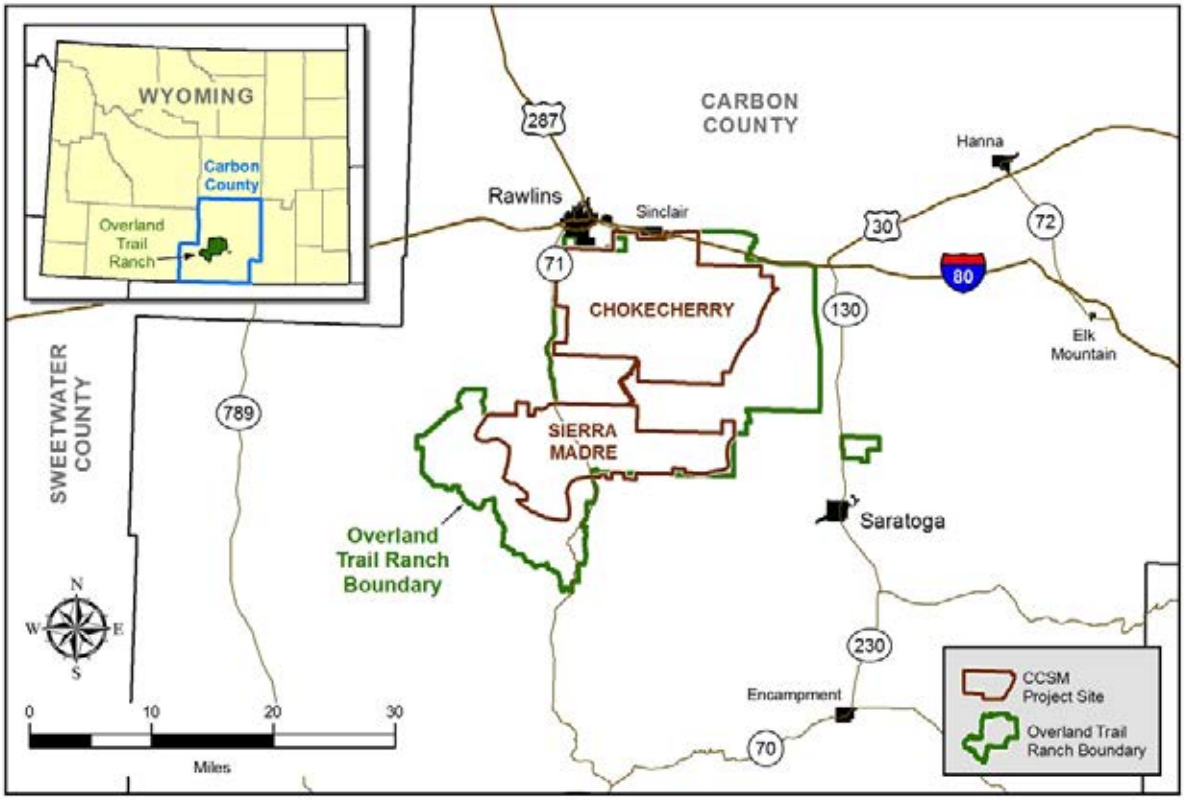

Figure 1. CCSM Project Location

2. Transportation Strategy

PCW has developed a transportation strategy to cost-effectively use local resources and minimize transportation impacts to the extent practicable during construction, operations, maintenance and decommissioning of the CCSM Project. The objective of the transportation strategy is to keep deliveries internal to the CCSM Project Site when possible. To meet this objective, PCW's preference is to: (1) source material on-site where suitable and practicable; (2) deliver components and material by rail to the extent practicable; and (3) obtain any remaining materials and components by truck, prioritizing local sources, to reduce emissions and provide additional benefits to the local economy.

To develop a transportation plan that implements PCW's transportation strategy, PCW first established the transportation requirements of the CCSM Project. Following evaluation of the CCSM Project requirements, PCW reviewed the existing transportation infrastructure and proposed new facilities and upgrades as needed. Finally, PCW re-evaluated the CCSM Project transportation requirements to assign delivery methods to each off-site delivery in accordance with the transportation strategy.

3. Transportation Requirements

PCW evaluated the CCSM Project to identify the transportation requirements during construction, operations, maintenance, and decommissioning. Transportation needs for the CCSM Project are expected to be most complex during construction; therefore, construction is the focus of the transportation plan. PCW does not anticipate that additional transportation infrastructure or management strategies will be required during operations, maintenance, and decommissioning of the CCSM Project. To identify potential transportation impacts of the CCSM Project during construction, PCW estimated the construction delivery and workforce commuting requirements, as described below.

3.1 Off-Site Deliveries

The scope of this TMP is to analyze potential off-site transportation impacts from the CCSM Project; therefore, PCW has reviewed the CCSM Project design and schedule to estimate the off-site delivery requirements for the primary components and materials required to construct the CCSM Project (Table 1)[1].

[1] PCW arrived at the off-site delivery requirements for the CCSM Project by taking the total CCSM Project material requirements and subtracting the aggregate and water that would be obtained on-site, as described in section 4.1.

Table 1. CCSM Project Delivery Requirements from Off-Site Sources

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	243	257	0	243	257	1,000
Hubs	ea	0	0	243	257	0	243	257	1,000
Tower Sections	ea	0	0	891	942	0	891	942	3,666
Blades	ea	0	0	729	771	0	729	771	3,000
Manifest Items									
Rebar	tons	0	9,000	20,000	12,000	8,000	20,000	12,000	81,000
Steel	tons	0	0	325	200	0	100	100	725
Cable Reels	ea	0	779	1,423	1,187	888	586	427	5,290
Sub Transformers	ea	0	0	8	4	0	2	2	16
WTG Transformers	ea	0	0	243	257	0	243	257	1,000
Poles	ea	0	0	2,200	2,000	0	2000	1800	8,000
Junction Boxes	ea	0	270	404	312	285	446	255	1,972
Construction Material									
Road Cap	cu yd	64,000	127,000	39,000	25,000	62,000	25,000	33,000	375,000
Road Stabilization	cu yd	2,500	17,300	6,400	3,100	5,800	6,200	2,600	43,900
Rail Ballast	cu yd	0	51,000	0	0	0	0	0	51,000

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Rail Sub-Ballast	cu yd	0	148,000	0	0	0	0	0	148,000
Laydown Yard Aggregate	cu yd	3,000	126,000	0	0	0	0	0	129,000
Substation Aggregate	cu yd	0	28,000	12,000	0	6,000	6,000	0	52,000
Thermal Backfill	cu yd	0	18,000	46,000	28,000	22,500	45,000	22,500	182,000
Rip-Rap	cu yd	9,100	39,500	20,300	9,800	15,100	19,300	8,100	121,200
Aggregate – Concrete	cu yd	700	52,500	103,300	56,400	48,700	114,200	37,800	413,600
Sand	cu yd	300	32,900	65,400	35,500	31,500	72,400	24,200	262,200
Cement	cu yd	0	16,286	36,492	22,619	14,778	37,849	22,770	150,794
Fly Ash	cu yd	0	2,077	4,654	2,885	1,885	4,827	2,904	19,232
Water (from off-site)	ac ft	26	22	0	0	0	0	0	48
Construction Equipment									
Equipment	ea	88	342	437	431	88	342	437	2,165
Trailers	ea	25	25	25	25	25	25	25	175

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

3.2 Workforce

To further evaluate the CCSM Project transportation requirements during construction, PCW estimated the workforce that will commute to the CCSM Project Site from nearby communities. PCW may elect to house a portion of the workforce in an on-site construction camp; however, for the purposes of this analysis, PCW conservatively assumed that the entire workforce will commute to the CCSM Project Site.

Table 2 summarizes the anticipated peak workforce by month for the CCSM Project including both construction and operations personnel. The construction workforce for Phase I of the CCSM Project reaches a peak of 945 workers in 2017. Operations personnel will commence work as project components (i.e., the rail facility and quarry) become operational. This TMP analyzes a combined peak workforce of 1,290 occurring in August of 2017.

Table 2. Peak Labor Force by Month

Month	2014	2015	2016	2017	Phase II Year 1	Phase II Year 2	Phase II Year 3
Jan	0	14	17	57	76	81	101
Feb	0	14	17	57	76	81	101
Mar	0	14	32	72	81	96	116
Apr	0	32	62	95	99	126	139
May	0	59	157	219	111	319	261
June	0	121	926	602	144	917	666
July	0	408	1,253	1,285	319	1,185	1,060
Aug	0	**487**	**1,258**	**1,290**	**416**	**1,190**	**1,065**
Sep	**107**	427	999	1,167	356	976	1,082
Oct	107	309	392	560	248	461	516
Nov	107	136	178	299	125	227	283
Dec	12	29	64	103	83	113	139

4. Infrastructure

Following establishment of the CCSM Project transportation strategy and requirements, PCW evaluated on-site material sources and reviewed the existing transportation infrastructure in the vicinity of the CCSM Project (Figure 2). PCW proposed new infrastructure, as well as upgrades to existing infrastructure, as needed to accommodate the CCSM Project and implement the transportation strategy (Figure 3). A detailed analysis of the transportation infrastructure in the vicinity of the CCSM Project is included in Attachment A; a summary is provided below.

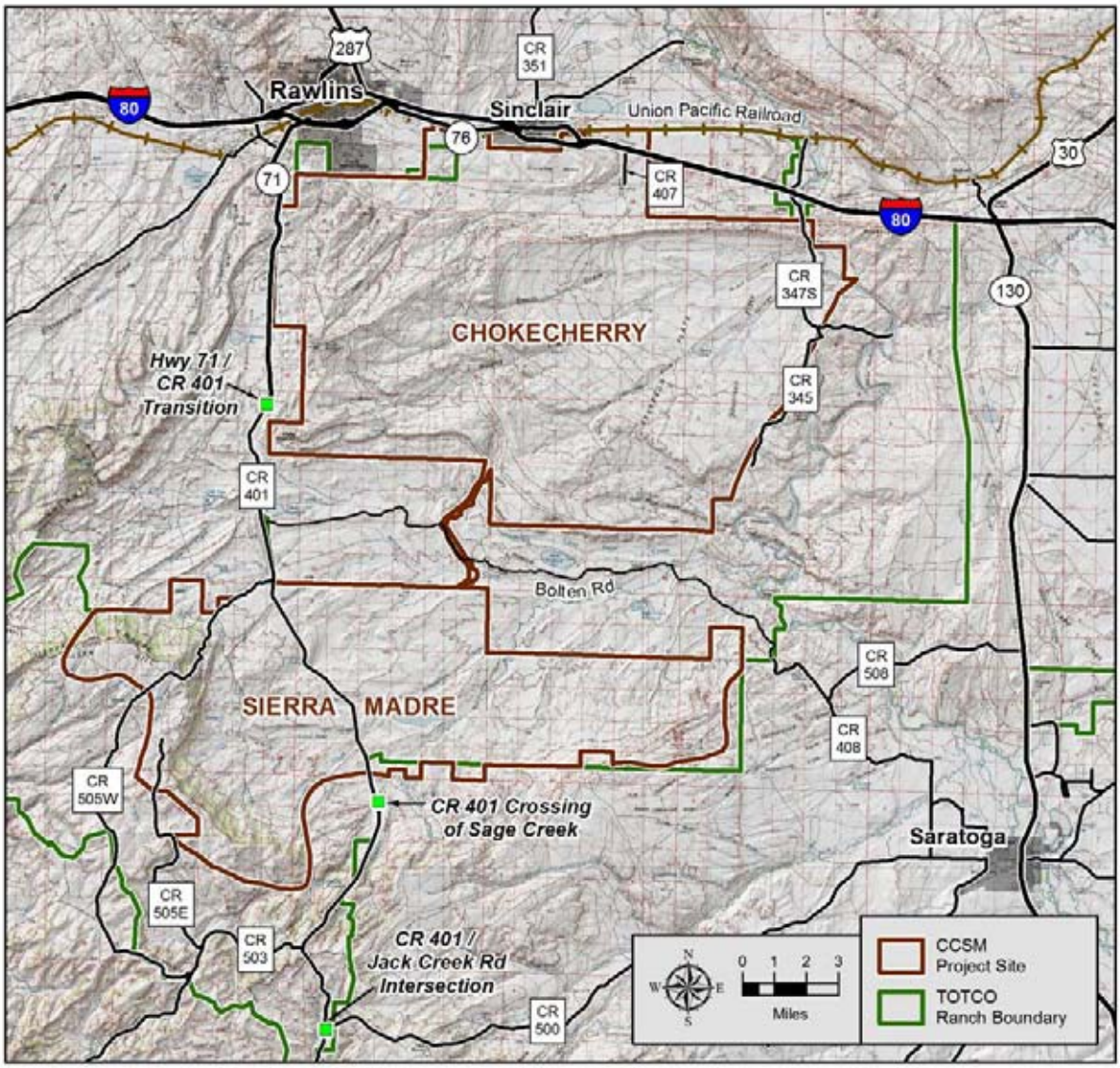

Figure 2. Existing Transportation Infrastructure

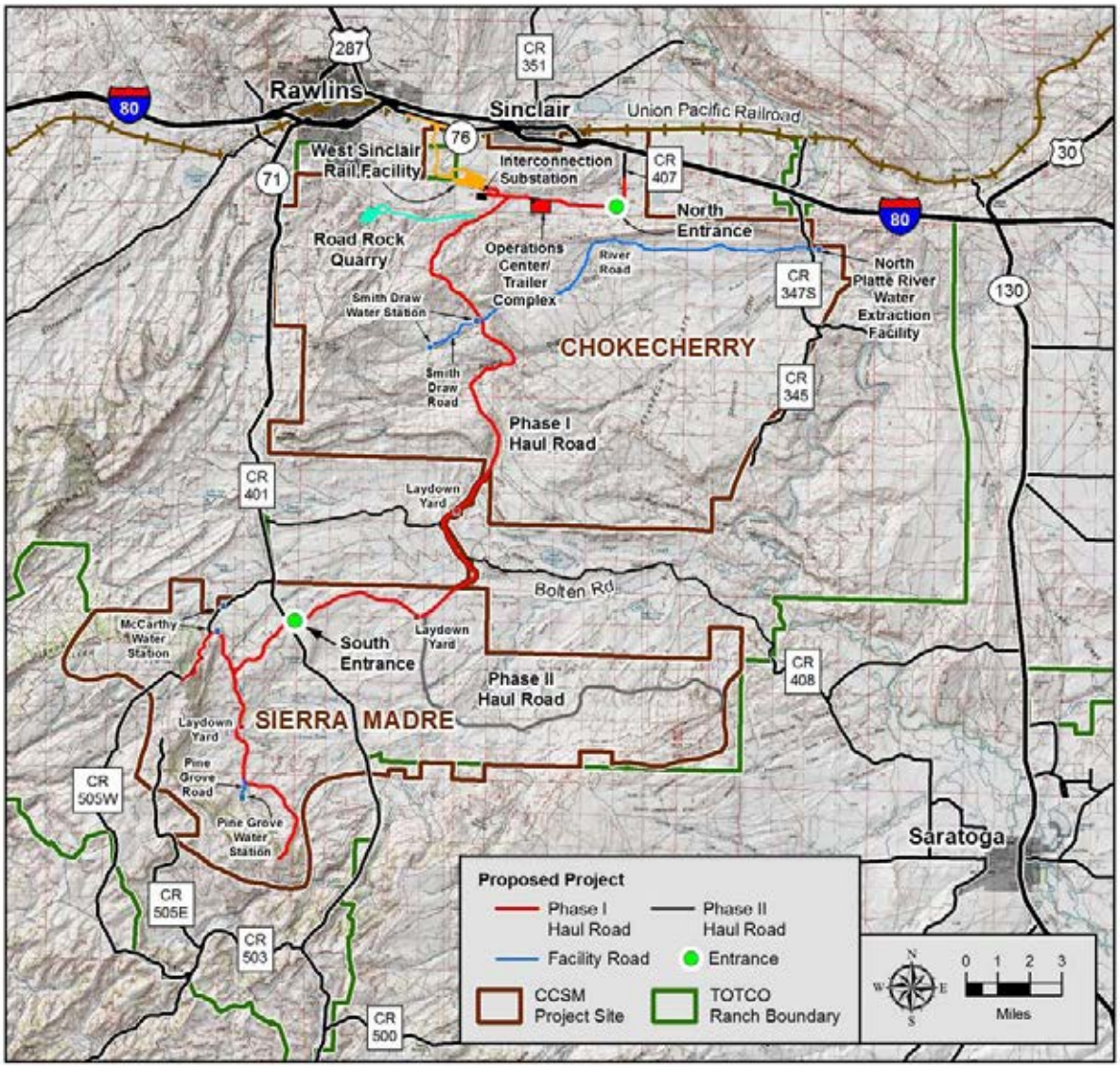

Figure 3. Proposed Transportation Infrastructure

4.1 On-site Material Sources

In accordance with the CCSM Project transportation strategy, PCW evaluated the CCSM Project Site to identify opportunities to use on-site materials where suitable and practicable. PCW's evaluation resulted in the identification of two materials that could feasibly be sourced on-site; water and base aggregate.

For the CCSM Project's water requirements, PCW identified groundwater and surface water rights within the CCSM Project Site that will be used along with locally available municipal supplies to construct, operate, maintain and decommission the CCSM Project. PCW proposes to construct a water system for the CCSM Project to bring water from these sources to five

water stations within the CCSM Project Site where water trucks will be filled (Figure 3). While on-site water sources have been identified, PCW may need to deliver water by truck during construction of the CCSM Project water system. The off-site transportation requirements described in section 3.1 account for the portion of the water that may be obtained off-site. Details on the CCSM Project water sources and water stations are included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

A geotechnical investigation of the CCSM Project Site determined that the most feasible option for obtaining base aggregate on-site is the Road Rock Quarry. The location, a previously established quarry, has sufficient quantities of sandstone to meet a significant portion of the CCSM Project need for base aggregate. PCW proposes to construct, operate, maintain and decommission the Road Rock Quarry to obtain this base aggregate. The Road Rock Quarry is located in the northern portion of the CCSM Project Site and will connect to the CCSM Project internal road network (Figure 3). Details on the Road Rock Quarry are included in the Road Rock Quarry Site Specific Plan of Development.

4.2 Rail

Rail is a key component of PCW's transportation strategy. Many of the components required to build the CCSM Project will be transported long distances; PCW reviewed these components and found that most can be delivered by rail. While it is not economical to bring in all material and components by rail, the use of rail delivery for a large portion of the components reduces transportation impacts and provides an economic benefit to the CCSM Project.

The Union Pacific "Overland Route" corridor, the original "Transcontinental Railroad" completed in 1869, is located along the northern boundary of the CCSM Project Site. The location of the railroad adjacent to the CCSM Project Site presents a unique opportunity for PCW to minimize transportation impacts by delivering materials and components for the CCSM Project by train. While the Overland Route main line is heavily used, Union Pacific has indicated that additional trains used to deliver components to the CCSM Project would not cause any significant impacts to the system. PCW and Union Pacific have estimated that peak rail deliveries to the CCSM Project Site would still be less than a 0.2% increase to daily rail traffic.

PCW conducted a survey of existing rail facilities in the region surrounding the CCSM Project Site. To evaluate the suitability of the existing rail facilities, PCW considered that: (1) many of the wind turbine components will arrive in dedicated unit trains of up to 6,500 feet in length; (2) the CCSM Project has a limited annual working season that requires components to arrive in a shortened window; (3) components may arrive from up to three manufacturers during the working season; and (4) to safely receive, store, unload, and release unit trains requires in excess of 26,000 feet (equivalent to 4 unit trains) of track. All existing rail facilities surveyed in the region surrounding the CCSM Project Site were either too small to be used by the CCSM Project or would require significant expansion and long-distance trucking; therefore, PCW

determined that none of these facilities meet the CCSM Project transportation strategy objective (Attachment A).

To meet the objective of the CCSM Project transportation strategy, maximizing the use of rail delivery, PCW proposes to construct, operate, maintain and decommission a new rail facility, the West Sinclair Rail Facility (Figure 3). The West Sinclair Rail Facility will connect to the UPRR main line between Rawlins and Sinclair and includes a rail loop, various unloading tracks and adjacent laydown yards. An overview of the West Sinclair Rail Facility is included in Figure 4 below. Design details are included in the West Sinclair Rail Facility Site Specific Plan of Development.

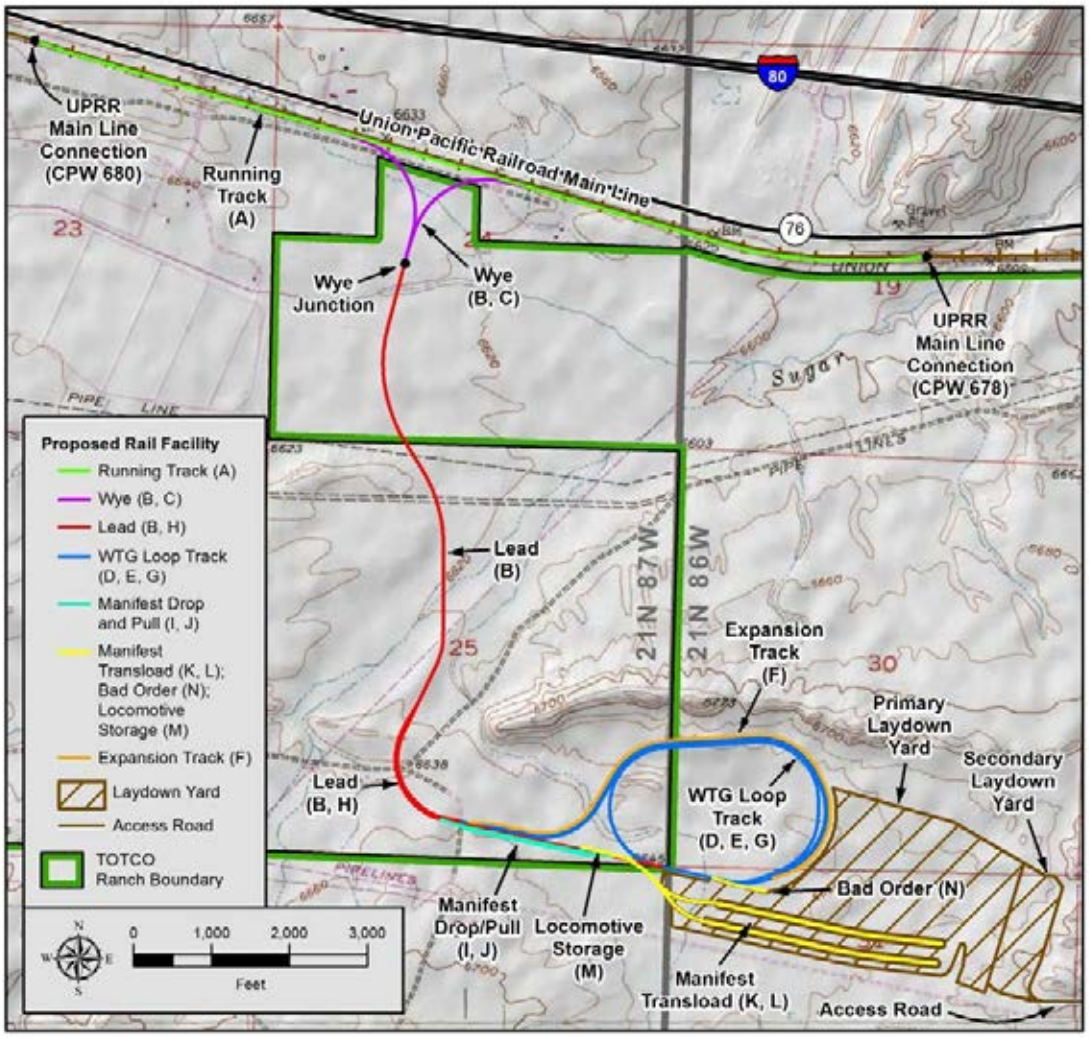

Figure 4. West Sinclair Rail Facility Layout

4.3 Roads

Materials and components that cannot be obtained on-site or by rail will be delivered by truck; these materials primarily consist of aggregate, sand, cement, and fly ash, many of which can be obtained locally or regionally along Interstate 80. Consistent with the transportation strategy, PCW will obtain these materials locally when possible, benefiting local businesses and reducing transportation distances. Some components cannot feasibly be obtained locally; these components will be delivered by long-distance trucking.

To determine transportation options for vehicles, PCW evaluated the location, condition, and physical and legal restrictions of existing roads in the vicinity of the CCSM Project Site, as described in Attachment A and shown in Figure 2. Generally, all of the roads evaluated are sufficient for workforce commuting purposes and other standard vehicles and loads. The majority of the deliveries entering and exiting the CCSM Project are expected to use Interstate 80 to access the CCSM Project North Entrance (Figure 3). PCW may make use of certain existing roads for material delivery, as detailed in Attachment A; however, the use is expected to be minimal.

To minimize the use of public roads for the delivery of materials and components, PCW proposes to construct, operate maintain and decommission the CCSM Project Haul Road that can be accessed from Interstate 80 Exit 221. The CCSM Project Haul Road is the primary route for all material and component delivery traffic to access the wind development areas (Figure 3). The Haul Road connects to Interstate 80 Exit 221 via the CIG Road (CR 407). The Haul Road connects the West Sinclair Rail Facility and the Road Rock Quarry to the wind development areas. Construction of the Haul Road minimizes the use of public roads for deliveries once they enter the CCSM Project Site. Details on the design of Phase I of the CCSM Project Haul Road are included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

In addition to constructing the CCSM Project Haul Road, PCW proposes temporary improvements to Interstate 80 Exit 221, such as shoulder widening, to accommodate extra-long loads. The proposed improvements will be performed within the existing easements and will be removed at the end of CCSM Project construction.

5. Transportation Plan

Using the transportation requirements for the CCSM Project and the existing and proposed infrastructure, PCW developed a transportation plan to meet the objective of the CCSM Project transportation strategy, i.e. keeping deliveries internal to the CCSM Project. The off-site deliveries associated with the CCSM Project were allocated to a transportation mode, i.e. rail or truck, as shown in Table 3 and Table 4. Table 3 and Table 4 constitute the transportation plan for the CCSM Project.

Table 3. CCSM Project Off-Site Deliveries by Rail

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	243	257	0	243	257	1,000
Hubs	ea	0	0	162	171	0	162	171	666
Tower Sections	ea	0	0	810	856	0	810	856	3,332
Blades	ea	0	0	486	514	0	486	514	2,000
Manifest Items									
Rebar	tons	0	0	18,000	10,800	7,200	18,000	10,800	64,800
Steel	tons	0	0	325	200	0	100	100	725
Cable Reels	ea	0	0	1,290	1,068	800	527	384	4,069
Sub Transformers	ea	0	0	8	4	0	2	2	16
WTG Transformers	ea	0	0	219	231	0	219	231	900
Poles	ea	0	0	1,980	1,800	0	1,800	1,620	7,200
Junction Boxes	ea	0	135	364	281	256	401	229	1,666

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

Table 4. CCSM Project Off-Site Deliveries by Truck (in quantities of material)

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Wind Turbine Components									
Nacelles	ea	0	0	0	0	0	0	0	-
Hubs	ea	0	0	81	86	0	81	86	334
Tower Sections	ea	0	0	81	86	0	81	86	334
Blades	ea	0	0	243	257	0	243	257	1,000
Manifest Items									
Rebar	tons	0	9,000	2,000	1,200	800	2,000	1,200	16,200
Steel	tons	0	0	0	0	0	0	0	-
Cable Reels	ea	0	800	142	119	89	59	43	1,252
Sub Transformers	ea	0	0	0	0	0	0	0	-
WTG Transformers	ea	0	0	24	26	0	24	26	100
Poles	ea	0	0	220	200	0	200	180	800
Junction Boxes	ea	0	135	40	31	29	45	26	306
Construction Material									
Road Cap	cu yd	64,000	127,000	39,000	25,000	62,000	25,000	33,000	375,000
Road Stabilization	cu yd	2,500	17,300	6,400	3,100	5,800	6,200	2,600	43,900
Rail Ballast	cu yd	-	51,000	-	-	-	-	-	51,000

Item	Units	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Rail Sub-Ballast	cu yd	-	148,000	-	-	-	-	-	148,000
Laydown Yard Aggregate	cu yd	3,000	126,000	-	-	-	-	-	129,000
Substation Aggregate	cu yd	-	28,000	12,000	-	6,000	6,000	-	52,000
Thermal Backfill	cu yd	-	18,000	46,000	28,000	22,500	45,000	22,500	182,000
Rip-Rap	cu yd	9,100	39,500	20,300	9,800	15,100	19,300	8,100	121,200
Aggregate – Concrete	cu yd	700	52,500	103,300	56,400	48,700	114,200	37,800	413,600
Sand	cu yd	300	32,900	65,400	35,500	31,500	72,400	24,200	262,200
Cement	cu yd	-	16,286	36,492	22,619	14,778	37,849	22,770	150,794
Fly Ash	cu yd	-	2,077	4,654	2,885	1,885	4,827	2,904	19,232
Water (from off-site)	ac ft	26	22	0	0	0	0	0	48
Construction Equipment									
Equipment	ea	88	342	437	431	88	342	437	2,165
Trailers	ea	25	25	25	25	25	25	25	175

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

6. Traffic Study

Following development of the CCSM Project transportation plan (section 5), PCW completed a traffic study (Attachment B) to identify traffic impacts from the CCSM Project. A summary of the traffic study is provided in this section. To evaluate the transportation plan in the traffic study, off-site deliveries occurring by truck were converted into equivalent truckloads (Table 5).

The traffic study for the CCSM Project estimates a traffic profile (deliveries and commuting) for construction, operations and maintenance, and decommissioning based on the delivery schedule and workforce requirements. The peak traffic levels are identified and compared to existing traffic levels on roadways and intersections in the vicinity of the CCSM Project Site. The traffic study evaluates the use of the existing and the new or improved infrastructure described in section 4.

Most of the intersections evaluated in the CCSM Project traffic study are classified as passive two-way stop controlled, meaning stop signs are used to control traffic rather than traffic signals. Evaluation of the traffic profiles and peak traffic levels for the CCSM Project determined instances during construction, where traffic generated by the CCSM Project may exceed the capacity of the nearby road network causing the level of service to be degraded at some of these passive intersections. PCW has determined a number of feasible traffic control measures to reduce the effect on these intersections during peak traffic periods when these impacts are anticipated to occur.

During peak traffic periods, PCW will use temporary active traffic control measures, such as flaggers or temporary traffic signals, as needed to reduce wait times for public traffic to acceptable levels. PCW will also use flaggers to control traffic when extra-long or extra-wide loads are delivered to the CCSM Project Site, and where the Haul Road crosses public roads. If needed, PCW will also stagger the shift start and end times for the labor force on the CCSM Project, e.g. PCW would divide the shift into two equal groups with the second starting and ending one hour later than the first.

The effectiveness of staggering the shift times was analyzed in the traffic study and resulted in significant improvements to impacted intersections. The effectiveness of active traffic control measures, such as flaggers, cannot be quantified within the framework of the traffic study; however, practical experience indicates that both flaggers and temporary traffic signals are effective in controlling traffic and reducing impacts. In fact, the ability of flaggers to be flexible and adaptive in traffic management by allowing longer queues of vehicles to clear intersections as needed is generally superior to the addition of temporary timed traffic lights.

The traffic study does not indicate that traffic control measures will be needed during operations and maintenance or decommissioning. With the implementation of the traffic control measures described above during construction, PCW does not anticipate significant impacts to public traffic.

Table 5. CCSM Project Off-Site Deliveries by Truck (in truckloads)

Item	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Local Truck Deliveries								
Road Cap	3,114	6,178	1,897	1,216	3,016	1,216	1,605	18,243
Road Stabilization	122	842	311	151	282	302	126	2,136
Rail Ballast	0	2,068	0	0	0	0	0	2,068
Rail Sub-Ballast	0	7,200	0	0	0	0	0	7,200
Laydown Yard Aggregate	146	6,130	0	0	0	0	0	6,276
Substation Aggregate	0	1,362	584	0	292	292	0	2,530
Thermal Backfill	0	778	1,989	1,211	973	1,946	973	7,870
Rip-Rap	332	1,441	741	358	551	704	296	4,422
Aggregate – Concrete	26	1,986	3,909	2,134	1,843	4,321	1,430	15,650
Sand	13	1,423	2,828	1,535	1,362	3,131	1,046	11,338
Water	700	583	0	0	0	0	0	1,283
TOTAL LOCAL TRUCK DELIVERIES	**4,453**	**29,991**	**12,259**	**6,605**	**8,319**	**11,912**	**5,477**	**79,015**
Long Distance Truck Deliveries								
Hubs	0	0	81	86	0	81	86	334
Tower Sections	0	0	81	86	0	81	86	334

Item	2014	2015	2016	2017	PII Year 1	PII Year 2	PII Year 3	CCSM PROJECT TOTAL
Blades	0	0	243	257	0	243	257	1,000
Rebar	0	360	80	48	32	80	48	648
Cable Reels	0	200	36	30	22	15	11	313
Poles	0	0	44	40	0	40	36	160
WTG Transformers	0	0	24	26	0	24	26	100
Junction Boxes	0	135	40	31	29	45	26	306
Cement	0	821	1,839	1,140	745	1,908	1,148	7,600
Fly Ash	0	151	339	210	137	351	211	1,400
Equipment	88	342	437	431	88	342	437	2,165
Trailers	25	25	25	25	25	25	25	175
TOTAL LONG DISTANCE TRUCK DELIVERIES	**113**	**2,034**	**3,269**	**2,410**	**1,078**	**3,235**	**2,397**	**14,535**

Notes: 1. PII = Phase II of the CCSM Project
2. The material estimates presented for Phase II assume that a portion of the aggregate will be obtained on-site.

Attachment A. Transportation Infrastructure Assessment

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1.0 Existing Infrastructure

To support the CCSM Project and identify transportation infrastructure needs, PCW analyzed the existing transportation infrastructure in the vicinity of the CCSM Project, specifically the Union Pacific Railroad (UPRR), Interstate 80, and other surrounding roads. PCW reviewed the location, condition, and current use of the infrastructure and identified potential uses. The existing transportation infrastructure in the vicinity of the CCSM Project is described below.

1.1 Rail

Rail is a key component of PCW's transportation strategy. The Union Pacific "Overland Route" corridor, the original "Transcontinental Railroad" completed in 1869 is located along the northern boundary of the CCSM Project Site. The location of the railroad adjacent to the CCSM Project Site presents a unique opportunity for PCW to minimize transportation impacts by delivering a portion of the CCSM project components and materials by train.

The Overland Route is a dual-track mainline corridor representing the primary east-west link between the West Coast and Chicago with over 100 trains passing per day. Many of these trains are unit trains carrying coal (up to 8,000 feet long) or intermodal trains carrying overseas containers (up to 10,000 feet long). The speed limit for trains on the tracks between Sinclair and Rawlins is primarily 70 mph, with a 20 mph limit through a portion of Rawlins. The grade is gentle and increases in elevation east to west by approximately 160 feet between Sinclair and Rawlins. There are also three sidings in this area for holding trains or railcar management.

Union Pacific has designated each of its mainline corridors into one of three categories for industry access under their Network Corridor Line Categorization system, as summarized in Table 1 and displayed in Figure 1. The main line near the CCSM Project Site is classified as a "Restricted Access Corridor." This is the most restrictive category, requiring new industry track facilities to invest in significant infrastructure improvements including new switches, signals, and tracks. These rail system upgrades ensure that any new industry track facilities do not hinder existing railroad operations or traffic.

To meet Union Pacific operational requirements, sufficient running track parallel to the main line must be constructed in order for arriving trains to safely decelerate into and for departing trains to accelerate from an industry track facility.

While the main line in the vicinity of the CCSM Project Site is heavily used, Union Pacific has indicated that additional trains used to deliver project components would not cause any significant impacts to the system. PCW and Union Pacific have estimated that peak rail deliveries to the CCSM Project Site would still be less than a 0.2% increase to daily rail traffic.

Table 1. Union Pacific Network Corridor Line Categories

	Restricted Access	Controlled Access	Allowable Access
Volume	High Volume	Medium Volume	Low Volume
Priority	High Priority	Medium Priority	Low Priority
Stopping	No Stopping	Limited Stopping	Many Stops

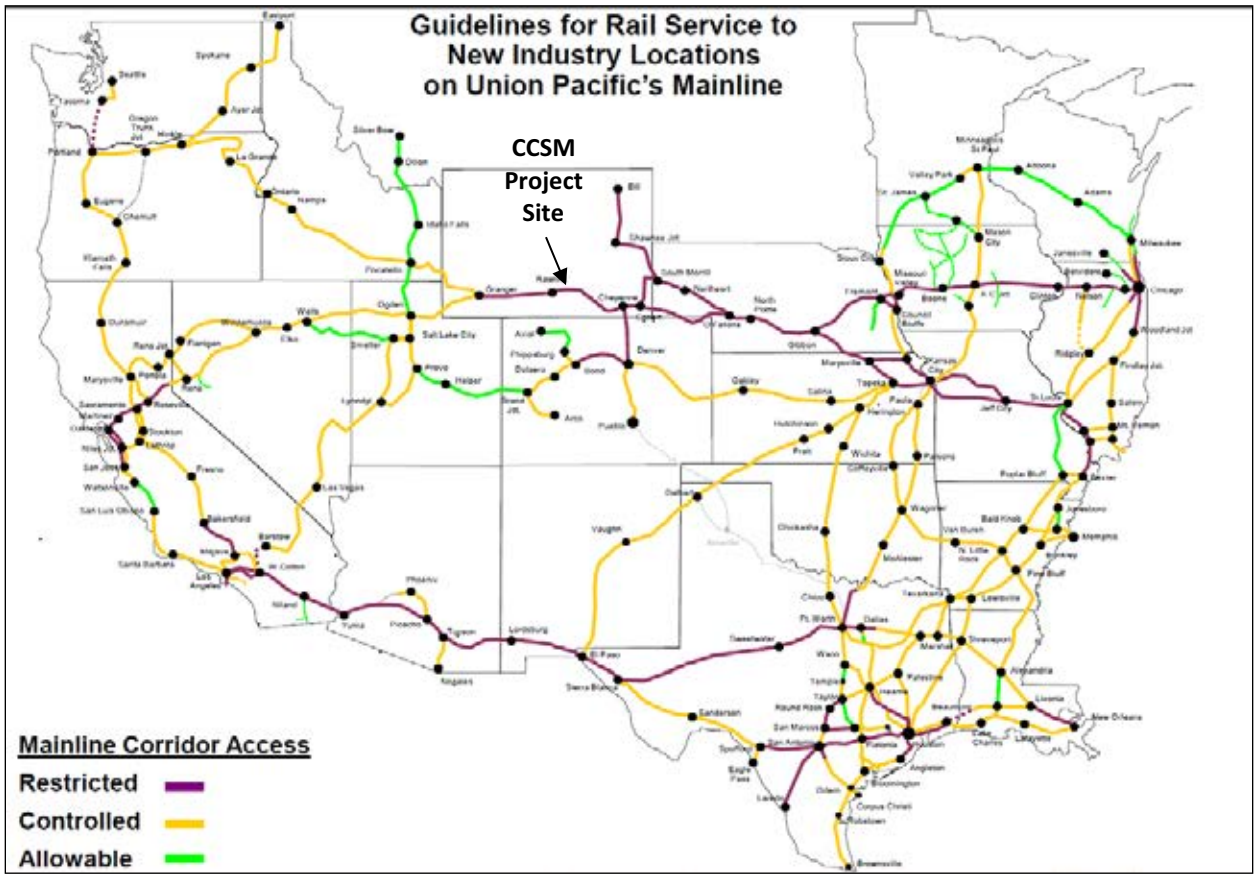

Figure 1. Union Pacific Mainline Corridors

PCW conducted a survey of existing rail facilities in the region surrounding the CCSM Project Site. To evaluate the suitability of the existing rail facilities, PCW considered that: (1) many of the wind turbine components will arrive in dedicated unit trains of up to 6,500 feet in length; (2) the CCSM Project has a limited annual working season that requires components to arrive in a shortened window; (3) components may arrive from up to three manufacturers during the working season; and (4) to safely receive, store, unload, and release unit trains requires in excess of 26,000 feet (equivalent to 4 unit trains) of track.

PCW surveyed, identified, and evaluated the existing rail facilities in the region as summarized below:

- **Rawlins:** There is an existing rail yard in Rawlins that is used primarily for crew changes and fueling. There is insufficient track or space at that location to support the CCSM Project. Use of this facility is not feasible.
- **Sinclair Refinery:** The refinery has a small, privately owned spur that is inadequate in availability or infrastructure for the CCSM Project. Use of this facility is not feasible.
- **Laramie:** This rail yard had sufficient space to take at least some CCSM Project deliveries; however, the yard is 100 miles from the CCSM Project Site and would require long-distance trucking.
- **IDS (Casper):** This is a privately owned and operated transload facility located 135 miles away from the CCSM Project Site, the use of this facility for the CCSM Project would require expansion and long-distance trucking.

All existing rail facilities in the region surrounding the CCSM Project Site were either too small to be used by the CCSM Project or would require significant expansion and long-distance trucking; therefore, PCW determined that none of these facilities meet the needs of the CCSM Project.

1.2 Roads

PCW evaluated the location and condition of the existing roads that can be used to access the CCSM Project. The existing routes that may be used by the CCSM Project are described below and shown in Figure 2. The conditions of the roadways surrounding the Project were initially reviewed by PCW in 2009, and have been periodically observed since.

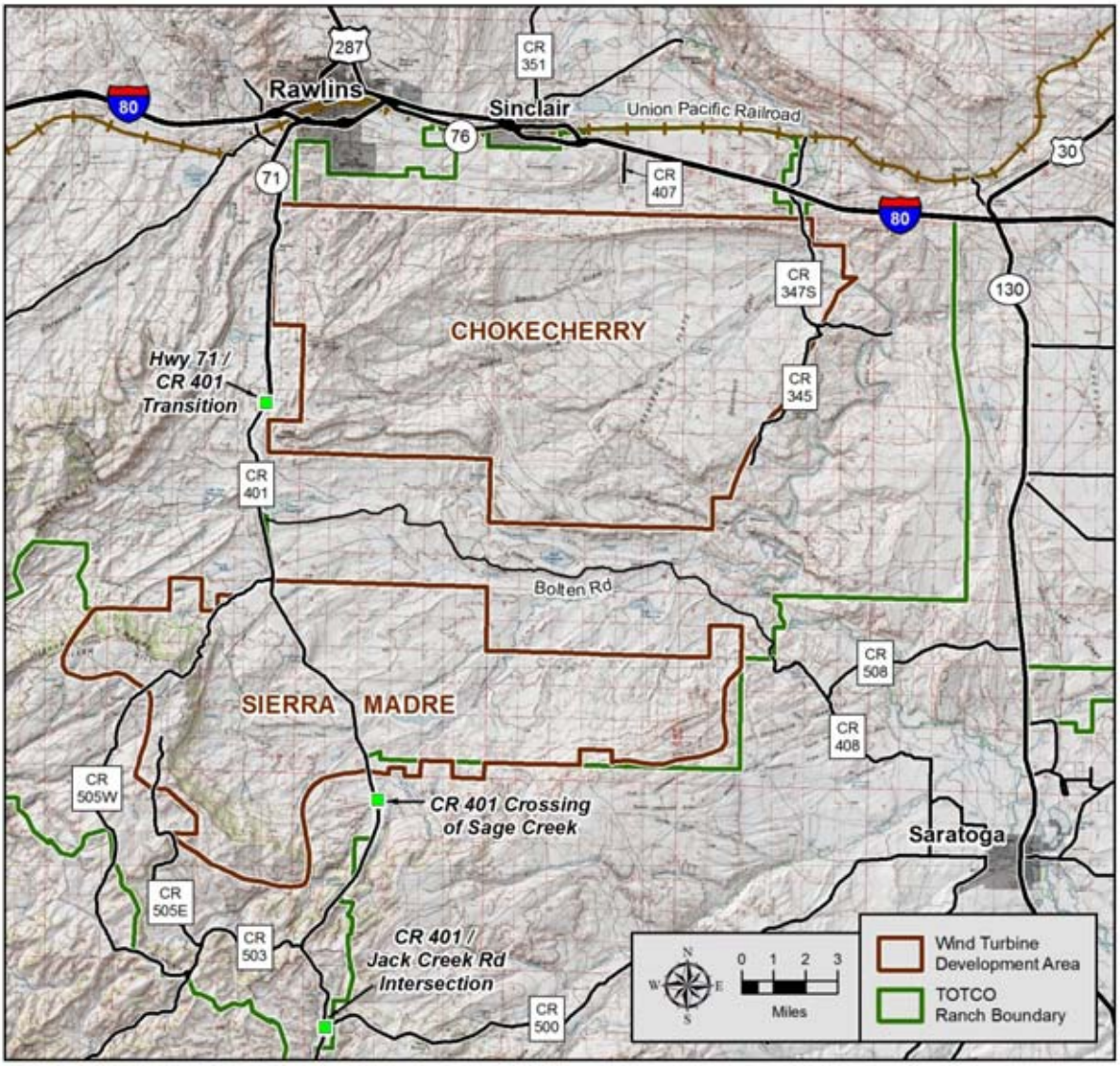

Figure 2. Existing Roadway Network

1.2.1 Condition and Use

Interstate 80

Interstate 80 is a four-lane divided highway with 12-foot lanes, approximately 8-foot shoulders, and is the primary east-west route through southern Wyoming. In the vicinity of the CCSM Project Site, Interstate 80 has one exit west of Rawlins, (exit 209), three exits to Rawlins (exits 211, 214, and 215), two exits to Sinclair (exits 219 and 221) , and an additional exit north of the CCSM Project Site at Fort Steele (exit 228). Walcott Junction (exit 235) is located east of the CCSM Project Site and leads to Saratoga via Wyoming Highway 130 (WY130). All of the interstate exits are diamond interchanges with the exception of exit 215 at Rawlins, which is a trumpet interchange with free movements in all directions (Figure 3). The on- and off-ramps do not typically have acceleration or deceleration lanes on the interstate, but the ramps are

typically at least 1,700 feet, which is an adequate length to allow vehicles to accelerate or decelerate. Interstate 80 has asphalt pavement that is in good condition; due to traffic and weather conditions, Interstate 80 surface improvements occur often to maintain the condition.

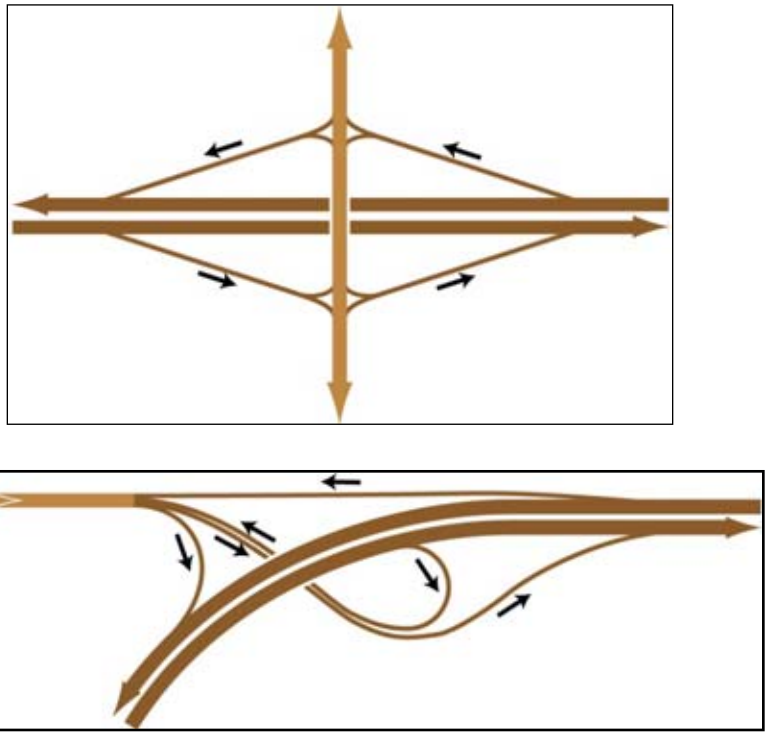

Figure 3. Typical Diamond and Trumpet Interchange Schematics

US287

United States Route 287 (US287) is a major route that carries traffic north and south through Rawlins. The road is a two-lane undivided paved highway with auxiliary lanes through Rawlins with lane widths of at least 12 feet and shoulder widths varying from 1 foot to 4 feet. This road intersects with multiple streets carrying both residential and commercial traffic through town. At the northern end of Rawlins, US287 divides into a business route and a bypass, with the eastern section carrying the bypass traffic that leads to Interstate 80 exit 214 and the western section designated as the business route that leads through town and to Interstate 80 exit 211. From exit 214 eastbound, Interstate 80/US287 is a shared route until US287 splits off in Laramie, Wyoming.

WY130

Wyoming Highway 130 (WY130) is a two-lane undivided highway east of the CCSM Project Site with 12-foot lanes and typically 4-foot shoulders. The segment of this highway from Saratoga to Interstate 80 is a north-south rural route with high speeds, low volumes, and an asphalt surface that is in good condition. This highway does not provide direct access to the CCSM Project Site, but may be used as a commuter route for workers residing in Saratoga.

WY76

Wyoming Highway 76 (WY76) is a two-lane undivided highway that is the primary non-interstate connection between Rawlins and Sinclair. This highway has an asphalt surface in good condition. WY76 will be used by Union Pacific to access their right of way during construction activities associated with the CCSM Project's West Sinclair Rail Facility and may be used as a commuter route for workers residing in Rawlins.

WY71/CR401 (Sage Creek Road)

Wyoming Highway 71 (WY71)/ Carbon County Road 401 (CR401), referred to locally as Sage Creek Road or the South Highway, is a primarily north-south route that is located west of the Chokecherry wind development area and that bisects the Sierra Madre wind development area. WY71 begins in Rawlins just north of Interstate 80 exit 214 and travels along the south side of Rawlins for the first mile in an east-west direction. This section of WY71 does not provide direct access to residences; however, there are collector roads (Davis Street, Jackson Street and Washington Street) that intersect WY71 along the first mile. WY71 then passes under Interstate 80 and primarily becomes a north-south route for the remainder of its length. South of Interstate 80, WY71 is a rural highway with a typical posted speed limit of 65 miles per hour. There are intermittent residential driveways that provide direct access to WY71, as well as multiple county roads, two-track roads, and gated accesses to pastures and fields. There are segments of WY71 with steep vertical curves and limited vertical and horizontal sight distance. Adjacent to the Chokecherry wind development area, state maintenance of the road ends, and the road becomes CR401. CR401 is rural with minimal traffic. The lane widths are typically 12 feet along WY71, and the shoulders vary by section from no shoulders to 3-foot wide shoulders.

WY71/CR401 has various pavement conditions (see Figure 4), with portions being reconstructed in 2012 and 2013. Approximately the first 1.5 miles of WY71 (from Higley Boulevard to the Interstate 80 overpass) is asphalt in good condition. The second segment of WY71 (from the Interstate 80 overpass to the end of WY71 over a distance of 9.5 miles) is a new overlay of asphalt in excellent condition. The remainder of this road (CR401) is being reconstructed into a gravel road with a wider overall driving surface (approximately 40 feet) and updated drainage features. The first segment of CR401 (from the WY71/CR401 transition point to the Sage Creek crossing) was reconstructed in 2012 and is currently in good condition. The second segment of CR401 (from the Sage Creek crossing to at least the intersection with CR500) is currently undergoing reconstruction, and is expected to be in good condition prior to the start of CCSM Project construction.

Figure 4. WY71/CR401 Road Conditions

The CCSM Project's Haul Road will cross CR401 at one location (within the first segment of CR401 described above). Additionally, WY71/CR401 will likely be used as a commuter route for workers residing in Rawlins or working in the Sierra Madre wind development area.

CR505W (Miller Hill Road) and CR505E

Carbon County Road 505W (CR505W), commonly referred to as Miller Hill Road, is the primary access route from CR401 to the top of Miller Hill. It is a low-use gravel road in fair condition. The portion of the road within the CCSM Project Site includes a steep section (approximately 17% grade), and is generally closed due to snow drifts during the winter and spring months.

Carbon County Road 505E (CR505E) is an unsurfaced road on top of Miller Hill. The road dead ends and has very low use.

CR407 (CIG Road)

At Interstate 80 exit 221, Carbon County Road 407 (CR407), commonly referred to as CIG Road, begins south of Interstate 80 (where WY76 ends), travels east and then south and provides access to the Colorado Interstate Gas Energy Plant (CIG Plant). The CR407 from Interstate 80 to CIG Plant (approximately 2.25 miles) has 12-foot lanes with no shoulders, is paved and is in fair to good condition. This portion of CR407 is maintained by both the Wyoming Department of Transportation (WYDOT) and Carbon County. South of the CIG Energy Plant, CR407 ends. PCW anticipates building the CCSM Project's North Road starting at the south end of CR407 to provide access to the North Entrance to the CCSM Project Site. CCSM Project traffic coming in the North Entrance would therefore use CR407.

CR347

Interstate 80 exit 228 (Fort Steele) is near the northern edge of the Chokecherry wind development area. This interchange connects to Carbon County Road 347 (CR347), which travels south along the North Platte River and leads into the Chokecherry wind development area. CR347 is unpaved, less than two lanes wide, and has several instances of steep grades and sharp turns. The use of CR347 for CCSM Project traffic would likely require extensive improvements; therefore, PCW does not anticipate using CR347.

CR500
Carbon County Road 500 (CR500), referred to as Jack Creek Road, is a two-lane gravel road connecting CR401 to Saratoga. Portions of this road are in fair condition, but the condition of the road tends to vary over the course of the year. PCW does not anticipate using CR500 due to concerns regarding its condition and maintenance.

CR408 and CR508
Carbon County Road 408 (CR408) and Carbon County Road 508 (CR508) are two-lane gravel roads that connect Saratoga to the eastern boundary of the CCSM Project Site. There will not be a CCSM Project entrance on the eastern boundary of the CCSM Project Site; therefore, PCW does not expect the CR408 or CR508 will be used by CCSM Project traffic and did not evaluate these roads.

1.2.2 Restrictions

To further evaluate the suitability of the existing road infrastructure for use by the CCSM Project, PCW evaluated the restrictions for use of the roadways in the vicinity of the CCSM Project Site. Road restrictions are described below.

Physical
Physical restrictions are defined as limits to the width, height, or length of trucks or loads. Turbine loads are the most likely to exceed physical restrictions for the CCSM Project. PCW has not yet selected final turbine models for use on the CCSM Project, so to evaluate physical restrictions PCW reviewed the range of candidate turbine models to develop the following maximum physical dimensions:

Height: 18’0”
Width: 17’7”
Length: 180’11”

On WY71, there is an existing underpass at Interstate 80 with a maximum clearance of 15 feet 2 inches. This limitation would likely effect WTG tower base sections and other extra-large components. PCW also predicts that several hills and some curves on WY71/CR401 will be outside the requirements of many wind turbine vendors’ transport guidelines. It is not anticipated that WY71 will be used for large deliveries.

Within Rawlins, there are restrictions for trucks on Washington Street at the UPRR underpass due to a clearance of less than 12 feet. No vehicles other than passenger vehicles or pickup trucks are anticipated on this route.

On 6th Street in Rawlins, there is a bridge crossing the UPRR. There is a truck restriction in place for the bridge that allows local deliveries only. Both the underpass and bridge have relatively

narrow lanes with minimal or no shoulders and are not viable routes for CCSM Project vehicles other than passenger vehicles or pickup trucks.

Weight

In the vicinity of the CCSM Project Site, there are no bridges along or over Interstate 80 or on WY71 that have posted weight restrictions. An annual bridge condition report prepared by WYDOT District 1 in 2009 indicates the WY76 bridge over Interstate 80 at exit 221 (Sinclair) is rated as "fair" overall. Deck, superstructure, and substructure are all rated as "good." The posted status of the bridge is "Open, no restriction." PCW will conduct bridge loading and equivalent single axle load (ESAL) calculations and provide any other pertinent information to determine the suitability of the bridge for CCSM Project deliveries, as required to obtain approval from WYDOT for use of the bridge. This analysis will likely occur during the WYDOT permitting process described below.

Timing

PCW is not aware of any timing-based restrictions on the use of the roads discussed above.

Load Type Restrictions

Load type restrictions are not anticipated for the vast majority of the CCSM Project loads. PCW is not aware of any CCSM project loads that are restricted; however, it is possible that some loads, such as fuel or dust mitigation chemicals, may have permitting requirements and route restriction based on load-type.

1.2.3 Permits

Transportation permits will likely be required for some CCSM Project loads and access roads. These permits may include restrictions. Common permit requirements that may apply to the CCSM Project loads, access roads and highways are described below.

Access Permits

PCW anticipates that the CCSM Project will require access at locations along CR401. New access points along Carbon County roads require review by the Carbon County's Department of Roads and Bridges. This review, patterned after the WYDOT access permitting process, requires that a new access point likely to see more than 50 trips per day have a traffic study performed. The data required for this permit is included in the CCSM Project traffic study.

WYDOT Permits

As indicated above, some of the vehicles transporting equipment to and from the CCSM Project Site are anticipated to be oversized. Vehicles traveling on the interstate and state highway system will comply with WYDOT standards for oversize loads.

Wyoming issues permits for oversize and heavy-load vehicles that are up to 18 feet in width, 17 feet in height, and 90 feet in length for single trailers or 110 feet in length for double trailers. The weight limit for heavy-load vehicles is 150,000 pounds gross vehicle weight (additional guidelines are identified on the state's website). Vehicles that exceed these requirements will

require additional permits to travel on the interstate and state highway system. Additional requirements and restrictions such as escort vehicles, travel hours (i.e. daylight), and convoy size may apply and will be determined during the permitting process.

2.0 Proposed Infrastructure and Improvements

Following evaluation of the existing transportation infrastructure in the vicinity of the CCSM Project, PCW proposed new infrastructure, as well as upgrades to existing infrastructure, to accommodate the CCSM Project.

2.1.1 West Sinclair Rail Facility

To meet the needs of the CCSM Project, PCW proposes to construct, operate, maintain and decommission a new rail facility, the West Sinclair Rail Facility. The West Sinclair Rail Facility will connect to the UPRR main line between Rawlins and Sinclair, and will include a running track and wye junction. Trains delivering CCSM Project components and materials will travel along a lead track to the rail loop and various unloading tracks. A laydown yard will be located within the Rail Facility adjacent to the unloading tracks. An overview of the West Sinclair Rail Facility is included in Figure 5 below. Additional information on the design and anticipated operation of the West Sinclair Rail Facility is included in the West Sinclair Rail Facility Site Specific Plan of Development.

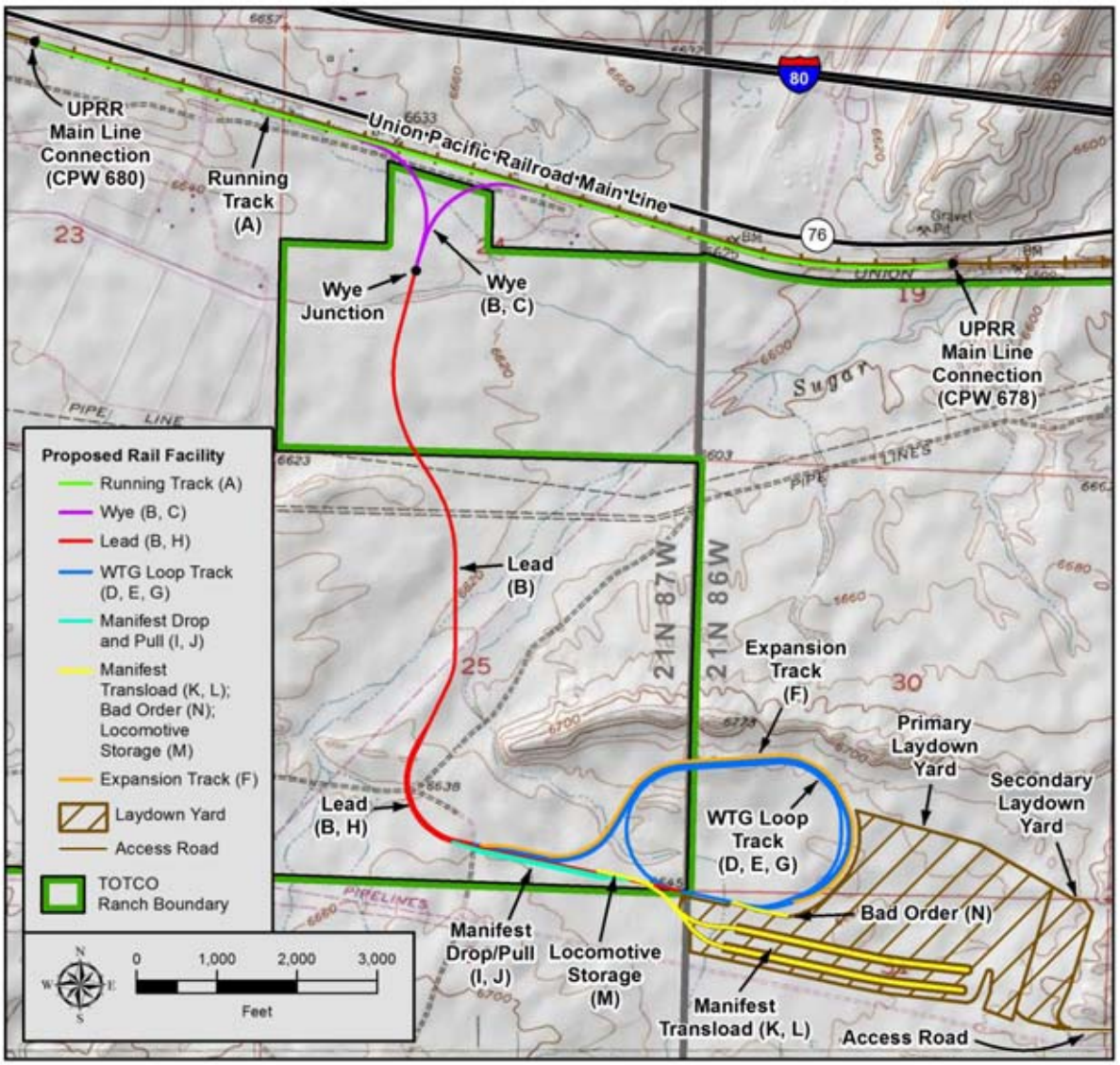

Figure 5. West Sinclair Rail Facility Layout

2.1.2 CCSM Project Haul Road

To keep CCSM Project traffic internal to the extent possible, PCW proposes to construct, operate, maintain, and decommission the CCSM Project Haul Road. The Haul Road is the primary access route for all delivery traffic to the various wind development areas. The Haul Road is accessed using Interstate 80 Exit 221 and CIG Road. The Haul Road connects the West Sinclair Rail Facility and the Road Rock Quarry to the Chokecherry and Sierra Madre wind development areas. The Haul Road minimizes the use of public roads for delivery of materials once they arrive at the CCSM Project Site. The Haul Road crosses CR 401 (Sage Creek Road) in a single location and follows portions of CR505W and CR 407 (Figure 6). Additional information

on the design of the CCSM Project Haul Road is included in the Phase I Haul Road and Facilities Site Specific Plan of Development.

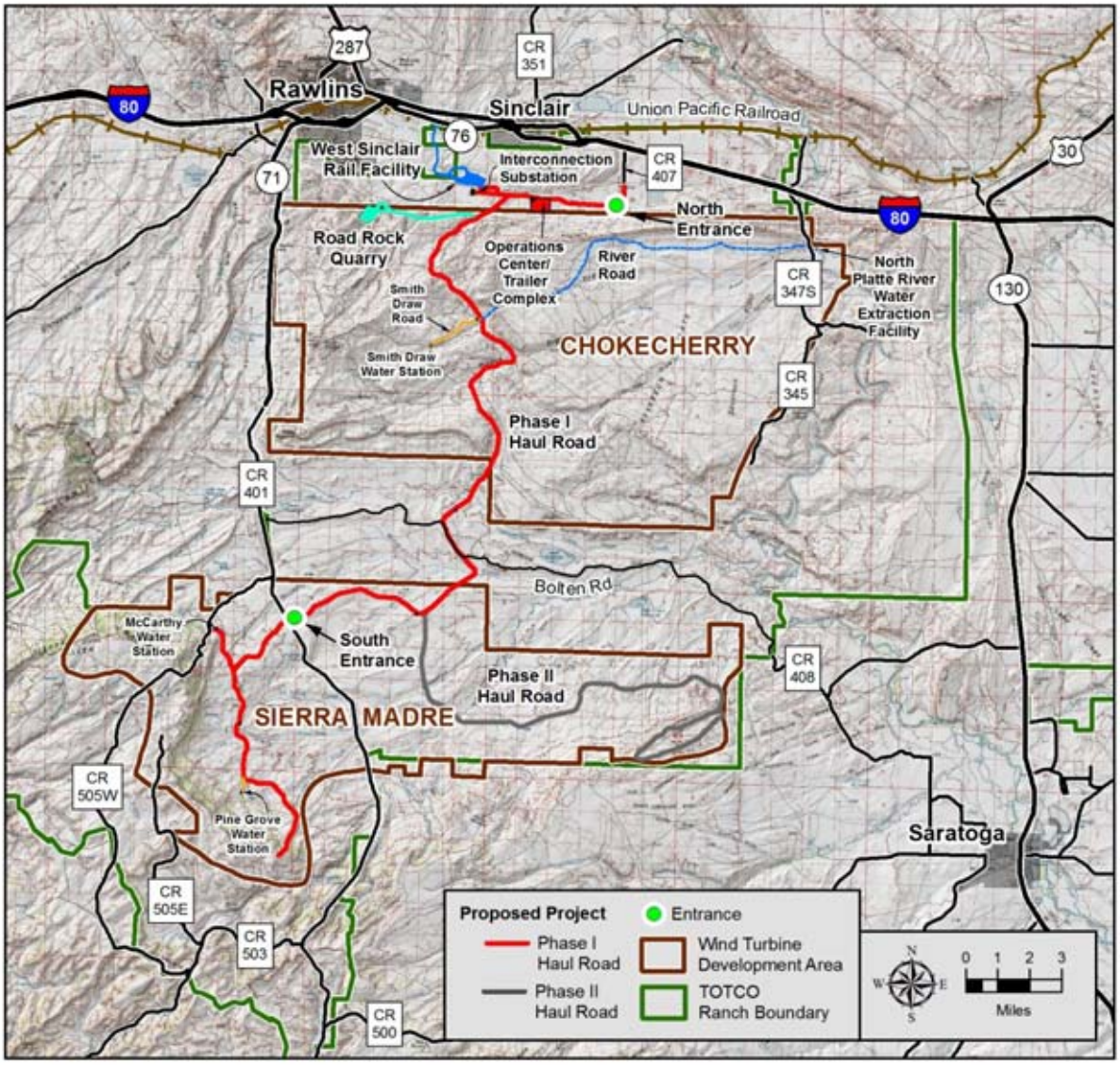

Figure 6. New CCSM Project Infrastructure

2.1.3 Temporary Improvements to Exit 221

While no permanent changes to Interstate 80 Exit 221 are required for the CCSM Project, PCW anticipates that some temporary physical changes may be required to deliver extra-long loads. PCW anticipates shoulder widening of the westbound off-ramp to allow a wider turn radius to the south, and widening of the eastbound off-ramp to avoid the jog onto CIG Road (Figure 7). Also, some minor widening of the 90-degree turn in CIG Road will be beneficial for the extra-long trucks. All of these improvements can be performed within the existing easements for the

public roads, and will be removed at the end of CCSM Project construction. PCW will obtain all necessary permits from WYDOT and Carbon County before installing temporary improvements.

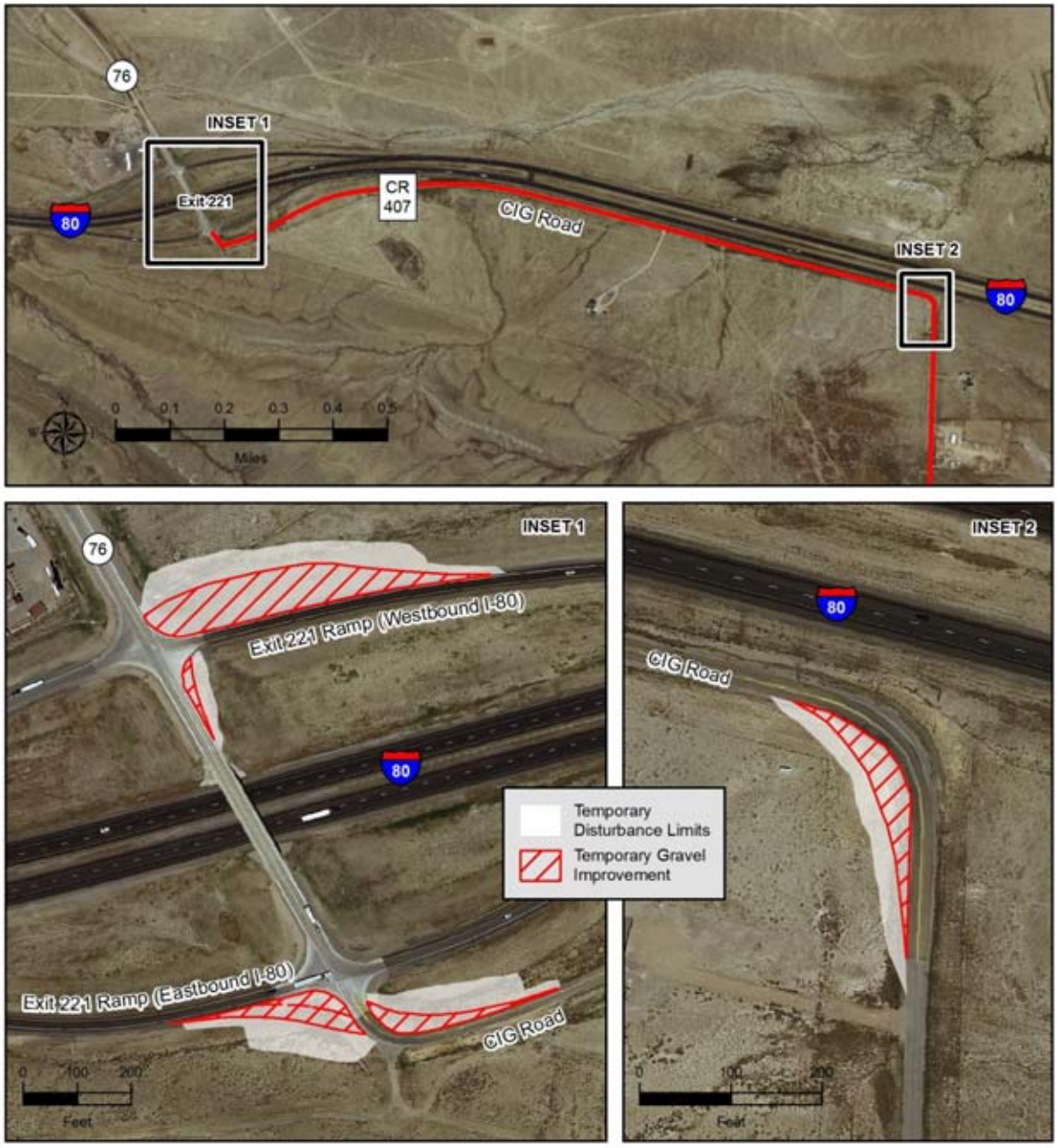

Figure 7. Interstate 80 Exit 221 Temporary Improvements

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Acronym List

ADT	average daily traffic
CCSM	Chokecherry and Sierra Madre
CCSM Project	Chokecherry and Sierra Madre Wind Energy Project
EIS	Environmental Impact Statement
HCM	Highway Capacity Manual
LOS	level of service
pc/h/ln	passenger cars/hour/lane
PCW	Power Company of Wyoming LLC
ROD	Record of Decision
TMC	turning movement counts
TRB	Transportation Research Board
TWSC	two-way stop controlled
WYDOT	Wyoming Department of Transportation

1.0 Introduction

PCW studied traffic on public roads in the vicinity of the CCSM Project Site to identify potential impacts from construction, operations, maintenance and decommissioning. This traffic study accounts for:

- Existing traffic levels;
- CCSM Project deliveries and workforce commuting;
- PCW's transportation pan; and
- New and improved infrastructure proposed for the CCSM Project.

To complete the traffic analysis, traffic profiles were created and reviewed for the peak years during construction, operations, maintenance and decommissioning of the CCSM Project. The CCSM Project peak years are estimated to be the following:

- 2015 (Construction Year Two): peak of construction traffic before the West Sinclair Rail Facility begins operations
- 2016 (Construction Year Three): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project South Entrance
- 2017 (Construction Year Four): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project North Entrance
- Operations and Maintenance Typical Year: significant peaks are not anticipated during operations and maintenance
- Decommissioning Year Two: peak of decommissioning traffic

Following establishment of the CCSM Project peak years, peak traffic hours were identified and evaluated. A common method for evaluating the effectiveness of transportation infrastructure against traffic volumes is by level of service (LOS). Defined within the *Highway Capacity Manual* (HCM) (TRB 2010), the LOS rating system is a measure of motorist perception of travel time, traffic density, and delay. Ratings range from LOS A (free flow, very low density, no delays) to LOS F (highly restricted flow, very high density, significant delays). Evaluation of the peak traffic hours for the CCSM Project determined instances during construction where traffic generated by the CCSM Project may exceed the capacity of the nearby road network causing the level of service at some intersections to exceed LOS D. As such, PCW identified methods for mitigating these instances. Outside of peak hours, traffic will be far lower and is not expected to change current conditions or levels of service; therefore, off-peak traffic mitigation is not necessary.

In determining traffic effects of the CCSM Project, this traffic study evaluates only the traffic directly generated by the CCSM Project. Traffic caused indirectly by the CCSM Project due to induced businesses or other socioeconomic effects is not included due to the uncertainty of what that indirect traffic may be. However, while the traffic study focuses only on direct effects, it was designed to be conservative. The study assumes that workers commuting to and

from the CCSM Project Site will commute during existing peak hours and that the construction schedule each year will be compressed based on the BLM timing stipulations in the ROD. While it is not likely that the CCSM Project morning and evening commuting peak will coincide with the current local peaks or that all timing stipulations in the ROD will apply each year and in all locations, PCW intentionally applied these assumptions to create a more conservative analysis.

2.0 Existing Traffic

PCW conducted an infrastructure analysis to identify roads in the vicinity of the CCSM Project Site that may be used in connection with the CCSM Project, i.e. for deliveries or workforce commuting (Attachment A to the CCSM Project Transportation Management Plan). Once the type and locations of the roads around the CCSM Project Site were identified, PCW evaluated the current use of these roads, including traffic volumes and traffic operations, as described below.

2.1 Volume

As part of this traffic study, PCW performed an analysis of the existing traffic conditions in the vicinity of the CCSM Project Site. Existing traffic volume data was collected at multiple key intersections along potential travel routes through Rawlins and Sinclair during the morning (AM) and evening (PM) peak weekday hours. The data collected in December 2008 for these intersections included turning movement counts (TMC) and daily traffic data. Additional average daily traffic (ADT) volumes for the summer were collected in August 2010.

The TMC data provide distribution information for vehicles entering and exiting key intersections to determine the existing travel patterns in the area. The intersections where counts were taken are all public roads, including the Interstate 80 on- and off-ramps at exits 211, 214, and 221, and several intersections that may be affected by construction traffic along US287 and WY71, as shown in Figure 1 of Exhibit A (Traffic Volume Diagrams). The figure also shows the number of vehicles making each movement during the existing AM and PM peak hours. These volumes serve as the basis for the existing conditions analysis.

Daily counts are used to identify the average daily through-traffic along a corridor throughout an entire day. Table 1 shows the bi-directional (eastbound plus westbound, or northbound plus southbound) daily traffic volumes at several locations near the CCSM Project Site. These values represent a typical weekday traffic level for the road. The daily counts shown in Table 1 were extrapolated from data collected by PCW in December 2008 and August 2010, and data collected by WYDOT in 2009 (WYDOT 2009).

Table 1. Daily Count Data

Count Location	Nearby Intersection	December ADT	August (Peak) ADT
Interstate 80 at MP 208.65[1]	Spruce Street interchange	9,000[3]	14,400[3]
Spruce Street[1]	West of 4th Street	5,500[3]	9,100[3]
WY71	South of Interstate 80 bridge	250[2]	450[4]
WY76	North of truck stop	N/A	490[4]
WY76	North of westbound off-ramp	N/A	1,830[4]
CR407 (CIG Road)	South of Interstate 80	N/A	120[4]

Notes: [1] http://www.dot.state.wy.us/home/planning_projects/Traffic_Data.default.html
[2] Collected in 2008
[3] Collected in 2009
[4] Collected in 2010

Based on the assumption that peak hour traffic volumes are roughly 10 percent of daily totals, Interstate 80 is expected to have traffic volumes of approximately 1,500 vehicles per hour in both directions (375 passenger cars/hour/lane (pc/h/ln)), assuming equal distribution) at peak times. Using the HCM methodology, a four-lane interstate like Interstate 80 (two lanes in each direction) with an estimated free flow speed of 70 miles per hour has a maximum capacity of 770 pc/h/ln to maintain a LOS A rating, and 1,690 pc/h/ln to maintain the minimally acceptable LOS C rating. For this analysis, 375 pc/h/ln is clearly within the LOS A rating.

According to the HCM, two-lane highways have a typical capacity of 1,700 passenger cars per hour per direction to maintain a LOS C rating or better. The ADT volume on WY71, based on data collected in December 2008, is 450 vehicles, which is a LOS A rating and well under capacity for a two-lane highway.

In addition to the data shown in Table 1, PCW collected daily traffic volumes at two locations between September and November of 2010 and between April and October of 2011 to determine the traffic fluctuations due to seasonal and recreational traffic. These additional counts were collected at WY71 just south of Interstate 80 overpass (2010 only), and CR401 near the proposed Haul Road crossing location.

For the data collected in 2010, a significant peak occurred along WY71 and CR401 during two weekends in October. The maximum volume was nearly 800 vehicles per day on WY71 and 580 vehicles per day at on CR401. The maximum hourly volume during the two-month period of combined northbound and southbound traffic was 60 vehicles per hour on WY71 and 45

vehicles per hour on CR401. These peak traffic volumes were short-lived and only occurred on two weekends in October.

Aside from the two peak weekends in 2010, the ADT on WY 71 was 465 vehicles per day consistent with the data collected in December 2008. On CR401, the ADT in 2010 was 230 vehicles per day with an average combined northbound and southbound peak hour volume of 10 vehicles per hour in the AM peak and 15 vehicles per hour in the PM peak. The data collected over six months in 2011 on CR401 had an even lower daily traffic volume (160 vehicles per day). The 2010 and 2011 data in conjunction with the 2008 data show that even during the peak times, the maximum volume of traffic is still well under the capacity of a two-lane road and WY71 and CR401 operate at a LOS A rating.

2.2 Operating Conditions

In accordance with the HCM, operating conditions on roads are a function of the delay experienced by drivers at intersections. Traffic operations for key signalized and un-signalized intersections in the vicinity of the CCSM Project Site were analyzed using the methods described in the HCM. Essentially, the traffic data were input into analysis software (HCS+ for stop-controlled intersections and Synchro for signalized intersections) to determine the LOS rating. For signalized intersections, the delay for each individual turning movement is evaluated, then approaches are graded, and finally the intersection as a whole is given a single LOS rating. For two-way stop controlled (TWSC) intersections, each intersection is assigned a single LOS rating based on the minor approach with the lowest LOS. Table 2 shows the criteria used to assign a LOS to each intersection.

Table 2. LOS Criteria for Signalized and TWSC Intersections

LOS	Control Delay per Vehicle (sec)	
	Signalized	Unsignalized
A	≤ 10	0 – 10
B	> 10 – 20	> 10 – 15
C	> 20 – 35	> 15 – 25
D	> 35 – 55	> 25 – 35
E	> 55 – 80	> 35 – 50
F	> 80	> 50

The existing average AM and PM peak hour intersection LOS rating and delay (average delay in seconds per vehicle) are listed in Table 3. Based on the results of the analysis, all of the intersections operate at LOS B or better during the peak hours of the day, indicating that there are no existing operational deficiencies. The analysis of the existing operating conditions for roads in the vicinity of the CCSM Project Site did not identify any roads with levels of congestion that warrant additional capacity.

Table 3. Public Intersection LOS Analysis – Existing Conditions (2008)

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	15.0	B	15.5	B
WY71 and Jackson Street	9.0	A	9.0	A
WY71 and Washington Street	9.1	A	9.3	A
WY71/Locust Street and South Higley Boulevard	10.1	B	10.1	B
Interstate 80 EB and Spruce Street	9.2	A	10.6	B
Interstate 80 WB and Spruce Street	8.9	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.3	B	10.4	B
Interstate 80 WB and South Higley Boulevard	11.2	B	11.9	B
Interstate 80 EB and WY76	9.1	A	9.2	A
Interstate 80 WB and WY76	8.7	A	8.8	A
Interstate 80 WB and Johnson Road	9.4	A	10.2	B
Interstate 80 EB and Johnson Road	10.3	B	11.7	B
Notes: [1]Signalized intersection				

3.0 Construction Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during construction. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

3.1 Construction Traffic

To understand the potential effects of CCSM Project operations and maintenance traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. PCW has defined two general types of trips generated by the CCSM Project during construction:

1. The delivery of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

3.1.1 Deliveries

PCW intends to bring much of the construction materials, components and equipment to the CCSM Project Site via rail. These items will arrive at the West Sinclair Rail Facility and will be off-loaded to an adjacent laydown yard for storage until they are transported by truck to locations within the CCSM Project Site. The vehicles and equipment necessary to transport deliveries from off-site, as well as from the West Sinclair Rail Facility are described below.

Wind Turbine Components

Each complete wind turbine generator (WTG) consists of three or four tower sections, three blades, a nacelle, a hub, a rotor cover, and smaller miscellaneous parts and equipment. PCW estimates that the majority of WTG components (approximately 80%) will arrive at the CCSM Project Site via the West Sinclair Rail Facility. However, some wind turbine components may not meet railroad requirements and will need to be delivered to the CCSM Project Site by long-distance trucking over public roads. Also, near the end of each construction season there may be instances where some additional components are required to complete the remaining turbines, but not in sufficient quantities to fill a unit train. In those instances, the required components will be transported to the CCSM Project Site using long-distance trucking.

The WTG components that are oversize typically have specialized trailers attached to heavy-haul semi tractors. Nacelles use lowboy/flatbed trailers, often with 19 axles or more. Tower sections may also use flatbed trailers, with base sections often transported using Schnabel-type trailer attachments. Blades will use telescoping trailers and will be transported individually or in pairs. For purposes of this traffic study, it was assumed that blades will be transported individually.

Aggregate

For this traffic study, PCW assumed that aggregate would be hauled by belly-dump trucks with a 24 cubic yard volume. Various classifications of aggregate will be used for the construction of the CCSM Project as described in the Road Rock Quarry Site-specific Plan of Development. Some aggregate will be sourced from the Road Rock Quarry, and some from sources outside the CCSM Project Site. Trucks bringing aggregate from off-site are assumed to enter the CCSM Project Site from Interstate 80, exit 221, the North Entrance.

Additional Materials

A variety of other vehicles will deliver the remaining construction materials required for the CCSM Project. Many, like cement, sand, and fly ash and aggregates needed for the concrete batch plants, will use trucks with dump trailers suitable for the loads they are carrying. Prior to construction of the West Sinclair Rail Facility, materials like steel rebar and electrical components will be transported to the CCSM Project Site on flatbed trailers. After the rail facility is built and becomes operational, these components will be delivered primarily by rail.

In 2014 and 2015, water trucks (likely 12,000 gallon capacity) with dispersion nozzles may haul water from off-site sources likely in Rawlins or Sinclair to the CCSM Project Site. This water will be used for dust control and road construction. After the water facilities within the CCSM Project Site become operational, it was assumed that water will be derived from on-site sources.

Heavy Equipment

Heavy equipment consists of WTG assembly haul trucks, graders, dozers, rippers, backhoes, and front-end loaders, as well as mobile cranes that will be used for WTG erection. These pieces of heavy equipment will be transported to the CCSM Project Site by trucks with suitably-designed trailers such as low boys. There will be a peak of approximately 300 pieces of heavy equipment on the CCSM Project Site during construction. Most of this equipment will be trucked to the CCSM Project Site over the course of the first few months of the construction season and hauled back out at the end of the construction year. It is assumed that once these pieces of heavy equipment are delivered to the CCSM Project Site, they will remain on site until they are no longer required and will be incrementally removed as the demand for heavy equipment winds down over the course of the construction year.

3.1.2 Truckloads

Based on the CCSM Project construction schedule and delivery requirements described above, PCW developed the estimated total number of truckloads required to build the CCSM Project by year (section 6.0 of the Transportation Management Plan). The total truckloads include construction materials, components, and equipment transported to the CCSM Project Site, as well as trips made off-site by personnel in the course of completing their work, i.e. not commuting. The truckloads listed in section 6.0 of the Transportation Management Plan also account for any subsequent hauling of components and materials to their final destination within the CCSM Project Site; including internal movements from the West Sinclair Rail Facility, Road Rock Quarry, water stations, batch plants and laydown areas. On-site trucking was

included in the analysis to evaluate potential impacts to CR401 at the Haul Road crossing. It is important to note that the truckloads are not equivalent to trips, as trucks will need to return to their origin after delivering their load.

3.1.3 Labor Force

Another significant source of traffic during construction of the CCSM Project is the daily commute to the CCSM Project Site by the labor force. PCW expects the labor force to use a variety of personal vehicles to commute to the CCSM Project Site. Once workers arrive on-site, they will use CCSM Project pick-up trucks or vans to move to locations within the CCSM Project Site. Daily commuting traffic is expected to make up between 60 and 80 percent of the total construction traffic. The labor force breakdown included in section 3.2 of the Transportation Management Plan was used to determine the total number of workers arriving at the CCSM Project Site daily during construction.

For purposes of this traffic study, PCW conservatively assumed that the construction labor force will commute each day from the surrounding communities, rather than originating from temporary on-site housing, or using public transportation or local bussing. For purposes of this study, PCW assumed the labor force would be housed in the surrounding communities as:

- 50 percent: Rawlins Area
- 40 percent: East of Rawlins (Laramie area)
- 10 percent: South of Rawlins (Saratoga area)

The percentages are assumed to be constant regardless of the labor force size or year of construction. It is further assumed that each worker will make one trip to and one trip from the CCSM Project Site per day. For the workers traveling from outside the Rawlins area, it is assumed that there will be 1.5 workers per vehicle due to carpooling.

For workers originating in Rawlins, the general assumptions made regarding what parts of town they would be coming from (based upon locations of residential properties and hotels) are:

- 56 percent: Near 287/Cedar
- 24 percent: South of Railroad, north of Interstate 80
- 20 percent: Near Spruce Street

PCW intends to allow the construction workforce to report to whichever CCSM Project Site entrance is closest to their work, i.e. the North Entrance off Interstate 80 at Exit 221 (Figure 1) or the South Entrance off CR401 (Figure 2). To support the traffic study, PCW developed an estimate of the construction workforce that would muster at each entrance based on the yearly construction schedule (Table 4).

3.1.4 Other

While there will likely be other types of traffic associated with construction of the CCSM Project (e.g., courier deliveries and inspections), such traffic is not of sufficient volume to affect the traffic study findings and was therefore not considered in the analysis.

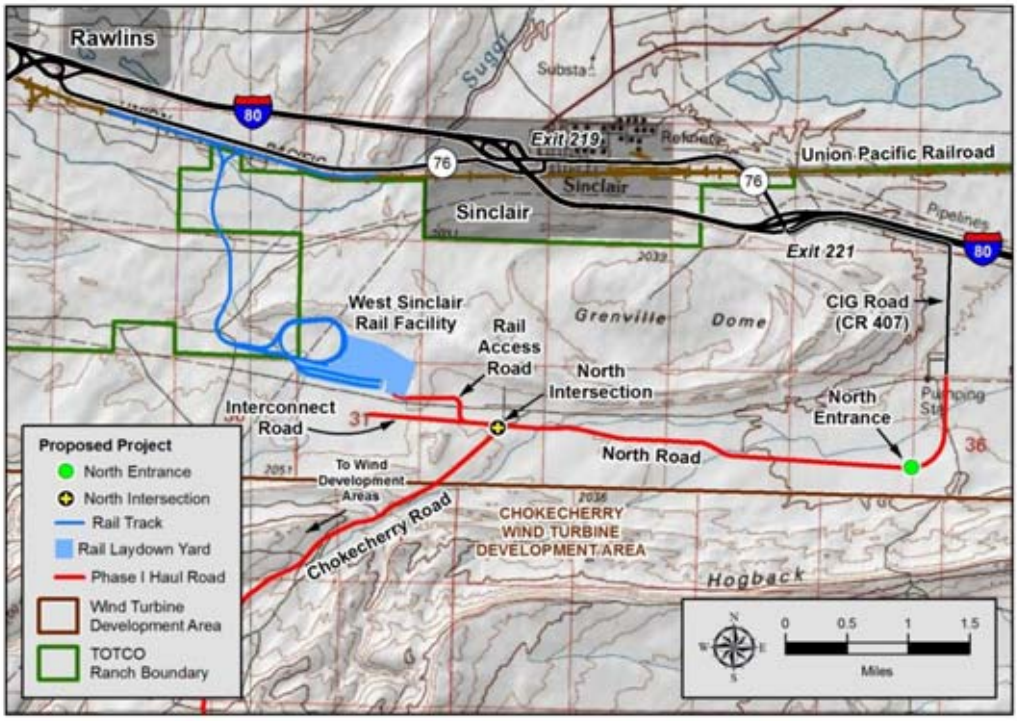

Figure 1. CCSM Project North Entrance

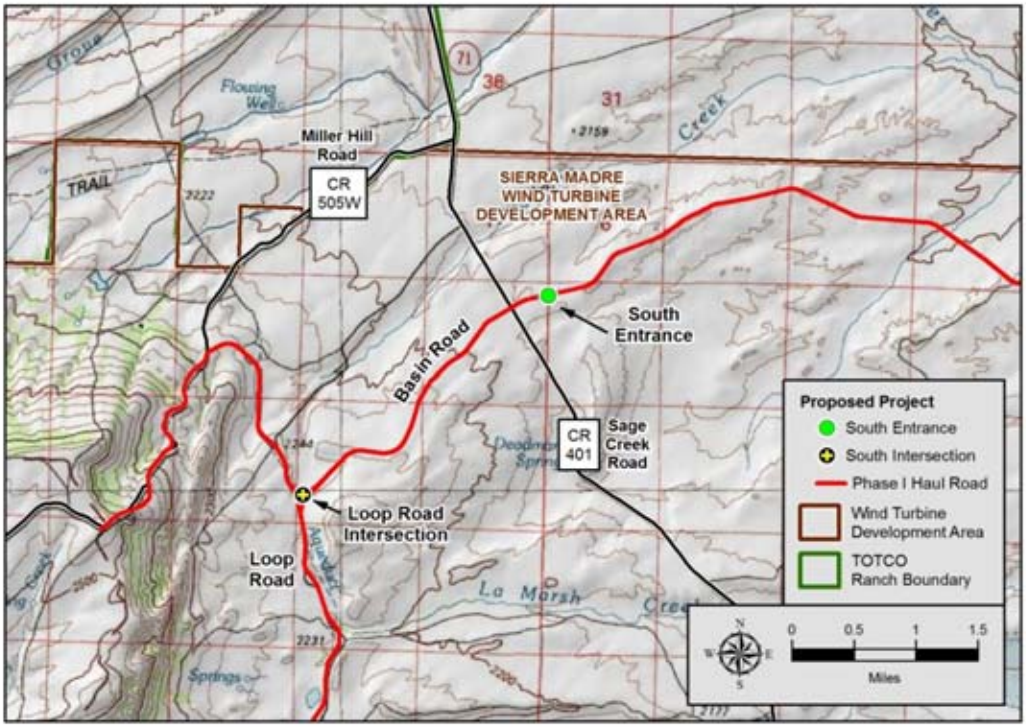

Figure 2. CCSM Project South Entrance

Table 4. Percent of Workforce By Entrance

Year (during peak)	North Entrance	South Entrance
2014	82%	18%
2015	31%	69%
2016	30%	70%
2017	78%	22%
Phase II Year 1	26%	74%
Phase II Year 2	37%	63%
Phase II Year 3	100%	0%

3.2 Daily Traffic Projection

Based on the construction traffic analysis and the CCSM Project schedule, a projection of the average daily traffic during construction of the CCSM Project was created. Using the truckload estimate described in section 3.1.2, each truckload was assigned to a month based on the CCSM Project schedule and then truck trips were calculated by assuming that each truckload generates two trips, one delivery and one return. The monthly truck trips were then assumed to be evenly distributed throughout the month and were divided by the total number of working days in each month to determine the daily trips. Similarly, the monthly workforce numbers described in section 3.1.3 were used to determine daily worker trips. The daily commuting trips were generated by assuming that each worker generates two trips (one entering and one exiting) each day. The trips generated by workers outside the Rawlins area were then decreased by one-third to account for carpooling of 1.5 workers per vehicle.

Table 5 and Table 6 show the average daily traffic projection for construction of Phase I and Phase II of the CCSM Project, respectively.

The traffic patterns in 2014 and 2015 differ somewhat from the other construction years due to the availability of the Road Rock Quarry (later in 2014) and the West Sinclair Rail Facility (end of 2015). During this time, the percentage of the CCSM Project traffic related to the transport of construction components and materials is far higher than in later years. To insure that the traffic effects of construction of the CCSM Project were fully analyzed, PCW chose to study the construction traffic impacts of three peak months due to the difference in the traffic characteristics. PCW analyzed the following traffic cases for construction of the CCSM Project:

- 2015 (Construction Year Two): peak of construction traffic before the West Sinclair Rail Facility begins operations

- 2016 (Construction Year Three): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project South Entrance
- 2017 (Construction Year Four): peak of construction traffic with the West Sinclair Rail Facility in operation, and when most of the workforce traffic is using the CCSM Project North Entrance

Table 5. Total Daily Traffic Projection – Phase I Construction

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
2014							
Delivery Trucks[1]	0	0	0	0	37	37	20
Aggregate	*0*	*0*	*0*	*0*	*37*	*37*	*20*
WTG Components[2]	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Deliveries	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Labor Force Commute	0	0	0	0	107	107	107
Total	**0**	**0**	**0**	**0**	**144**	**144**	**127**
2015							
Delivery Trucks[1]	0	0	331	291	183	51	0
Aggregate	0	0	330	285	177	46	0
WTG Components[2]	0	0	0	0	0	0	0
Other Deliveries	0	0	1	6	6	5	0
Labor Force Commute	59	121	408	487	427	309	136
Total	**59**	**121**	**739**	**778**	**610**	**360**	**136**
2016							
Delivery Trucks[1]	14	22	204	188	105	91	0
Aggregate	0	0	171	158	84	81	0
WTG Components[2]	12	21	22	20	11	0	0
Other Deliveries	2	1	11	10	10	10	0
Labor Force Commute	157	926	1,253	1,258	999	392	178

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Total	**171**	**948**	**1,457**	**1,446**	**1,104**	**483**	**178**
2017							
Delivery Trucks[1]	15	22	139	129	91	0	0
Aggregate	0	0	109	101	69	0	0
WTG Components[2]	14	21	22	20	14	0	0
Other Deliveries	1	1	8	8	8	0	0
Labor Force Commute	219	602	1,285	1,290	1,167	560	299
Total	**234**	**624**	**1,424**	**1,419**	**1,258**	**560**	**299**
Notes: [1]Sum of all delivery trucks, including aggregate, WTG components, and other. [2]Excludes pilot cars							

Table 6. Total Daily Traffic Projection – Phase II Construction

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Phase II - Year 1							
Delivery Trucks[1]	0	0	1	45	114	70	0
Aggregate	*0*	*0*	*0*	*44*	*107*	*63*	*0*
WTG Components[2]	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Other Deliveries	*0*	*0*	*1*	*1*	*7*	*7*	*0*
Labor Force Commute	111	144	319	416	356	248	125
Total	**111**	**144**	**320**	**461**	**470**	**318**	**125**
Phase II - Year 2							
Delivery Trucks[1]	65	124	259	259	183	0	0
Aggregate	0	0	146	146	107	0	0
WTG Components[2]	65	100	100	100	63	0	0
Other Deliveries	0	2	13	13	13	0	0
Labor Force Commute	319	917	1,185	1,190	976	461	227

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Total	**384**	**1,041**	**1,444**	**1,449**	**1,159**	**461**	**227**
Phase II - Year 3							
Delivery Trucks[1]	53	102	206	206	158	0	0
Aggregate	0	0	98	98	98	0	0
WTG Components[2]	53	100	100	100	52	0	0
Other Deliveries	0	2	8	8	8	0	0
Labor Force Commute	261	666	1,060	1,065	1,082	516	283
Total	**314**	**768**	**1,266**	**1,271**	**1,240**	**516**	**283**

Notes: [1]Sum of all delivery trucks, including aggregate, WTG components, and other.
[2]Excludes pilot cars

3.3 August 2015 Traffic Case

Using the daily traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction prior to operation of the West Sinclair Rail Facility (August 2015) is presented below.

3.3.1 Trip Generation

The first step in analyzing the traffic impacts to public roads in the vicinity of the CCSM Project Site is to estimate the daily trips required. This data is presented in

Table 5 above for construction of Phase I of the CCSM Project. For the August 2015 traffic case, PCW used the August 2015 data. The daily truck trips were then split into eleven equal hours to signify an even distribution over an eleven-hour work day and the total daily AM worker trips were grouped for the morning peak hour and the total daily PM worker trips were grouped for the evening peak hour. All construction material trips were assumed to occur by truck because the West Sinclair Rail Facility would still be under construction.

3.3.2 Trip Distribution

The origin and destination for each trip was determined for each CCSM Project construction trip in the peak month. Labor force commute trips were determined based upon the origin assumptions and destination options described in Section 3.1.3. During 2015, PCW estimates that 31% of the workforce will commute to the CCSM Project's North Entrance via CIG Road, and 69% will use the Southern Entrance via Sage Creek Road.

3.3.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic levels to allow for analysis of the resulting intersection conditions. Construction delivery vehicles arriving from east or west of Rawlins, were routed on Interstate 80, exiting on WY76 (exit 221), and traveling along CIG Road to the CCSM Project's North Entrance where they accessed the CCSM Project Haul Road. Local aggregate deliveries from off-site were assumed to avoid the City of Rawlins by entering Interstate 80 at exit 209 and then traveling east to exit 221, and then along CIG road to the CCSM Project Haul Road. No delivery traffic was assumed to arrive from south of the CCSM Project Site or north of Rawlins. It was assumed that workers accessing the CCSM Project North Entrance would use CR407 and the workers accessing the CCSM project South Entrance would use CR401.

3.3.4 Analysis Results

Once the turning movement volumes were generated for the existing traffic and the CCSM Project traffic, an operating condition analysis was completed for the peak case of August 2015. The existing plus CCSM Project traffic analysis used the same methods for calculating intersection LOS as described in Section 2.2. The LOS and delay (in seconds per vehicle) resulting from the analysis for the peak of 2015 is listed in Table 7 and shown in Figure 2 of Exhibit A. In 2015, the operations of all intersections will operate at LOS C or better. As such, no mitigation measures will likely be required.

Table 7. Public Intersection LOS Analysis – August 2015 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	14.2	B	16.0	B
WY71 and Jackson Street	16.9	C	14.0	B
WY71 and Washington Street	14.8	B	16.8	C
WY71/Locust Street and South Higley Boulevard	13.4	B	11.0	B
Interstate 80 EB and Spruce Street	9.6	A	10.6	B
Interstate 80 WB and Spruce Street	8.9	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.5	B	13.2	B
Interstate 80 WB and South Higley Boulevard	11.2	B	12.9	B
Interstate 80 EB and WY76	10.5	B	12.6	B
Interstate 80 WB and WY76	9.1	A	10.1	B

Interstate 80 WB and Johnson Road	9.6	A	10.4	B
Interstate 80 EB and Johnson Road	10.6	B	12.0	B
Notes: [1]Signalized intersection				

3.4 July 2016 Traffic Case

Using the traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction during the highest month of construction activity (July 2016) while the majority of the workforce is using the South Entrance is presented below. This analysis used the same process described in Section 3.3.

3.4.1 Trip Generation

Peak hour workforce commuting and delivery trips were determined in the same manner described in Section 3.3 using the July 2016 data from Table 5.

3.4.2 Trip Distribution

PCW determined the likely origin and destination for each CCSM Project construction trip based on the type of component or material. Labor force commuting trips were determined based on the assumptions described in Section 3.1.3. During 2016, PCW estimates that 30% of the workforce will commute to the CCSM Project North Entrance via CR407, and 70% will use CR401 to reach the CCSM Project South Entrance. The truck deliveries were assumed to use the CCSM Project North Entrance.

3.4.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic to allow analysis of road operating conditions. The majority of the construction delivery vehicles arriving from east or west of Rawlins, were routed on Interstate 80, exiting on WY76 (exit 221), and traveling along CIG Road to the CCSM Project's North Entrance where they accessed the CCSM Project Haul Road. A small number of delivery vehicles were assumed to arrive from north of Rawlins, using the US287 bypass to Cedar Street, then onto Interstate 80 east to exit 221, and then to CR407 and the CCSM Project Haul Road. No delivery traffic was assumed to arrive from south of the CCSM Project Site. Trucks destined for the Miller Hill area of the Sierra Madre wind development area were assumed to use the Haul Road and cross CR401.

3.4.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2016 case are listed in Table 8 and associated traffic volumes are shown in Figure 3 of Exhibit A. The operating conditions for most of the intersections are at LOS C or better with the addition of project traffic for both peak periods, meaning no mitigation measures for these intersections should be required.

The WY71 intersections at Jackson Street and Washington Street may see significant wait times during both morning and evening commutes, and the intersection at Locust Street/South Higley Boulevard are expected to be at LOS D during the morning peak. Additionally, the Interstate 80 eastbound ramp at South Higley Boulevard is anticipated to be at LOS D during the evening commute. The intersections with LOS D and F ratings will be mitigated as described in Section 6.0.

Table 8. Public Intersection LOS Analysis – July 2016 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	13.3	B	16.8	B
WY71 and Jackson Street	**884.6**	**F**	**51.2**	**F**
WY71 and Washington Street	**425.8**	**F**	**135.4**	**F**
WY71/Locust Street and South Higley Boulevard	**25.9**	**D**	13.7	B
Interstate 80 EB and Spruce Street	10.2	B	10.6	B
Interstate 80 WB and Spruce Street	9.0	A	9.8	A
Interstate 80 EB and South Higley Boulevard	10.8	B	**29.4**	**D**
Interstate 80 WB and South Higley Boulevard	12.9	B	15.4	C
Interstate 80 EB and WY76	14.6	B	20.3	C
Interstate 80 WB and WY76	9.7	A	12.2	B
Interstate 80 WB and Johnson Road	9.5	A	10.3	B
Interstate 80 EB and Johnson Road	10.6	B	11.9	B
Notes: [1]Signalized intersection				

3.5 July 2017 Traffic Case

Using the traffic projection from section 3.2 and the existing conditions defined in section 2.0, PCW studied the effects of the CCSM Project construction on the public roads in the vicinity of the CCSM Project Site. The analysis for the peak of construction during the highest month of construction activity (July 2017) while the majority of the workforce is using the North Entrance is presented below. This analysis used the same process described in Section 3.3.

3.5.1 Trip Generation

Peak hour workforce commuting and delivery trips were determined in the same manner described in Section 3.3 using the July 2017 data from Table 5.

3.5.2 Trip Distribution

PCW determined the likely origin and destination for each CCSM Project construction trip based on the type of component or material. Labor force commuting trips were determined based on the assumptions described in Section 3.1.3. During 2017, PCW estimates that 78% of the workforce will commute to the CCSM Project North Entrance via CR407, and 22% will use CR401 to reach the CCSM Project South Entrance. The truck deliveries were assumed to use the CCSM Project North Entrance.

3.5.3 Trip Assignment

Trip assignments are the same as those described in section 3.4.3.

3.5.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2017 case are listed in Table 9 and associated volumes are shown in Figure 4 of Exhibit A. The Interstate 80 eastbound exit at Wyoming Highway 76 was found to have an LOS F rating during both the morning and afternoon peaks, and the westbound ramp at the same intersection also had a LOS F rating during the afternoon peak. The intersections with LOS F ratings will be mitigated as described in section 6.0.

Table 9. Public Intersection LOS Analysis – July 2017 Peak

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	12.2	B	19.0	B
WY71 and Jackson Street	15.1	C	13.1	B
WY71 and Washington Street	14.6	B	15.8	C
WY71/Locust Street and South Higley Boulevard	15.3	C	12.8	B
Interstate 80 EB and Spruce Street	12.7	B	10.6	B
Interstate 80 WB and Spruce Street	9.3	A	10.3	B
Interstate 80 EB and South Higley Boulevard	12.1	B	12.6	B
Interstate 80 WB and South Higley Boulevard	12.5	B	13.8	B
Interstate 80 EB and WY76	**960.1**	**F**	**271.0**	**F**
Interstate 80 WB and WY76	14.8	B	**52.2**	**F**
Interstate 80 WB and Johnson Road	9.5	A	10.2	B
Interstate 80 EB and Johnson Road	10.4	B	11.7	B
Notes: [1]Signalized intersection				

4.0 Operations and Maintenance Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during operations and maintenance. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

4.1 Operations and Maintenance Traffic

To understand the potential effects of CCSM Project operations and maintenance traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. They types of trips generated during operations are likely to be the same as those generated during construction; however they will be substantially smaller in volume. PCW has defined two general types of trips generated by the CCSM Project during operations and maintenance:

1. The delivery of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

4.1.1 Types of Trips

During operations and maintenance, the traffic expected on a daily basis will be almost entirely from the labor force, either reporting to and from the site or making trips during the business day. Some additional deliveries of large components will occur at times, however not on such a frequent basis as to affect the daily traffic patterns of the surrounding public roads. To create a conservative analysis, PCW assumed that the entire operations and maintenance labor force would commute to the CCSM Project Site from Rawlins.

4.1.2 Labor Force

PCW is estimating that the Project will have a staff of approximately 114 full-time employees during operations. The labor force is expected to commute to the CCSM Project Site using personal vehicles. For the purposes of this traffic study, it was assumed that all labor force traffic will use Interstate 80 exit 221 to access the CCSM Project Site. Trips made by the labor force during the business day are expected to occur in Project pick-up trucks. Additional trips caused by deliveries to the CCSM Project Site will be few in number and occur only on an as-needed basis.

4.2 Operations and Maintenance Typical Year Traffic Case

Based on the operations and maintenance activities and the type of traffic anticipated, PCW estimated the volume of traffic generated by the CCSM Project and the subsequent effects on the public roads in the vicinity of the CCSM Project Site. This analysis used the same process described in Section 3.3.

4.2.1 Trip Generation

Traffic during CCSM Project operations and maintenance is not expected to have significant peaks; therefore, PCW performed the traffic analysis on a typical day. This included the daily commute of 114 employees, which for the purposes of this traffic study are assumed to work a single shift, meaning all workers arrive to and depart from the site during the same peak hours. PCW also assumed that the labor force may make additional trips to and from the CCSM Project Site to the surrounding communities during the business day. Assuming each employee makes two such off-site trips per day, these would not occur during the peak hour and would not change the peak traffic levels; therefore, the peak commuting hours were the volumes used in this analysis.

4.2.1 Trip Distribution

For purposes of this analysis, PCW assumed that 100 percent of the operations and maintenance workforce will commute to the CCSM Project North Entrance.

4.2.2 Trip Assignment

It was assumed that workers accessing the CCSM Project North Entrance would use CR407.

4.2.3 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the July 2017 case are listed in Table 10 and associated volumes are shown in Figure 5 of Exhibit A. The analysis concluded that the operations for all intersections studied are at LOS B or better, which indicates that operations and maintenance of the CCSM Project will have little overall effect to the public roads in the vicinity of the CCSM Project Site and that no mitigation measures are required.

Table 10. Public Intersection LOS Analysis – Operations

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US287 Bypass/Higley Boulevard and 3rd Street	10.1	B	10.1	B
US287 Bypass/Higley Boulevard and Cedar Street[1]	13.9	B	16.3	B
WY71 and Jackson Street	9.0	A	9.0	A
WY71 and Washington Street	9.2	A	9.4	A
WY71/Locust Street and South Higley Boulevard	10.5	B	10.5	B
Interstate 80 EB and Spruce Street	9.8	A	10.6	B
Interstate 80 WB and Spruce Street	9.0	A	9.7	A
Interstate 80 EB and South Higley Boulevard	10.6	B	10.4	B
Interstate 80 WB and South Higley Boulevard	11.6	B	11.7	B
Interstate 80 EB and WY76	9.1	A	11.5	B
Interstate 80 WB and WY76	8.7	A	8.8	A
Interstate 80 WB and Johnson Road	9.4	A	10.2	B
Interstate 80 EB and Johnson Road	10.3	B	11.7	B
Notes: [1]Signalized intersection				

5.0 Decommissioning Traffic Effects

After analyzing the existing traffic on the roads in the vicinity of the CCSM Project Site, PCW evaluated the effects of traffic generated by the CCSM Project during decommissioning. This section includes a description of the type of traffic that will be generated by the CCSM Project and an evaluation of the CCSM Project traffic effects.

5.1 Decommissioning Traffic

To understand the potential effects of CCSM Project decommissioning traffic, PCW evaluated the type and amount of traffic the CCSM Project is expected to generate. They types of trips generated during decommissioning are the same as those generated during construction; however, since the CCSM Project's decommissioning is anticipated to occur in thirty years, existing traffic volumes were inflated by 2 percent to account for growth in the region. This growth rate is based on growth projections for Carbon County by the Wyoming Department of Administration and Information. PCW has defined two general types of trips generated by the CCSM Project during decommissioning:

1. The delivery and removal of equipment, components, service vehicles, and materials to the CCSM Project Site; and
2. The daily commute of the labor force to the CCSM Project Site.

5.1.1 Material/Component Requirements

The vehicles and equipment necessary to transport the decommissioning material, components, equipment, and labor force to and from the CCSM Project Site are assumed to be the same as those for construction, as described in section 3.1.

Table 11 below lists the estimated total number of truckloads required to decommission the CCSM Project, consistent with values in the EIS. These truckloads include the materials, components, and equipment to be removed from the site, as well as trips made off-site by decommissioning personnel.

For the purposes of this analysis, it is assumed that decommissioned turbine components and related materials will leave the site by truck and that the truckloads for the materials that can be recycled (steel towers, nacelles, cables) will be divided evenly, with roughly half travelling east on Interstate 80 and the other half travelling west on Interstate 80. Materials going to landfill were assumed to all travel west on Interstate 80 based upon current information regarding landfill options.

The on-site truckloads in Table 11 represent the movement of materials within the CCSM Project Site. Water trucks will move water from water stations to areas within the CCSM Project Site for dust control and revegetation. Neither the water nor aggregate truckloads are anticipated to affect the level of service at public road intersections.

TOTCO has requested that all aggregate removed from decommissioned roads be left on-site and stockpiled on TOTCO property for use during maintenance of Ranch roads. Aggregate trucks will move decommissioned aggregate to stockpiles near the Rail Facility and Operations Center sites. This was used as the base case in the analysis; however, PCW also evaluated the potential impacts if the decommissioned aggregate was removed off-site to a location near Interstate 80 exit 209. While there was a slight increase in delay there was no change in the LOS; therefore, only the base case is discussed below in section 5.2.4.

Table 11. Total Truckloads of Project Decommissioning Material

Items	Year 1	Year 2	Year 3	TOTAL
Loads Moved Off-Site				
Wind Turbine Components	5,220	5,220	4,560	**15,000**
Concrete Removal	2,231	2,148	1,862	**6,242**
Collection System Cables/Structures	81	82	71	**233**
Transmission Line Cables/Structures	644	647	559	**1,850**
Substation Components	20	54	36	**110**
Buildings/Trailers	30	20	30	**80**
Other Materials	3,719	2,960	3,321	**10,000**
Equipment Removal	1,180	1,180	1,180	**3,540**
Personnel Off-Site Trips	439	329	47	**815**
TOTAL REMOVED	**13,563**	**12,639**	**11,667**	**37,869**
On-Site Loads				
Aggregate	19,038	29,041	40,822	**88,900**
Water	2,715	2,715	2,715	**8,145**

5.1.2 Labor Force

The other significant source of traffic during decommissioning of the CCSM Project will be the daily commute to the CCSM Project Site by the labor force. Daily commuting traffic is expected to make up over 90 percent of the peak hour CCSM Project decommissioning traffic. Based on current estimates of required workers, this traffic study assumed the breakdown in Table 12 for the total labor force during decommissioning.

The routing options for the CCSM Project decommissioning workforce are assumed to be the same as those for the CCSM Project construction (section 3.1.3); however, given the lower labor force requirements, PCW made the conservative assumption that only the CCSM Project North Entrance, Interstate 80 exit 221, would be used by the decommissioning labor force.

Table 12. Peak Decommissioning Labor Force by Month

Month	Year 1	Year 2	Year 3
July	378	379	374
Aug	387	396	382
Sep	380	396	385
Oct	378	295	376
Nov	369	355	368

5.2 Decommissioning Year Two Traffic Case

Based on the decommissioning activities and the type of traffic anticipated, PCW estimated the volume of traffic generated by the CCSM Project and the subsequent effects on the public roads in the vicinity of the CCSM Project Site. This analysis used the same process described in Section 3.3.

5.2.1 Trip Generation

The estimated daily off-site trips required for each month of the CCSM Project decommissioning is provided in Table 13. The highest overall volumes of traffic occur in October of Year Two, with an average of 927 off-site vehicles trips per day. Approximately 85 percent of the traffic is due to the labor force commute, with nearly 400 trips for the AM and PM commutes. The remaining 126 daily trips associated with material removal and are assumed to occur throughout the work day. It is important to note that half of all truckloads for all decommissioning vehicles will be empty, so only half of the oversized truckloads traveling over structures will be heavy loads.

Table 13. Total Daily Traffic Projection – Decommissioning

Traffic Type	Trips						
	May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**
Decommissioning Year One							
Removal Trucks[1]	0	0	103	105	127	142	128
Labor Force Commute	0	0	757	773	761	757	739
Total	**0**	**0**	**860**	**878**	**888**	**899**	**867**
Decommissioning Year Two							
Removal Trucks[1]	0	0	101	100	122	136	122
Labor Force Commute	0	0	757	793	793	791	710
Total	**0**	**0**	**858**	**893**	**915**	**927**	**832**
Decommissioning Year Three							
Removal Trucks[1]	0	0	90	92	116	126	122
Labor Force Commute	0	0	748	764	770	751	737
Total	**0**	**0**	**838**	**856**	**886**	**877**	**859**

Notes: [1]Sum of removal trucks, including those removing WTG components, and other material and equipment.

5.2.2 Trip Distribution

The origin and destination of each decommissioning trip in the peak month was determined based on the type of load. Labor force commute trips were determined based upon the origin assumptions and destination options described in Section 3.1.3. To create a conservative traffic analysis, it was assumed that all workers would report to the CCSM Project North Entrance. Long haul truck trips directional estimates on Interstate 80 are as described in section 5.2.1.

5.2.3 Trip Assignment

After trips were distributed between likely origins and destinations, they were assigned to specific roads and added to existing traffic to allow analysis of operational conditions during the CCSM Project decommissioning. Decommissioning vehicles departing to the east or west of Rawlins were assumed to travel CIG Road to Interstate 80 exit 221 (WY76). A small amount of vehicle traffic was assumed to depart to the north using the US287 bypass. No traffic was assumed to depart to the south of the CCSM Project Site.

5.2.4 Analysis Results

The LOS and delay (in seconds per vehicle) resulting from the decommissioning year two case are listed in Table 14 and associated volumes are shown in Figure 6 of Exhibit A. While the delay at one intersection (Interstate 80 westbound at South Higley Boulevard) did extend to LOS D, the operations for all other intersections studied are at LOS C or better. Due to the conservative assumptions used in the analysis, PCW does not anticipate that mitigation measures will be required during decommissioning; however, if mitigation measures are required they will be implemented as described in section 6.0 using any experience gained during construction.

Table 14. Public Intersection LOS Analysis – Decommissioning

Intersection	Morning Peak (AM)		Afternoon Peak (PM)	
	Delay (sec)	LOS	Delay (sec)	LOS
US 287 Bypass/Higley Boulevard and 3rd Street	12.9	B	13.2	B
US 287 Bypass/Higley Boulevard and Cedar Street	14.9	B	20.9	C
WY71 and Jackson Street	9.6	A	9.6	A
WY71 and Washington Street	10.0	A	10.4	B
WY71/Locust Street and South Higley Boulevard	13.3	B	13.2	B
Interstate 80 EB and Spruce Street	11.1	B	14.8	B
Interstate 80 WB and Spruce Street	9.4	A	11.6	B
Interstate 80 EB and South Higley Boulevard	13.7	B	13.8	B
Interstate 80 WB and South Higley Boulevard	19.8	C	30.8	**D**
Interstate 80 EB and WY76	16.1	C	21.8	C
Interstate 80 WB and WY76	10.4	B	15.2	C
Interstate 80 WB and Johnson Road	10.0	B	12.1	B
Interstate 80 EB and Johnson Road	11.9	B	17.3	C
Notes: [1]Signalized intersection				

6.0 Potential Mitigation Options

Using the traffic analysis described above, PCW identified potential effects to the public roads in the vicinity of the CCSM Project Site due to the CCSM Project's expected. Based on the traffic

analysis, PCW anticipates that four intersections during the July 2016 case and two intersections during the July 2017 case will receive LOS ratings of D or lower ratings and will require mitigation.[1] PCW has explored options to mitigate and improve these LOS ratings, and determined that the use of active traffic control and shifting traffic to off-peak times are both effective mitigation techniques. PCW anticipates that these options will be sufficient to avoid the need for any temporary or permanent changes to the affected intersections to mitigate traffic levels, although some temporary geometric improvements may be necessary to accommodate oversize truck deliveries (Appendix A to the Transportation Management Plan).

6.1.1 Active Traffic Control

For purposes of the traffic analysis, PCW assumed the existing traffic control measures would remain in effect. For every intersection where service was estimated to drop to an LOS D rating or lower, the intersections are controlled through stop signs rather than traffic lights. Delays at these intersections were due mostly to large truck deliveries, and high traffic volumes from workforce commuting. Trucks making deliveries of large materials or components (often oversize or heavy) are slow to accelerate and generally make wide turns compared to passenger vehicles. One of these trucks completing a turn will cause traffic in all other directions to stop for several seconds until the truck clears the intersection. This combined with higher-than-typical traffic volumes caused by workforce commuting was anticipated to lead to the longer delay times at the affected intersections.

One of the most common and effective methods for mitigating these types of traffic delays is active traffic control. Flaggers are typically used to manage the flow of traffic and avoid the longer delays. Flaggers can see trucks approaching an intersection and stop traffic in other directions to keep the truck moving, thereby avoiding the long delay of the truck starting from a complete stop. The use of flaggers also avoids the inherent delay caused by all vehicles needing to come to a stop at an intersection with four-way stop signs.

Whenever a significant volume of CCSM Project traffic is using the Haul Road and crossing CR401, PCW expects to use flaggers to control this intersection. PCW intends to instruct the flaggers to favor stopping CCSM Project traffic when public vehicles arrive rather than the reverse. This will minimize any delays to the public traffic while having little effect on CCSM Project traffic as the volume of public traffic on CR401 is very low.

Due to limitations within the available traffic analysis software, PCW was not able to directly quantify the effect that flaggers will have on intersection traffic; however, experience has shown that the ability of flaggers to be flexible and adaptive in traffic management by allowing longer queues of vehicles to clear intersections as needed is superior to the addition of temporary timed traffic lights.

[1] While a LOS D rating was identified at one intersection during decommissioning, this is likely due to the conservative assumptions of the analysis and not mitigation is anticipated to be required during decommissioning.

6.1.2 Shifting Traffic to Off-Peak Times

The traffic analysis determined that the LOS rating impacts of the studied intersections was caused primarily by the entire workforce commuting to the CCSM Project Site over the same one hour period as the existing peak traffic, an intentionally conservative assumption. During peak periods of the CCSM Project construction, the number of workers reporting to the CCSM Project Site at the same time involves more vehicles than the intersections are designed to accommodate. An option identified by PCW would be to stagger the start- and end-shift times for the labor force on the CCSM Project. Rather than requiring the entire labor force to report to the site at the same time, PCW examined the effect of dividing the shift into two equal groups, with the second starting and ending one hour later than the first. As shown in Table 15 and Figures 7 and 8 of Exhibit A, the effect of this change onto the Interstate 80/WY76 intersection was dramatic, reducing the delay times substantially and improving the expected LOS at significantly impacted intersections one or two levels during the peak traffic times.

Based on these results, PCW does not anticipate further mitigation measures will be required; however, if wait times during construction are found to significantly exceed expectations, PCW will explore additional mitigation measures such as three start times, carpooling or bussing the members of the workforce (especially those commuting from Laramie) and restricting all truck deliveries to off-peak times.

Table 15. Level of Service Improvements Due To Mitigation

Intersection	Peak Time	Single Start		Staggered Start	
		Delay (sec)	LOS	Delay (sec)	LOS
July 2016 Peak Case					
WY71 & Jackson St.	Morning Peak	>880	F	28.8	D
WY71 & Jackson St.	Afternoon Peak	>50	F	16.9	C
WY71 & Washington St.	Morning Peak	>425	F	24.0	C
WY71 & Washington St.	Afternoon Peak	>135	F	22.0	C
WY71 & Locust/S. Higley	Morning Peak	>25	D	14.9	B
Interstate 80 EB & S. Higley	Afternoon Peak	>25	D	10.4	B
July 2017 Peak Case					
Interstate 80 EB & Hwy 76	Morning Peak	>960	F	21.1	C
Interstate 80 EB & Hwy 76	Afternoon Peak	>270	F	28.4	D
Interstate 80 WB & Hwy 76	Afternoon Peak	>52	F	14.3	B

7.0 References

Transportation Research Board (TRB). 2010. Highway Capacity Manual 2010. Transportation Research Board of the National Academies. January 2010

Wyoming Department of Transportation (WYDOT). 2009. Traffic Data. http://www.dot.state.wy.us/home/planning_projects/Traffic_Data.default.html. Accessed July 16, 2013.

Exhibit 1

Traffic Volume Diagrams

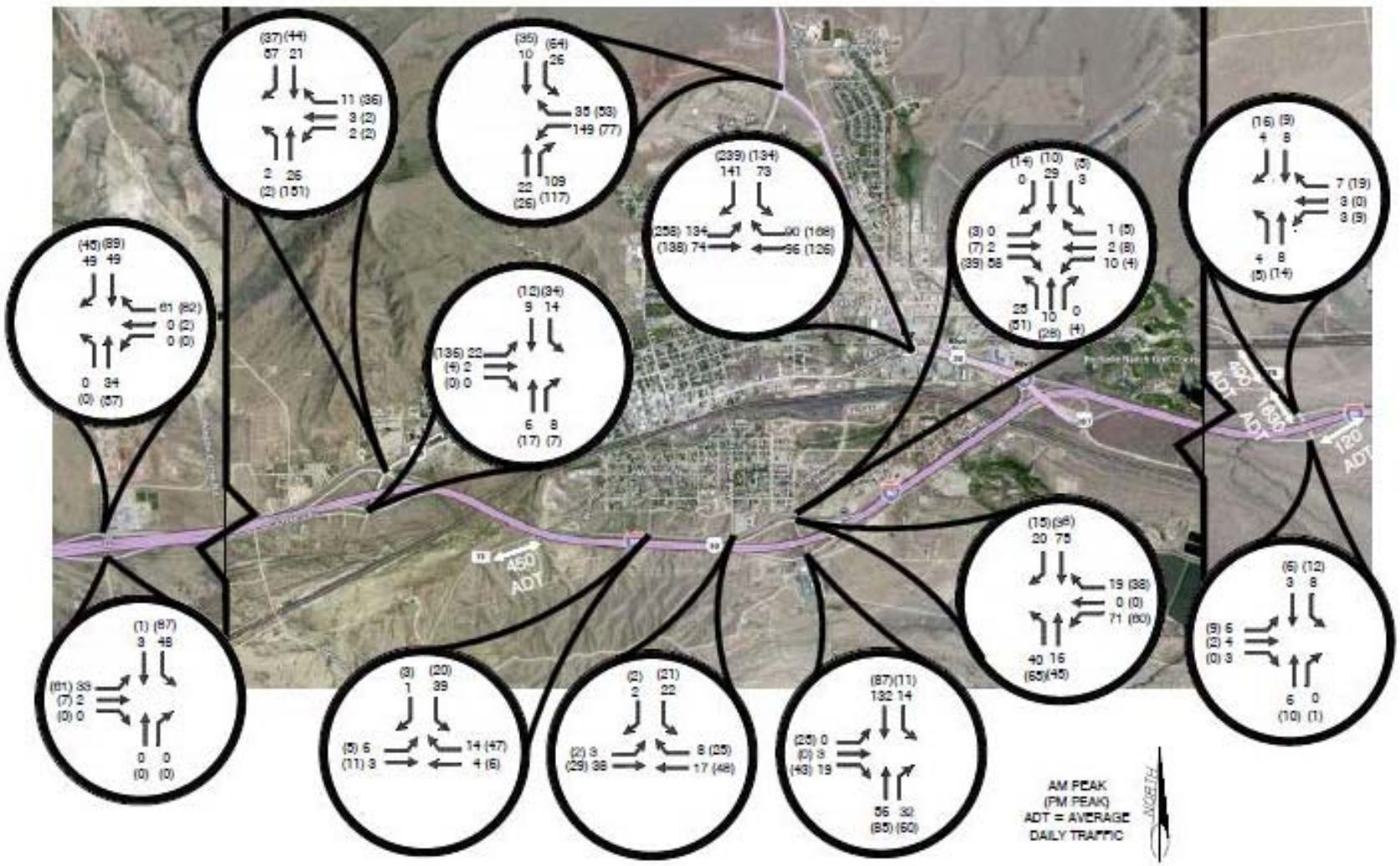

Figure 1. Traffic Volumes - Existing

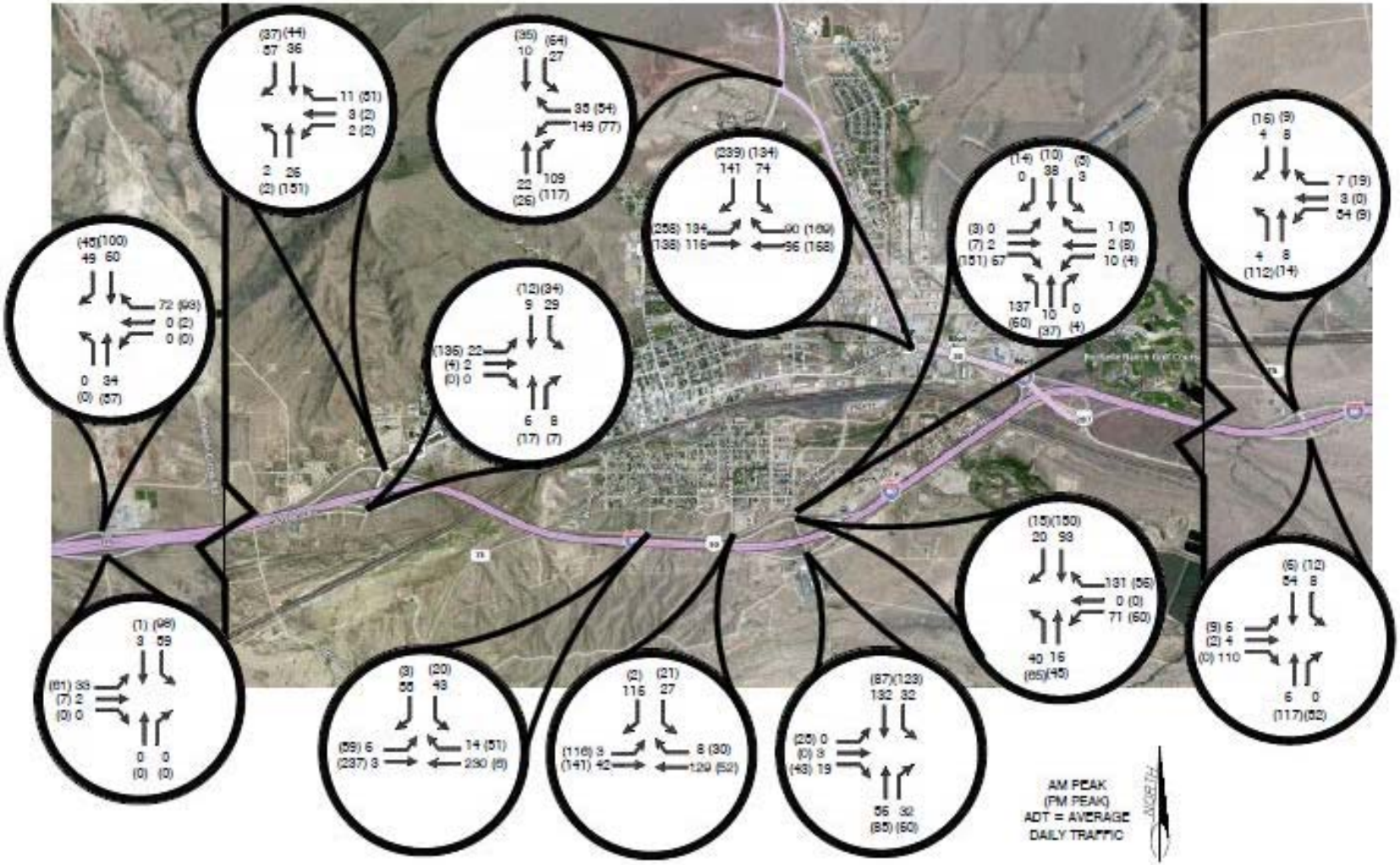

Figure 2. Traffic Volumes – Construction Year 2015 (August)

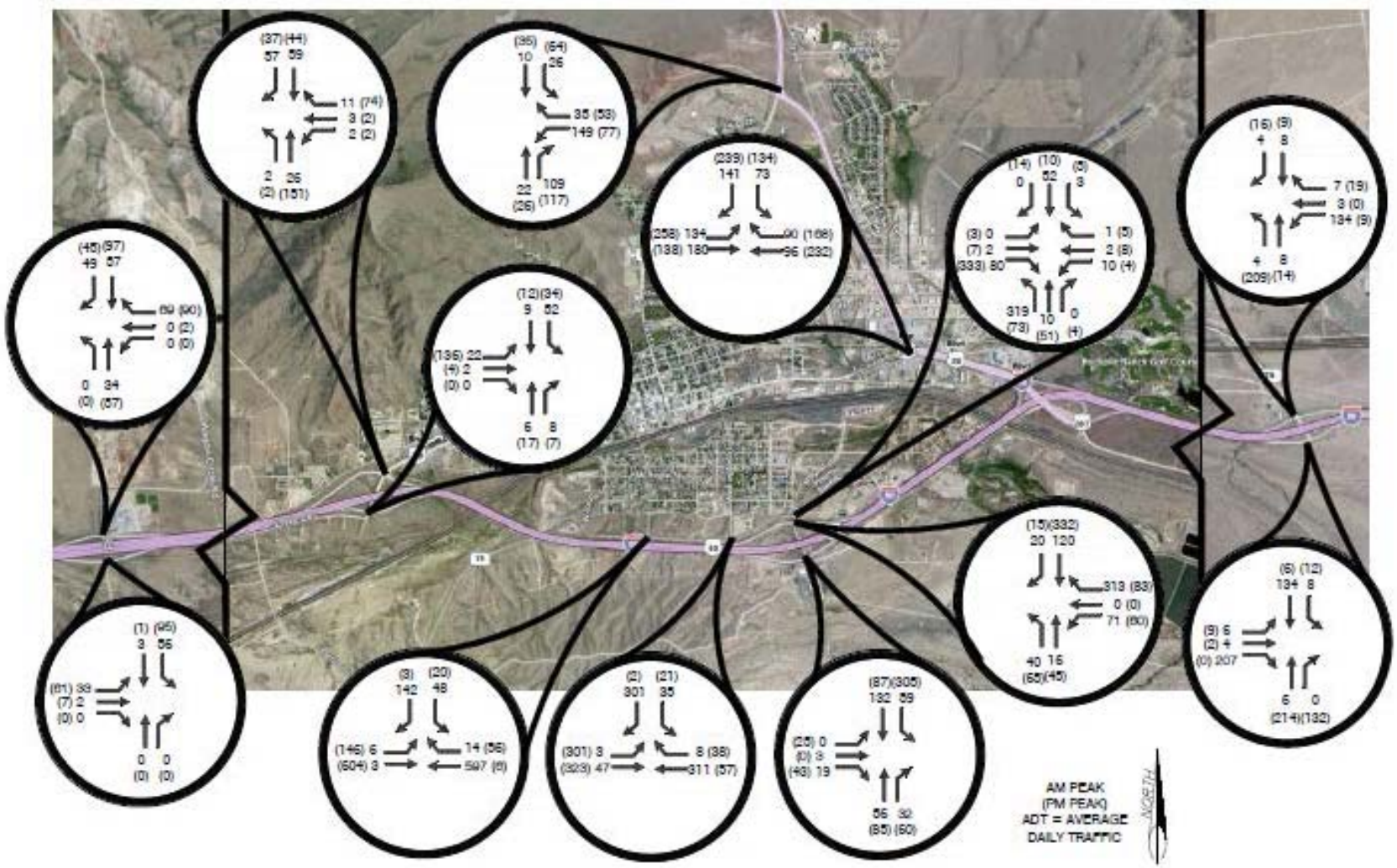

Figure 3. Traffic Volumes – Construction Year 2016 (July)

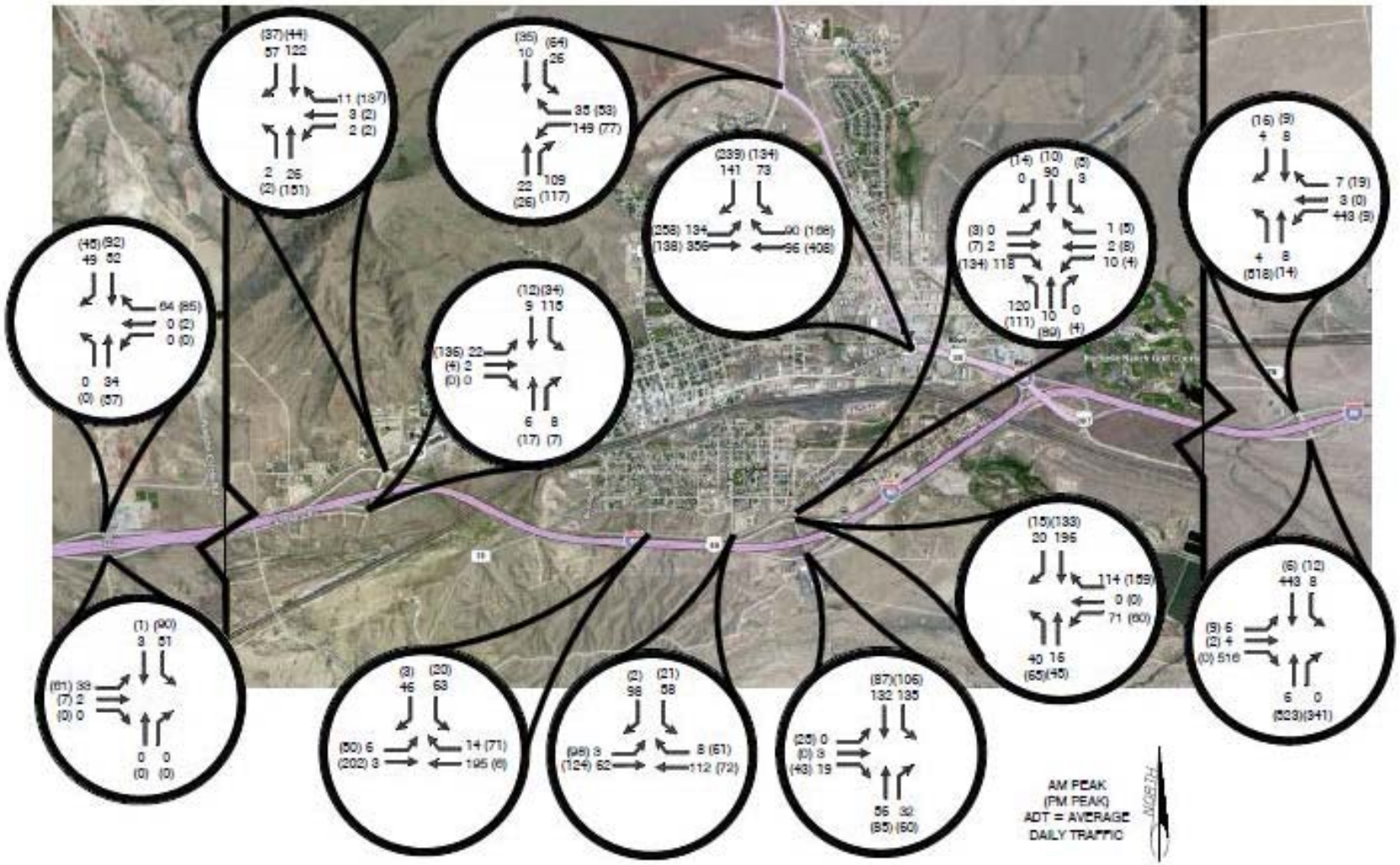

Figure 4. Traffic Volumes – Construction Year 2017 (July)

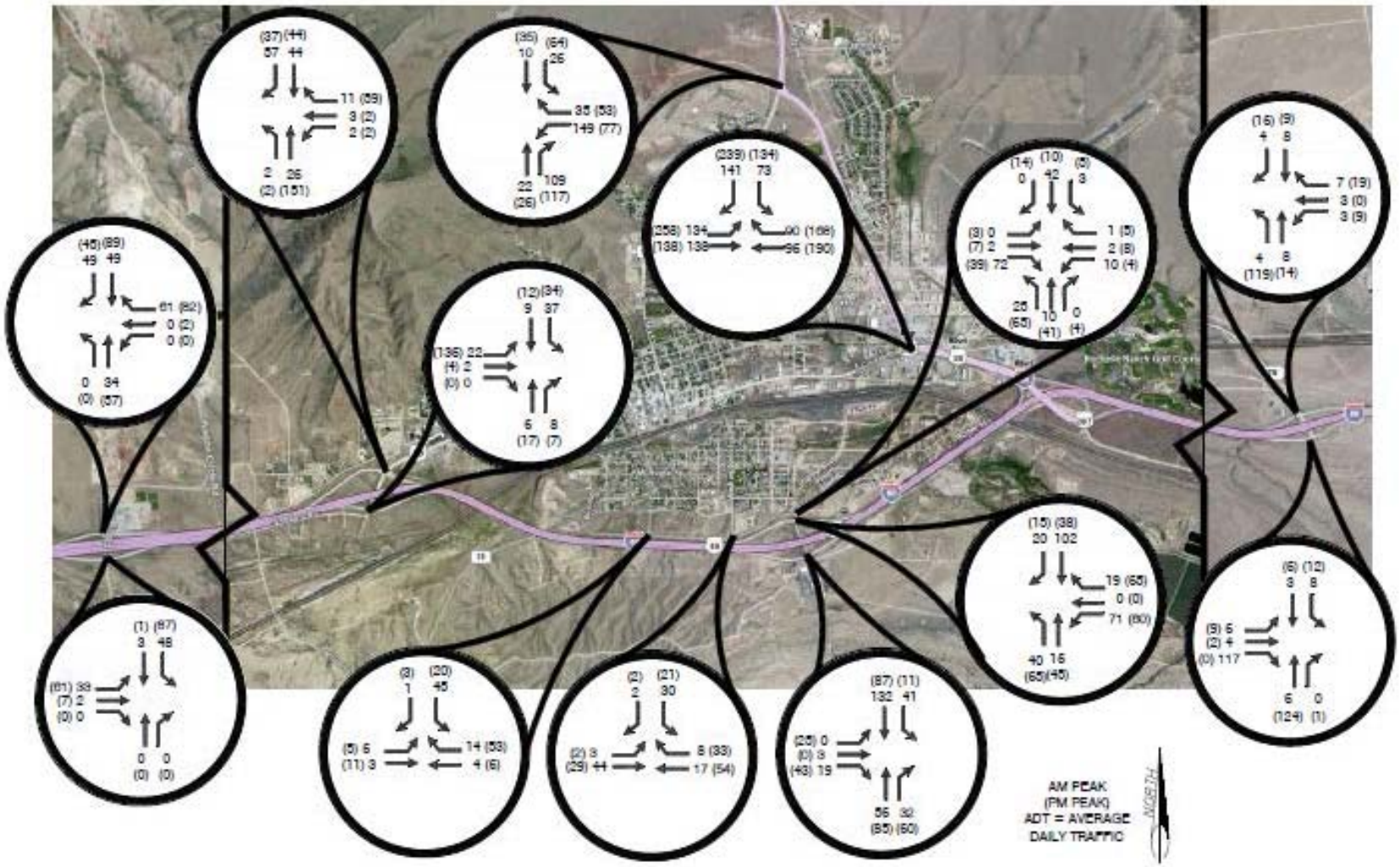

Figure 5. Traffic Volumes – Operations and Maintenance

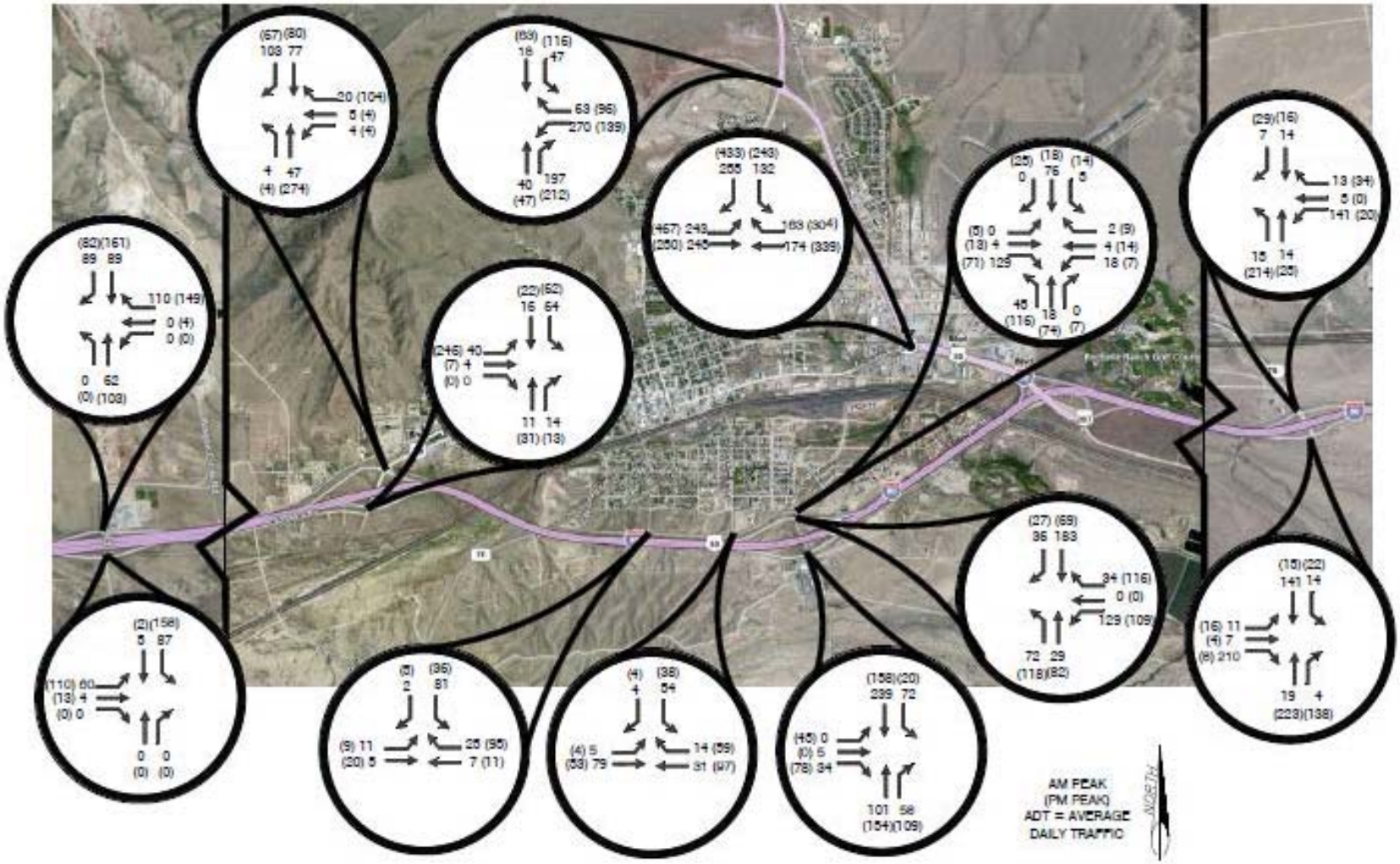

Figure 6. Traffic Volumes – Decommissioning Year Two Peak

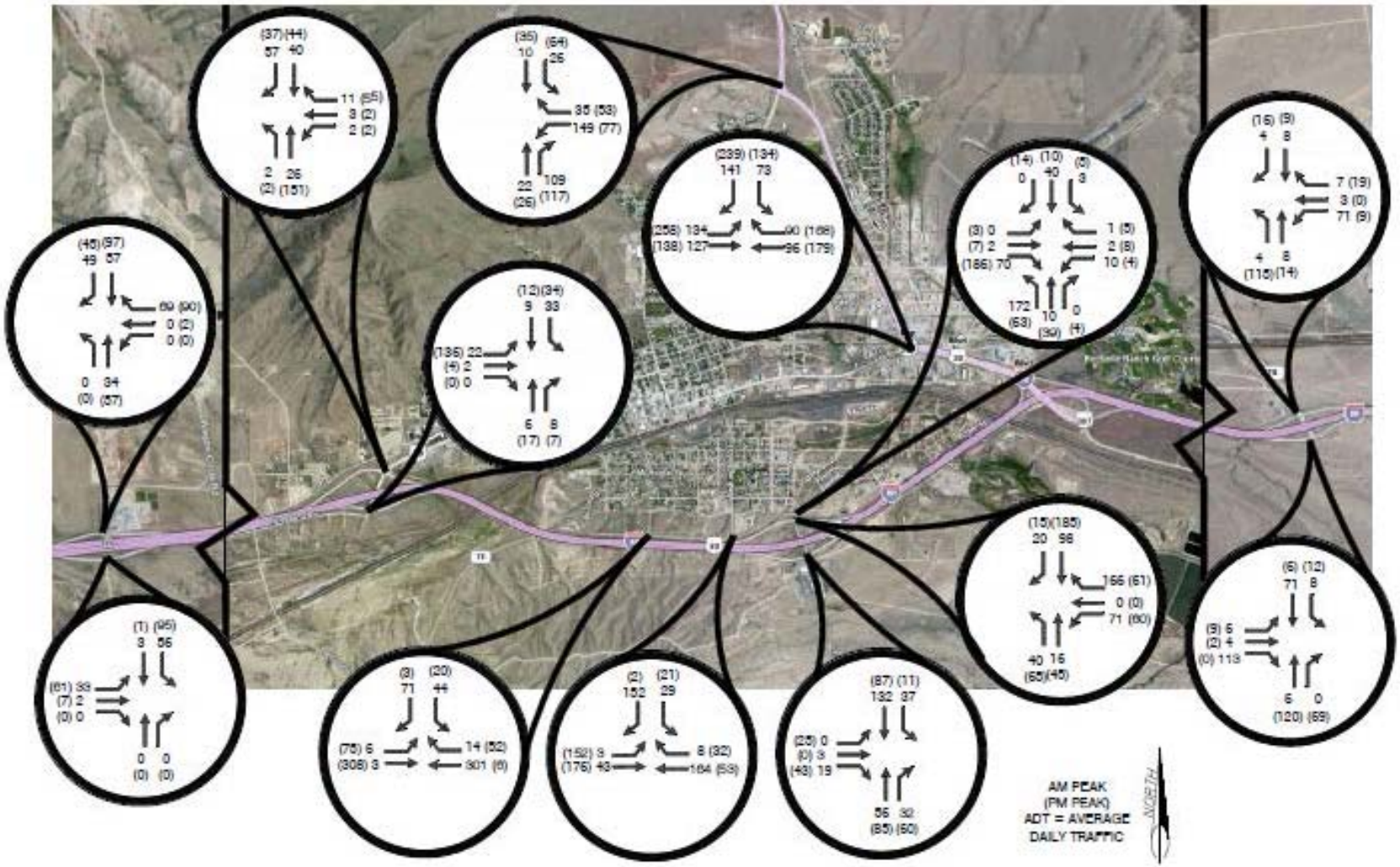

Figure 7. Traffic Volumes – Construction Year 2016 (July) with Staggered Shifts

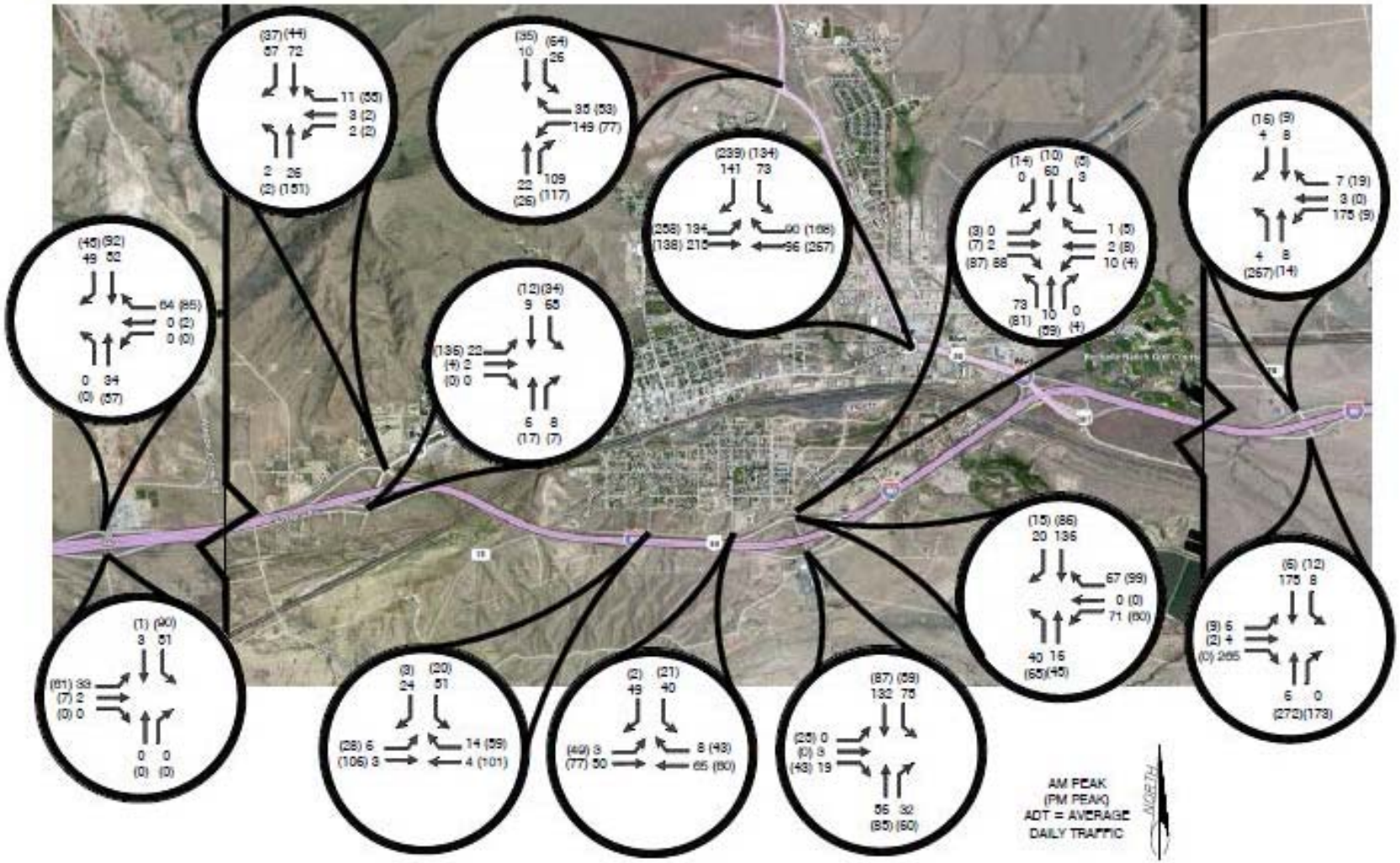

Figure 8. Traffic Volumes – Construction Year 2017 (July) with Staggered Shifts

APPENDIX E

Chokecherry and Sierra Madre Wind Energy Project

Winter Access Plan

555 Seventeenth Street
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Denver, CO 80202

September 2013
(Updated March 2014)

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal lands within the CCSM Project Site. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Site are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

This Winter Access Plan (Plan) describes PCW's strategy for maintaining access to the CCSM Project components listed above during winter conditions. During the winter months, the CCSM

Project Site is known to have periods of significant snowfall and drifting. To effectively operate and maintain the CCSM Project, some limited access to the CCSM Project components will be required during winter conditions. PCW intends to first minimize the need for winter access and then use the methods and strategies described below to access the CCSM Project components as required. PCW will update and modify this Plan as needed to address the changing conditions and requirements of the CCSM Project. PCW will apply adaptive management principles to winter access, using any lessons learned in subsequent plan updates.

2.0 STRATEGY

To provide access to the CCSM Project components during winter conditions while minimizing impacts, PCW will apply the following strategies:

1. Conduct preventative maintenance prior to winter;
2. Stage winter access vehicles (snow cats or equivalent) in strategic locations (e.g. Lower Miller Hill) to provide access without snow removal;
3. Equip select CCSM Project pick-up trucks with snow plows; and
4. Perform snow removal on roads only as needed.

3.0 METHODS

The primary method for maintaining access to CCSM Project components during winter conditions is to clear snow from road and facility surfaces. PCW will use pick-ups, as well as larger snow plow trucks (Ford F-650 or similar) when needed, to clear snow from roads and facilities.

When snow is removed from the driving surface of a road, PCW will attempt to maintain at least a 24 foot clearance on haul-class roads, a 16-feet clearance on arterial, turbine, and facility-class roads, and 12-foot clearance on structure-class roads. Snow removed from roads will be pushed to the shoulder of the road along the edge of the driving surface where possible. When snow piled along the shoulder of the road becomes sufficiently deep, escape openings for big game will be provided every one-quarter mile or less. For snow removal at facilities, snow will be pushed to a location within the facility site where it will not interfere with access.

As an alternative to snow removal, winter access to some CCSM Project components will be accomplished using winter access vehicles, such as snow cats, snow machines (snowmobiles), or equivalent. PCW will use winter access vehicles where access is required over a relatively short distance (5 miles or less). Winter access vehicles will only be used when sufficient snow cover exists to allow the machines to operate effectively; if snow cover is not sufficient, PCW will clear snow as described above.

Over time, operating experience on the CCSM Project will identify locations where snow drifts are likely to occur. PCW may elect to place snow fences upwind of these locations to limit drifting and reduce snow clearing requirements. If snow fences are used, they will be limited to segments of one-quarter mile or less to facilitate the exit of big game.

4.0 IMPLEMENTATION

PCW will implement the winter access strategy and methods for the CCSM Project components as described in Table 1. As PCW gains operating experience on the CCSM Project Site, the measures and strategies listed for each component will be reviewed and updated as required to accomplish efficient and safe winter access to the CCSM Project components.

Table 1. Component-specific Winter Access Measures

Component	Measure
Wind Turbines and Pads	PCW will schedule preventative maintenance for wind turbines prior to winter, to the extent practicable. If preventative maintenance cannot feasibly be completed prior to winter, PCW will attempt to schedule winter maintenance for turbines in areas that are easier to access during winter conditions. For wind turbine work during winter conditions, turbine pads will only be cleared to the extent required to support the activities. Unless required by the work activities, snow clearing would be limited to that required to access the turbine and would not include the entire turbine pad.
Haul Road	The Haul Road is the primary access route for the CCSM Project Site; as such, PCW will clear snow from the Haul Road throughout the winter as appropriate to the road conditions and activity level on-site.
'Other Roads'	Arterial, turbine, facility, and structure-class roads will only be cleared to provide access to turbines and other project elements when required; however, some arterial roads that provide access to large portions of the CCSM Project Site may be cleared more proactively, similar to the Haul Road.
Buildings	All buildings for the CCSM Project (Operations Center, Chokecherry Maintenance Building and Sierra Madre Maintenance Building) are located along or near the Haul Road and/or public roads. Access to each building will be maintained throughout the winter. Since access to the CCSM Project buildings will be maintained, snow plows and winter access vehicles will likely be stored at each location to facilitate winter access throughout the remainder of the CCSM Project.
West Sinclair Rail Facility	When the West Sinclair Rail Facility is in operation during winter conditions, access will be maintained by clearing snow from the access road and active portions of the facility similar to the Haul Road and buildings. When the West Sinclair Rail Facility is not in operation, access to the facility during winter conditions will be established and maintained only as needed.
Road Rock Quarry	PCW does not anticipate that the Road Rock Quarry will operate during winter conditions; however, if the Road Rock Quarry is operated during the winter, access will be maintained by clearing snow from the access road and active portions of the facility similar to the Haul Road and buildings. When the quarry is not in operation, access to the facility during winter conditions will be established and maintained only as needed.
Substations	PCW will maintain access to the CCSM Project substations throughout the winter, similar to the Haul Road and Buildings, for safety.
Water Stations	PCW will keep at least one CCSM Project water station functional during the winter; access will be established only as needed.
North Platte River Extraction	The river extraction facility will not be operated during the winter; therefore River Road will not be cleared and no access will be available.

APPENDIX F

Chokecherry and Sierra Madre Wind Energy Project

Environmental and Construction Compliance Monitoring Plan

Prepared by

Power Company of Wyoming LLC

555 Seventeenth Street

Suite 2400

Denver, CO 80202

Submitted to

Bureau of Land Management
Rawlins Field Office

Rawlins, Wyoming

August 2013

(Updated March 2014)

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Attachment C	BLM Authorized Officer Weekly Report
Attachment D	Certification of Completion of Worker Environmental Awareness Program
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ACRONYMS AND ABBREVIATIONS

AO	Authorized Officer (BLM)
BLM	Bureau of Land Management
BO	Biological Opinion
CCSM	Chokecherry and Sierra Madre
CM	Compliance Manager (PCW)
ECCMP	Environmental and Construction Compliance Monitoring Plan
ECM	Environmental Compliance Monitor
EIS	Environmental Impact Statement
MW	Megawatts
NEPA	National Environmental Policy Act
PCW	Power Company of Wyoming LLC
PM	Project Manager
POD	Plan of Development
RFO	Rawlins Field Office
ROD	Record of Decision
SPCC	Spill Prevention Control and Countermeasures Plan
SWPPP	Stormwater Pollution Prevention Plan
TOTCO	The Overland Trail Cattle Company LLC
USFWS	United States Fish and Wildlife Service
EAP	Worker Environmental Awareness Program

1.0INTRODUCTION

1.1 BACKGROUND

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project) to. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The CCSM Project has a proposed life of 30 years after which, subject to market conditions, the CCSM Project may be repowered as necessary to continue its operations. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO, and the federal lands are administered by the BLM Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for ROW grants to construct, operate, maintain, and decommission the CCSM Project on federal lands within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final Environmental Impact Statement (EIS) concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD.

1.2 PURPOSE

The BLM requires holders of ROW grants to prepare and fund an environmental and construction compliance monitoring program to ensure compliance with the BLM terms, conditions, and stipulations in the ROW grants, the Plan of Development, and required mitigation as provided for in the ROD. The ROD requires PCW to develop an Environmental and Construction Compliance Monitoring Plan (ECCMP) for the CCSM Project. The purpose of this ECCMP is to establish a program to address the requirements found in the ROD, including Appendix C "*Project Permitting and BLM Tiering Procedures*" and Appendix D "*Summary of BLM Environmental Constraints, Applicant Committed Measures, Applicant Committed Best Management Practices, and Proposed Mitigation Measures*."

To implement the ECCMP, PCW will establish an ECCMP Team consisting of BLM, PCW and contractor representatives, as described in Section 3. The ECCMP Team will be responsible for ensuring compliance with the conditions and requirements of the CCSM Project environmental permits and approvals, including implementation of this ECCMP and communication and coordination with the appropriate regulatory agencies. The ECCMP Team will also be responsible for the recordkeeping and reporting required by the CCSM Project permits and approvals and will update the environmental documents and plans as needed.

This ECCMP includes the following:

- Description of the responsibilities of the ECCMP Team including the Environmental Compliance Monitor hired to report findings to the BLM;
- Outline of the level of effort anticipated from the ECCMP Team in implementing this ECCMP;
- Definition of the decision-making authority of the ECCMP Team;
- Description of the ECCMP Team's participation in PCW's Environmental Awareness Program (EAP); and
- Discussion of the CCSM Project monitoring, reporting, and documentation requirements, stop work authority, and the variance process.

This ECCMP is intended to be adaptive. With concurrence from the BLM Authorized Officer, PCW may modify this plan as needed to address changing conditions and requirements.

2.0OBJECTIVES OF THE ENVIRONMENTAL AND CONSTRUCTION COMPLIANCE MONITORING PROGRAM

For projects on federal lands, BLM is responsible for insuring compliance with NEPA and the terms and conditions of the ROW grant (which includes the site-specific plans of developments; other federal, state, and local permits; and Project construction drawings and staking plans). The environmental requirements to be monitored for the CCSM Project include measures that either: (1) apply to federal lands or (2) result from federal oversight of a program or resource (e.g. National Historic Preservation Act and Endangered Species Act). These requirements include the environmental provisions of the following, as applicable:

- ROD and ROW grants;
- Final approved site-specific plans of development;
- U.S. Fish and Wildlife Service's (USFWS) Biological Opinion (BO) or letter of concurrence for listed endangered or threatened federal species or their habitat;
- Approved treatment plan(s) for the treatment and protection of cultural resources;
- Approved environmental compliance and management plans, including the final versions of the Stormwater Pollution Prevention Plan (SWPPP) and the Spill Prevention Control and Countermeasure (SPCC) Plan; and
- Permits and approvals from other authorizing federal, state or local environmental agencies.

A list of the major permits, approvals, and authorizations necessary to construct, operate, maintain, and decommission the CCSM Project is provided in Table 1-2 of the EIS.

The objective of this ECCMP is to provide direction to the ECCMP Team regarding environmental compliance, including compliance inspections and evaluating and documenting compliance with the CCSM Project environmental measures and conditions during Project construction. The roles and responsibilities of the ECCMP Team are set forth in Section 3.

The objectives of the ECCMP Team are to:

- Facilitate the timely resolution of compliance issues;
- Provide information to the BLM and other agencies and parties, as authorized, regarding compliance issues and their resolution;
- Review, process, and track construction-related changes to the CCSM Project POD, site specific plan of development and environmental plans; and
- Develop and implement a system for storing the information collected during implementation of the ECCMP that allows for easy retrieval of information.

This ECCMP focuses on the construction of the CCSM Project; prior to commencement of commercial operation, a separate environmental compliance monitoring plan will be issued by PCW to address the operation and maintenance of the CCSM Project. Construction activities not related to environmental compliance are not considered part of this plan. Examples include but are not limited to, items such as structural design, material inspection or quality control requirements, schedule, and pricing.

3.0ENVIRONMENTAL COMPLIANCE MONITORING AND MANAGEMENT

3.1 CONSTRUCTION PLAN

In the event PCW receives the necessary ROW grants and all other applicable federal, state and local permits and approvals, PCW plans to develop the CCSM Project in two phases. Phase I requires the installation of a nameplate capacity of at least 1,500 MW of wind energy generation facilities (approximately 500 turbines). Construction of Phase I of the CCSM Project (CCSM Phase I) is scheduled to begin in the second half of 2014. Completion of construction and commencement of commercial operation of Phase I is scheduled for 2017. Construction of Phase II of the CCSM Project (CCSM Phase II), consisting of development of the remainder of the CCSM Project, is anticipated to follow completion of Phase I.

Prior to issuing ROW grants, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

Each site-specific plan of development will contain engineering and natural resource data describing site-specific conditions and activities in the detail necessary to allow BLM to evaluate and analyze site-

specific impacts. Appropriate avoidance, minimization, and mitigation measures will be applied consistent with the ROD and ROW grants.

3.2 COMPLIANCE MONITORING AND MANAGEMENT

To implement the ECCMP, PCW will establish an ECCMP Team consisting of BLM, PCW and contractor representatives. The ECCMP Team will be responsible for ensuring compliance with the conditions and requirements of the CCSM Project environmental permits and approvals, including implementation of this ECCMP and communication and coordination with the appropriate regulatory agencies.

The BLM representatives on the ECCMP Team are as follows:

> BLM Authorized Officer (AO): The BLM official with the administrative authority for issuance of ROW grants and authority for accepting and approving CCSM Project changes. The BLM AO may approve Level 1, Level 2 and Level 3 variances.
>
> BLM Project Manager: The BLM staff level position designated by the AO as the point of contact for compliance issues. The BLM Project Manager may approve Level 1 and Level 2 variances.
>
> Environmental Compliance Monitor (ECM): The third-party contractor team, consisting of a manager and a full-time field monitor, under the direct supervision and control of the BLM (funded by PCW during construction of the CCSM Project). The ECM will provide weekly reports directly to the BLM and will be authorized to address proposed/needed deviations from ROW grant stipulations and the approved site-specific plan of development associated with the ROW grant for minor variances (Level 1 variances) after consulting with the BLM Project Manager to expedite construction while protecting resource values. The ECM will consult with the BLM Project Manager, or his/her designated representative, to determine if a variance will require amendment to the site-specific plans of development or the BLM ROW grant.

The PCW representatives on the ECCMP Team are as follows:

> PCW Project Manager: The person designated by PCW as responsible for all construction related activities at the CCSM Project Site. The PCW Project Manager will be the senior PCW official on-site who is authorized to represent PCW. The PCW Project Manager will be responsible for coordination and communication between PCW, contractors, BLM, landowners and agency personnel regarding environmental compliance for the CCSM Project. The PCW Project Manager will oversee implementation of the ECCMP. The PCW Project Manager will be authorized to prepare and submit Level 1, Level 2 and Level 3 Variance Requests.
>
> Construction Contractor Project Manager (Contractor PM): The senior on-site manager for the lead construction contractor for the CCSM Project. The Contractor PM will communicate and coordinate with PCW, BLM, landowners and agency personnel regarding environmental compliance for the CCSM Project, as directed by the PCW Project Manager.
>
> PCW Compliance Manager (CM): The on-site manager designated by PCW as responsible for routine environmental compliance inspections and monitoring. The CM will communicate

regularly with the PCW Project Manager to ensure compliance with the CCSM Project environmental requirements. The CM will be authorized to prepare and submit Level 1 and Level 2 variance requests to BLM. The Environmental Compliance Inspectors will report directly to the CM.

In addition to communicating with the PCW Project Manager and managing Level 1 and Level 2 variances, the CM responsibilities include:

- Conferring with the BLM Project Manager and the ECM on a regular basis;
- Communicating with Inspectors regularly to obtain/verify environmental guidance and evaluate implementation of environmental requirements;
- Supervising monitoring activities, documentation, and schedules;
- Reviewing daily reports submitted by the Inspectors;
- Preparing and submitting weekly reports to the ECM;
- Ensuring that all reported noncompliance is tracked for resolution by PCW;
- Implementing the environmental training program; and
- Interacting with regulatory agencies as directed by the PCW Project Manager.

<u>Environmental Compliance Inspectors (Inspectors):</u> On-site personnel under the direction of the CM responsible for implementing the compliance program pursuant to this ECCMP. The number of Inspectors may vary during construction of the CCSM Project depending upon the types and levels of activity occurring but will be sufficient to ensure that this EECMP is implemented. Construction activities, especially those in environmentally sensitive areas, will be regularly inspected to ensure protection of resources in accordance with the environmental requirements. Inspectors may include the following disciplines, as appropriate to the work activity and location:

- *Biological Resources*. The biological resource inspector will monitor construction activities in areas that have been identified as having sensitive biological resources, including known locations of threatened, endangered, or sensitive species and/or habitat. Monitoring will occur as defined in the Wildlife Monitoring and Protection Plan, Appendix G of the ROD. The CM will coordinate with the biological resource inspector to ensure that appropriate monitoring is maintained as needed throughout the CCSM Project.
- *Cultural Resources*. In the event of a discovery of cultural resources or as set forth in approved treatment plans, the cultural resource inspector will be assigned to implement the provisions of the CCSM Project Programmatic Agreement, as applicable. The CM will coordinate with the cultural resource inspector during construction to ensure compliance with all cultural resource stipulations set out in the ROW grant (including the site-specific plans of development and appendices).
- *Paleontological Resource Inspectors*. If any vertebrate fossils or scientifically important fossils are discovered during construction activities, PCW will cease activities immediately and notify the BLM Project Manager so the agency can determine the significance of the discovery. The BLM will evaluate the discovery and notify PCW what action will be taken with respect to such discoveries. It may be necessary for a paleontological resource inspector to monitor construction activities in areas surrounding significant fossil discoveries within the CCSM Project Site.

Upon mutual agreement of the AO and the PCW Project Manager, the ECCMP Team may be expanded to include any other federal, state or local agency representative that has regulatory responsibility or has issued permits for the CCSM Project. Should additional agency representatives be added to the ECCMP Team, their roles and responsibilities under this ECCMP will be defined and agreed upon by the AO and the PCW Project Manager.

3.3 COMPLIANCE MONITORING TEAM

The Compliance Monitoring Team is responsible for carrying out the day to day environmental compliance monitoring and reporting activities on the CCSM Project Site. The Compliance Monitoring Team for the CCSM Project consists of a subset of the ECCMP Team. The members of the Compliance Monitoring Team include the following:

- Environmental Compliance Monitor (ECM)
- PCW Compliance Manager (CM)
- Environmental Inspectors

Copies of the CCSM Project environmental conditions and requirements addressed under this ECCMP will be provided to each member of the Compliance Monitoring Team. The Compliance Monitoring Team is required to be familiar with this ECCMP, the roles and responsibilities of each ECCMP Team member, applicable CCSM Project environmental conditions and requirements, and the CCSM Project chain of command during construction. The Compliance Monitoring Team representatives will participate in pre-construction and site coordination meetings, as well as the EAP. Compliance Monitoring Team members will receive additional training as determined necessary by the CM in consultation with the BLM Project Manager.

Each member of the Compliance Monitoring Team will successfully complete and remain current on relevant health and safety training required to work on the CCSM Project Site and will comply with the PCW safety rules and programs. As with all other workforce members, a Compliance Monitoring Team member may be removed from his or her position for violation of PCW safety rules in accordance with PCW's established policy.

3.4 CCSM PROJECT ACCESS

Subject to the requirements of the site health and safety plan, the Compliance Monitoring Team shall have access to all CCSM Project work areas to inspect construction activities in accordance with the terms and conditions of the ROD, ROW grant(s), and any other applicable permits. Access to work areas will not be unreasonably withheld provided that the members of the Compliance Monitoring Team have received all required safety training necessary to enter the work area.

4.0REPORTING AND DOCUMENTATION

The Compliance Monitoring Team will use a database and reporting system that is posted on a non-public, secure website (refer to Section 4.3, Non-Public CCSM Project Website) to create a readily accessible record of construction progress and environmental compliance for the CCSM Project, including photographic documentation used to evaluate compliance. The database and reporting system will be available to BLM and other approved jurisdictional agencies as agreed to by the AO and PCW Project Manager. Each weekly and monthly report, including all compliance levels and

photographic documentation from inspection logs, will be readily available on the database and reporting system.

4.1 MONITORING REPORTS AND WEEKLY UPDATES

Each Compliance Monitoring Team member will compile his/her activity logs and documentation a weekly into monitoring reports on the forms provided in Attachments A and B. A weekly CCSM Project update will be compiled by the ECM for the CCSM Project by aggregating the monitoring reports from the Compliance Monitoring Team. The weekly CCSM Project update will: (1) document the construction progress as a percent complete or other identifying method as agreed to by the AO; (2) document the presence of sensitive species or habitat and culturally sensitive sites; and (3) provide a brief description of the construction activities observed (such as road grading, erosion control, etc.). When appropriate, relevant digital photographs will be taken and included in the weekly CCSM Project update.

Each monitoring report issued by the Compliance Monitoring Team will be reviewed by the ECM and a compliance level will be assigned to the report. The compliance levels that will be used for the CCSM Project are as follows:

- Communication
- Acceptable
- Problem Area
- Noncompliance
- Serious Violation

4.1.1 COMMUNICATION

A monitoring report will be assigned a “communication” compliance level by the ECM if it is prepared to document and track relevant meetings or discussions related to CCSM Project compliance. These communications may be within the Compliance Monitoring Team, within the ECCMP Team, between the ECM and agencies, between the CM and Inspectors, or relevant communications with other on-site personnel.

4.1.2 ACCEPTABLE

A monitoring report will be assigned an “acceptable” compliance level by the ECM when the ECM determines that an inspected area or activity complies with the CCSM Project environmental requirements and applicable mitigation measures have been adequately implemented.

4.1.3 PROBLEM AREA

A monitoring report will be assigned a “problem area” compliance level by the ECM to record an observation that a location or activity does not meet the definition of acceptable but is not considered to be noncompliant. The problem area compliance level will be used to report a range of events and observations including the following:

- An incident where the CCSM Project is not out of compliance with the ROW grant that is accidental or unforeseeable and PCW’s response is appropriate and timely. An example would

be a fuel leak where CCSM Project personnel respond properly by stopping, containing, and cleaning up the spill in accordance with the CCSM Project SPCC Plan.

- A location where the CCSM Project is not out of compliance with the ROW grant but, in the judgment of the ECM, damage to resources could occur if corrective actions are not taken. Some examples are:
    - A topsoil pile located on the bank of a drainage
    - An improperly constructed/located erosion control structure
- An activity that the ECM determines is an unintentional and isolated departure from the ROW grant, with no damage to resources. An example would be a small amount of blading or mowing outside the access pathway that has no effect on sensitive resources such as sensitive plant habitat or a water body.

If a problem area is resolved in a timely manner, it will not be considered noncompliant. If a problem area is not corrected in a timely manner, is found to be a repeat situation, if multiple instances of a similar nature occur, or if it results in resource damage because timely corrective action was not completed, the ECM may document the problem area as "noncompliance" as described in the following section.

4.1.4 NONCOMPLIANCE

A monitoring report will be assigned a "noncompliance" compliance level by the ECM when an activity violates the CCSM Project ROW grants or other environmental requirements; results in damage to resources not authorized in the ROW grants; or places sensitive resources or health and safety (public or employee) at unnecessary risk. Some examples of noncompliant activities are:

- Failure to install or maintain required erosion control devices
- Surface-disturbing activities conducted without an appropriate biological, cultural, or other necessary resource monitor present.

The ECM will notify the CM about a noncompliant activity before issuing a Noncompliance Report. The Noncompliance Report will include the name of the Compliance Monitoring Team member observing the activity and the time of notification. Where practicable and where the nature of the noncompliant activity warrants, the ECM will work closely and collaboratively with the CM to determine the appropriate corrective action.

Resolution of noncompliant activities will be coordinated with the ECCMP Team to ensure that the corrective measures are properly understood and implemented. PCW will provide follow-up documentation to the BLM Project Manager and other jurisdictional agencies, as well as to the ECM regarding resolution of the noncompliance event. Following receipt of documentation regarding resolution, the ECM will inspect the area to verify and document that the noncompliance has been adequately resolved.

4.1.5 SERIOUS VIOLATION

A Compliance Monitoring Team member observing an activity they believe to be a "serious violation" will notify the ECM immediately. If the ECM determines that the activity is in fact a serious violation, a monitoring report will be assigned a "serious violation" compliance level and will be issued by the ECM immediately. Serious violations are activities that are not in compliance with the ROW grants and

may cause substantial harm to resources or pose a serious threat to sensitive resources or health and safety (public or employee). Examples of serious violations include:

- Deliberately conducting an activity that results in disturbance within an exclusion zone for a sensitive resource
- Repeated or cumulative noncompliance activities that could lead to a substantial impact on resources
- Failure to correct previously identified noncompliance activities in an established time frame

A serious violation requires that the ECM and the BLM Project Manager participate in a conference call or meeting with the PCW Project Manager or his/her authorized representative to discuss the violation, the proper corrective actions, and possible follow-up enforcement actions that could be imposed. It is PCW's responsibility to provide follow-up documentation demonstrating resolution of the serious violation to the BLM Project Manager and other jurisdictional agencies, as well as to the ECM. Once PCW documents the resolution of a serious violation, the ECM will inspect the area to verify and document that the issue has been adequately resolved. Violations of permits, stipulations or other requirements will be investigated by the AO or his/her authorized representative and subject to requirements and/or penalties under the Antiquities Act, Archaeological Resources Protection Act (ARPA), Federal Land Policy and Management Act of 1976, the rights-of-way regulations at 43 C.F.R. §2805.12 and/or other relevant laws and regulations.

4.2 MONTHLY SUMMARY REPORTS

Monthly Summary Reports will be issued that briefly describe construction activities during the reporting period and summarize by compliance level the number of reports completed by the Compliance Monitoring Team during the reporting period and cumulatively during construction of the CCSM Project. The Monthly Summary Report will also include a summary of the Level 1, 2, and 3 variance requests approved by the ECM, BLM Project Manager or AO during the reporting period and cumulatively, as well as a table summarizing the net acreage of land affected by approved variances on federal lands. For the Archeological Resources Protection Act and Endangered Species Act, a table summarizing the net acreage of land affected by approved variances on non-federal lands for the reporting period as well as cumulatively. The Compliance Monitoring Team's electronic database and reporting system will be designed to generate all the information in the tables of the Monthly Summary Report.

The Monthly Summary Reports will be posted on the non-public, secure CCSM Project website. When the Monthly Summary Report is posted, the ECM will send an email to the authorized distribution that the report is available. The email will include the link to the website. The entire ECCMP Team will be included in the distribution for the Monthly Summary Report. A sample Monthly Summary Report is provided in Attachment C.

4.3 NON-PUBLIC CCSM PROJECT WEBSITE

The Compliance Monitoring Team will establish and maintain a non-public, password-protected CCSM Project website to display the weekly and monthly monitoring reports and the approved Level 1, 2, and 3 variances (refer to section 5, Variances). The ECCMP Team will have access to the website.

5.0VARIANCES

A critical part of CCSM Project is ensuring the CCSM Project is constructed in compliance with environmental conditions and requirements contained in the ROW grants, which includes the site-specific plans of development; other federal, state, and local permits; landowner agreements; and CCSM Project construction drawings and staking plans. Infrequently, minor changes or deviations from stipulations/mitigation provided in these documents are necessary to accommodate or mitigate unexpected on-site circumstances. These deviations may be necessary to facilitate construction or provide for more effective protection of environmental resources.

When changes from CCSM Project requirements are identified, the PCW Project Manager or CM may file variance requests for approval of these changes. Additionally, the BLM may pursue similar or other types of alterations. Requests may vary in significance from minor changes (e.g., slightly shifting the location of an access road) to more complex requests (e.g., construct a new access road). These variance procedures apply only to activities taking place on BLM lands.

5.1 TIERED VARIANCE SYSTEM DURING CONSTRUCTION

A system using three variance levels (Levels 1, 2, and 3) will categorize variance requests, according to their significance and level of effort associated with the change.

Level 1. Those which do not require an amendment to the site-specific plans of development;

Level 2. Those requiring an amendment to the site-specific plans of development; and

Level 3. Those requiring an amendment to the ROW grant(s).

Level 1 and 2 variances may be used to modify or amend the site-specific plans of development. Level 3 variances will require an amendment to the ROW grant(s). In this case, a Standard Form 299 will be required.

The ECM will be authorized to address proposed/needed deviations from ROW grant stipulations and the approved site-specific plan of development associated with the ROW grant for minor variances after consulting with the BLM Project Manager to expedite construction while protecting resource values. The ECM will consult with the BLM Project Manager, or other designated BLM representative, to determine if a variance will require amendment to the site-specific plans of development or the ROW grant.

If a variance is requested by BLM, a BLM representative can initiate a variance request in consultation with the ECM, PCW Project Manager or CM, or the Contractor PM, as appropriate. The request needs to be in writing using the Variance Request Form (Attachment E). Supporting attachments, such as an alignment sheet or other CCSM Project drawings, photos, and cultural and/or biological clearances (including surveys for invasive weeds if necessary) will be required to process a variance request. The request, and PCW's input to the request, will be documented in the ECM weekly update.

5.1.1 LEVEL 1: VARIANCES ACCOMPLISHED THROUGH FIELD RESOLUTION

A Level 1 variance is a minor field adjustment within the approved ROW grant that conforms to the site-specific plans of development. These variances can be handled in the field by the ECM in consultation with the CM. Such adjustments will be documented on the Variance Request Form (Attachment E).

Examples of minor field adjustments include, but are not limited to, the following:

- Relocation of erosion control devices (note: this also may require a modification to the SWPPP);
- Locating temporary fences inside authorized work areas;
- Constructing ditch plugs and wildlife escape ramps in cable trenches, if needed;
- Permitting waterbars to be extended, if applicable, off the area designated for a cable trench or the transmission line, and into native vegetation "one dozer length" (this includes providing permission for construction equipment to work outside designated work areas);
- Allowing rubber-tired vehicles to use additional designated access roads (in addition to those approved in BLM approval documents) where improvements to the road would not be necessary (note: not intended for authorizing additional haul roads for equipment and materials); and
- Temporarily (for not more than 7 days) placing turbine parts or other assemblies outside areas designated in the site-specific plan of development but within the authorized CCSM Project area. This does not include any surface disturbance associated with temporary storage.

<u>Level 1 Variance Approval or Denial</u>

The ECM can approve or deny Level 1 variance requests in the field after consulting with the BLM Project Manager. Level 1 variance requests may be approved if the results of implementing the changes are not significant. If a Level 1 variance request is approved in the field by the ECM, PCW and the ECM will sign and approve the request using the space provided on the Variance Request Form. A Level 1 variance request can be implemented in the field as soon as it is approved and signed by the ECM. The ECM will document the approved variance and submit it to the BLM Project Manager daily.

The ECM will inform PCW within 24 hours of submittal of the Variance Request Form if the Level 1 variance is denied. PCW may choose to resubmit the request as a Level 2 variance, or to discontinue pursuit of the request. PCW may also appeal the denial to the AO who, after consideration of all facts and circumstances, may approve the Level 1 variance or uphold the denial.

<u>Level 1 Variance Distribution</u>

The ECM will send the approved Level 1 variance request to the CM, who will then distribute the variance to PCW's representatives and construction contractors as appropriate. The ECM will provide the BLM Project Manager copies of approved or denied Level 1 variances daily. The ECM will identify all Level 1 variances approved or denied during the previous week in the weekly update report.

5.1.2 LEVEL 2: VARIANCES BEYOND FIELD RESOLUTION, NOT REQUIRING AN AMENDMENT TO THE ROW GRANT(S)

This type of variance involves a deviation that exceeds the field decision authority of the ECM. Level 2 variances require approval by the BLM Project Manager with concurrence of the appropriate BLM RFO specialists. These alterations generally involve CCSM Project changes that would affect an area outside of the previously approved work area, but within the corridor previously surveyed for cultural resources, wetlands, and sensitive species. Such variance requests typically require review of supplemental documents, correspondence, and records to be provided with the request.

Examples include, but are not limited to the following:

- Shifting extra workspace outside the approved construction corridor a short distance, but within the previously surveyed corridor where overall disturbance type and acreage remains approximately the same, and no cultural, paleontological, biological resources, or invasive weed infestations could be affected;
- Shifting temporary workspace to previously disturbed areas;
- Permitting CCSM Project work to be completed in raptor areas during the construction closure window;
- Moving proposed culvert location(s) to better accommodate natural drainages (note: this also may require a modification to the SWPPP);
- Providing extra work space for topsoil and spoil material storage to prevent mixing of soils;
- Moving a range fence a specified number of feet laterally and permanently installing it to avoid proposed construction (note: this also may require an amendment to the Allotment Management Plan, if applicable.);
- Modifying seed mixes specified in the site-specific plans of development due to unavailability; note: this also may require a modification to the Reclamation Plan; and
- Modification of an access road due to safety hazards.

Variance requests also may be submitted for minor changes that would extend beyond the previously surveyed work area and corridor for sensitive resources. In these situations, additional cultural, biological, and invasive weed surveys will be required. Documentation of the surveys and other applicable correspondence will need to be submitted with the variance request. If sensitive biological resources are encountered during the additional surveys, documentation of consultation with applicable agencies must be provided with the variance request. All BLM approved stipulations, and the terms and conditions of the USFWS BO must be adhered to, in order for the variance to be approved.

To initiate a Level 2 variance request, PCW will determine the need for the variance. The request form, with attached supporting documents, will be prepared by the CM or Inspectors and discussed with the ECM. The ECM will submit the request form and attachments to the BLM Project Manager. The BLM Project Manager, after consulting with the appropriate BLM RFO specialists, will provide the CM written approval or denial (including an explanation) of the request using the space provided on the Variance Request Form. The BLM Project Manager may request additional information, or a modification of the request, before the variance can be approved. In addition, the CM will be informed if an amendment to the ROW grant will be required.

<u>Level 2 Variance Approval or Denial</u>

The BLM Project Manager will review the variance request form and any attachments in consultation with the appropriate BLM RFO specialists. If additional information or a modification to the request is required, PCW will submit the requested information within 5 business days. The BLM Project Manager will provide the CM written approval of the request using the space provided on the Variance Request Form within 5 business days from receipt of a complete request.

If a Level 2 variance is denied, the BLM Project Manager will provide the CM a written denial of the request (including an explanation) by using the space provided on the Variance Request Form within 5 business days from receipt of a complete request. PCW may choose to resubmit the request as a Level 3 variance, or to discontinue pursuit of the request. PCW may also appeal the denial to the AO who, after consideration of all facts and circumstances, may approve the Level 2 variance or uphold the denial.

Level 2 Variance Distribution

Distribution of Level 2 variance requests are the same as stated above for Level 1 variance requests.

5.1.3 LEVEL 3: VARIANCES REQUIRING AN AMENDMENT TO THE ROW GRANT

This type of variance requires an amendment to the ROW grant, completion of an application on a Standard Form 299 (SF 299), and a decision by the AO using the Variance Request Form (Attachment E).

The PCW Project Manager will prepare the SF 299 with supporting documentation, including a site-specific plan of development and map (1:24,000 scale), for submittal to the BLM RFO. The BLM will process the amendment application pursuant to 43 CFR 2800. The BLM may request additional information, or a modification of the request, before the amendment can be approved. Approval of the amendment also requires issuance of a Notice to Proceed (NTP) addressing the amendment, if a NTP is a requirement of the original ROW grant.

The BLM Project Manager will assist the ECM and PCW Project Manager in determining whether a significant proposed change, outside the approved ROW grant, will necessitate submittal of an amendment, or whether the change can be handled with a Variance Request Form.

Examples of a variance requiring an amendment to the ROW grant are as follows:

- Relocation of CCSM Project components onto BLM land; or
- Expansion of the CCSM Project Area from the one defined in the ROW grant and site-specific plans of development.

Level 3 Variance Approval or Denial

The AO will review the SF 299, Variance Request Form, and any attachments in consultation with the appropriate BLM RFO specialists. If additional information or a modification to the request is required, once notified PCW will submit the requested information or a modified request within 5 business days. If a Level 3 variance is approved, the AO will provide the PCW Project Manager written approval of the request using the space provided on the Variance Request Form (Attachment E) within 5 business days

from receipt of a complete request. The decision will be documented in the new or amended ROW grant.

If a Level 3 variance is denied, the AO will provide the PCW Project Manager a written denial of the request (including an explanation) using the space provided on the Variance Request Form (Attachment E) within 5 business days from receipt of a complete request. PCW may choose to discontinue pursuit of the request or proceed with additional NEPA documentation. PCW may also appeal the AO decision pursuant to applicable BLM regulations.

Level 3 Variance Distribution

Distribution of Level 3 variance requests are the same as stated above for Level 1 and Level 2 variance requests.

6.0STOP WORK AUTHORITY

The AO has the authority to stop work related to construction of the CCSM Project if an activity is determined to be a deviation from the CCSM Project environmental requirements or construction plans as authorized by BLM in the ROW grant. This authority may be delegated to the BLM Project Manager or ECM as determined appropriate by the AO. The PCW Project Manager, Contractor PM, CM and the Inspectors also have the authority to halt specific operations to protect cultural and biological resources.

If any member of the ECCMP Team exercises their authority to stop work, they will notify the AO, BLM Project Manager, PCW Project Manager and CM immediately to describe the circumstances of the work stoppage and the recommended resolution. Documentation of the work stoppage including the reason for the work stoppage and the recommended resolution will be submitted to the ECCMP Team by the ECM within 24 hours. PCW and BLM will work diligently to resolve any work stoppage expediently. Upon resolution of the issue by PCW and approval of the AO or his/her designated representative, work will recommence.

7.0TRAINING AND PRECONSTRUCTION MEETING

7.1 PRE-CONSTRUCTION MEETING

Prior to construction, the ECM will ensure that BLM and PCW representatives participate in a preconstruction meeting; at a minimum the Compliance Monitoring Team will be present. At that meeting, the BLM Project Manager will discuss the environmental requirements of the ROD and the ROW grant as well as those of the site-specific plan of development.

7.2 EAP

The ECM will ensure that PCW prepares and conducts an EAP for all construction personnel prior to the start of construction. The ECM will participate in the EAP to present an overview of the ECCMP and to become familiar with construction personnel. The ECM will explain the various components of the ECCMP, emphasizing the objectives of the ECCMP. The discussion will focus on the activities of the Compliance Monitoring Team and their authority and interactions with construction personnel. EAP training will describe the processes for monitoring and documentation of compliance issues and

construction progress, as well as a clear and concise explanation of the variance request process and the authority of the ECM and BLM Project Manager.

7.3 COMPLIANCE MONITORING TEAM TRAINING

In addition to participation in PCW's EAP and the preconstruction meeting, the ECM will train the Compliance Monitoring Team in all CCSM Project-specific procedures, duties, responsibilities, reporting requirements, and authorities as needed to complete their assigned tasks during monitoring of the CCSM Project construction activities.

8.0EQUIPMENT

The Compliance Monitoring Team will require field support equipment such as notebook or tablet computers and associated software, digital cameras, cellular phones, GPS devices and vehicles. Specifically, the ECM, CM and each Inspector will be equipped with a digital camera and a cellular phone, radio or other communication device.

9.0CCSM PROJECT OPERATIONS AND MAINTENANCE

Prior to commencement of commercial operation of the CCSM Project, an Environmental Compliance Monitoring Plan (ECMP) will be issued to identify the roles and responsibilities of the operations personnel, along with procedures to ensure compliance with the environmental requirements of the operational permits, approvals, plans and applicable rules and regulations.

The ECMP will include, at a minimum, provisions for the following:

- A compliance manager representing PCW, in the role of ensuring compliance with the ECMP;
- Adaptive management procedures to address changes in conditions, regulations, etc.;
- Means of accurately tracking compliance (e.g., compliance tracking database);
- Coordination with BLM and other jurisdictional agencies to report noncompliance;
- Training for personnel commensurate with their roles and responsibilities;
- Inspection and monitoring requirements; and
- Reporting and recordkeeping procedures.

Attachment A
Report Cover Page

CHOKECHERRY AND SIERRA MADRE WIND ENERGY PROJECT

COMPLIANCE MONITORING PROGRAM

MONITORING REPORT
OR
WEEKLY UPDATE

MONITORING REPORT:
The following report is for activities conducted on **DATE (Month Day, Year)** by **MONITOR**. Should you have any questions regarding the information contained in this report, please contact **MONITOR** at **PHONE** (office) or **PHONE** (mobile).

WEEKLY UPDATE:
The following report is a compilation of the monitoring reports issued by the Compliance Monitoring Team for activities conducted on **DATE (Month Day, Year)**. Should you have any questions regarding the information contained in this report, please contact **ECM** at **PHONE** (office) or **PHONE** (mobile).

Compliance Level:
Communication
Acceptable
Problem Area
Noncompliance
Serious Violation

Variance Level:
Approved Level 1
Approved Level 2
Approved Level 3

[SIGNATURE]

Total Pages:
or
Total Reports:

Attachment B
Report Form

CHOKECHERRY AND SIERRA MADRE WIND ENERGY PROJECT

COMPLIANCE MONITORING PROGRAM

MONITORING REPORT

Report Number: _____ Date:_____

Environmental Compliance Monitor: _____

Compliance Level: _____

Environmental Inspector: _____

Location: _____

SITE INSPECTION CHECKLIST

Air Quality	**Yes**	**No**
Is dust control being implemented (i.e., access roads watered, haul trucks covered, streets cleaned on a regular basis)?		
Do vehicles or equipment appear to be idling unnecessarily?		
Biology	**Yes**	**No**
Are appropriate measures in place to protect sensitive habitat (i.e., flagging, signage, exclusion fencing, biological monitor)?		
Are all activities being conducted within the approved limits of disturbance?		
Have impacts occurred to adjacent habitat (sensitive or non-sensitive)?		
Cultural and Paleontological	**Yes**	**No**
Are known cultural resources clearly marked for exclusion?		
Is a cultural monitor on site if required by the approved treatment plan?		
Is a paleontological monitor on site if grading is occurring in the immediate area of a fossil discovery?		
Hazardous Materials	**Yes**	**No**
Have all spills been cleaned-up in accordance with the SPCC Plan?		
Are fuels, oils, lubricants, and other hazardous materials on-site labeled and stored in appropriate containers?		
Water Quality	**Yes**	**No**
Have temporary erosion and sediment control measures been installed?		
Are BMPs in good condition and functional?		
Is mud tracked onto roadways cleaned-up in accordance with the project's SWPPP?		

DESCRIPTION OF OBSERVED ACTIVITY

ISSUES REQUIRING CORRECTIVE ACTION

Description of Issue Requiring Corrective Action	PCW Notification		Description of Corrective Action Implemented by PCW
	Name	Date	

Photos:

Photo 1:	Photo 2:
Photo 3:	Photo 4:

Completed by:

Name:
Firm:
Date:

Distribution:

Attachment C
BLM Authorized Officer Report

BLM Authorized Officer
Weekly Report

Address: Phone: Website:
City, State Zip: Fax:

Project: Chokecherry and Sierra Madre Wind Energy Project

Prepared By:

Reporting Period:

Summary:

Site Inspections/Mitigation Monitoring:

- Compliance Issues with Applicable Conditions of Certification (e.g., areas out of compliance, interpretational disagreements, etc.)
- Issues of Concern with or by the Applicant

Construction Activities:

Compliance:

Construction Progress:

Week	% Complete (projected)	% Complete (updated)

Note: The percentage complete is an estimate only and is not derived directly from the project schedule.

Construction Schedule:

- Scheduled Activities for Next Week
- Potential Delays to the Online Date of the Project

Plan Review Submittal Items:

Submittal Type	Description

Notice to Proceed:

NTP No.	Date Issued	Project Component	Conditions Included (Y/N)

Variance Requests:

Variance Request No.	Submitted	Description	Status	Approval Date

Project Photographs:

Attachment D
Certification of Completion of Environmental Awareness Program

Certification of Completion
Environmental Awareness Program

This is to certify these individuals have completed a mandatory Environmental Awareness Program (EAP). The EAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (construction supervisors and crews) working on the CCSM Project Site. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials.

No.	Employee Name	Title/Company	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

Cultural Trainer: _____ Signature:_____ Date:_____
Paleo Trainer: _____ Signature:_____ Date:_____
Biological Trainer: _____ Signature:_____ Date:_____

Include this completed form in the Monthly Compliance Report.

Attachment E
Variance Request Form

Variance Request Form

Power Company of Wyoming LLC.

Chokecherry and Sierra Madre Wind Energy Project

Variance Request No.:

Date Submitted:

Date Approval Required:

BLM Approval Reference No.:

Location:

Alignment Sheet/

Construction Drawing/Station Number: _____ Approval Agency:

Current Land Use/Vegetative Cover:

Nearby Features (Washes, Wetland, Noxious Weed Area, Residence (distance):

Variance Level	[ ] Level 1	[ ] Level 2	[ ] Level 3
Variance requested in →	[ ] Permit	[ ] Plan/Procedure	[ ] Specification
	[ ] Mitigation Measure	[ ] Drawing	[ ] Other

Detailed Description of Variance: Attachments? [ ] Yes [ ] No Photos? [ ] Yes [ ] No

Variance Justification:

Additional Surveys Required		Surveyed Corridor Description	Additional Surveys Completed
Cultural Survey	[ ] Y [ ] N		[ ] Y [ ] N
T & E	[ ] Y [ ] N		[ ] Y [ ] N
Weeds	[ ] Y [ ] N		[ ] Y [ ] N

Request prepared by:

Sign-off (as appropriate)	Name (Print)	Approval Signature	Date	Conditions Attached
Environmental Manager				[ ] Y [ ] N
Chief Inspector				[ ] Y [ ] N
BLM 1/				[ ] Y [ ] N

For use in approval only.

Variance Approval:_____ Variance Denied: _____ Beyond Authority:

Approval Number: _____ Date:

Signature: _____ Stipulations:

If the ECM is authorized (in the POD or other document included in the BLM ROW authorization documents) to act/sign on behalf of BLM, include the name of ECM with the signature.

Chokecherry and Sierra Madre Wind Energy Project Relating to Wind Turbine Generator Number (if applicable): Variance Conditions (refer below for individual requesting the condition and specific condition(s). Name:	Title:	Organization:
Conditions:		
Name:	Title:	Organization:
Conditions:		
Name:	Title:	Organization:
Conditions:		

APPENDIX G

Chokecherry and Sierra Madre Wind Energy Project

Dust Control Plan

Prepared for

555 Seventeenth Street
Suite 2400
Denver, CO 80202

Prepared by

Westwood Professional Services
7699 Anagram Drive
Eden Prairie, MN 55344
(952) 937-5150
www.westwoodps.com

September 2013
(Updated March 2014)

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal lands within the CCSM Project Site. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Site are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities).

This Dust Control Plan (Plan) provides an overview of methods that PCW will use to avoid and minimize dust emissions from construction, operations, maintenance, and decommissioning of the CCSM Project. PCW will implement this Plan in accordance with the requirements of the

EIS and ROD for the CCSM Project, as well as all applicable rules and regulations. Upon concurrence from the BLM Authorized Officer, PCW will update and modify this Plan as needed to address the changing conditions and requirements of the CCSM Project.

2.0EXISTING CONDITIONS

The existing conditions on the CCSM Project Site that may affect the potential for dust include geology, soils, and vegetation. These conditions are described below.

2.1 GEOLOGY

According to Chapman et al. (2004), surface geology in the area of the CCSM Project consists of Quaternary alluvium, colluvium, outwash deposits, and eolian deposits derived from Tertiary and Cretaceous claystone, sandstone, and sedimentary rock (majority of CCSM Project Site); and Quaternary alluvium and colluvium, gravel and fan deposits, and areas of active and stabilized dune sand and loess underlain with Tertiary and Cretaceous siltstone, sandstone, claystone, and areas of shale marlstone (northeast portion of the Chokecherry Wind Development Area). Geologic units underlying the CCSM Project Site include Quaternary alluvium, intermixed Steele Shale and Niobrara formations, Mesa Verde Group, Steele Shale and small amounts of Frontier, Mowry and Thermopolis Shales.

2.2 SOILS

Soils within the CCSM Project Site are primarily derived from sedimentary formations and are predominantly Orthents; soils that are shallow to very deep and medium to fine textured and have a frigid temperature regime, an aridic moisture regime, and mixed or bentonitic mineralogy. The CCSM Project Site is located in an arid environment that contains potentially erosive soils. Surface disturbing activities may result in exposed soils, accelerated soil erosion, and reduced soil productivity.

Soils in the northern third of the CCSM Project Area are derived from shale, sandstone, and weathered remnants (i.e. residual soils) of the Mesaverde Group and Steele Shale. The most commonly encountered soils include the Rentsac, Blazon, and Diamondville series (BLM 2012a). Based on geotechnical testing, soils are very shallow to deep and are generally described as medium dense to very dense or soft to hard with occasional sub-rounded to sub-angular gravel, slight ferrous staining, intermittent sandstone seams and layers, and few sandstone fragments.

Soils within the Sage Creek Basin portion of the CCSM Project Site are composed of alluvium underlain by Upper Cretaceous Aged Steele Shale (Fugro 2013). The most commonly encountered soils include the Wellsville, Echemoor, and Lupinto series (BLM 2012). Based on geotechnical testing, soils are moderately deep to deep and are generally described as soft to hard with occasional sub-rounded to sub-angular gravel and slight ferrous staining.

Soils within lower Miller Hill are generally composed of alluvium while the slopes of Miller Hill are generally composed of highly to slightly weathered sandstone of the Niobrara Formation, shale of the Frontier, Mowry, and Thermopolis Shale, and interbedded sandstone and shale of the Browns Park Formation (Fugro 2013). The most commonly encountered soils include the Wellsville, Echemoor, and Lupinto series (BLM 2012).

2.3 VEGETATION

Vegetation in the CCSM Project Site is characterized by areas of rolling sagebrush steppe, salt desert shrub basins, and foothills shrubland. Aspen-mixed conifer woodland, upland grasslands and sparsely vegetated communities are also present. Plant surveys were conducted in the CCSM Project Site in 2009 and confirmed during 2012 and 2013 survey efforts.

Sagebrush steppe is the most common vegetation type in CCSM Project Site and is the predominant vegetation type in the Nevins Ridge and Upper Miller Hill turbine development areas. Sagebrush steppe is also common in the Lower Miller Hill turbine development area. Scattered sagebrush communities are also present in the flats north of Chokecherry and in the Sage Creek basin where the community is intermixed with salt desert shrub communities and along drainages. Sagebrush habitats in the CCSM Project Site consists of a mosaic of sagebrush, allied shrubs and forbs, and grasses and is dominated or codominated by one or more Artemisia species, such as Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). In higher elevations, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is present. Sagebrush communities occur across approximately 60% of the CCSM Project site

Salt-desert shrub communities are the second most common vegetation and occur across approximately 20% of the CCSM Project Site. Salt desert shrub communities are characterized by salt tolerant plants with a dominant shrub component of one or more *Atriplex* species such as Gardner's saltbush (*Atriplex gardneri*) or shadscale (*Atriplex confertifolia*) and are often codominant with birdsfoot sagebrush (*Artemisia pedatifida*), black greasewood (*Sarcobatus vermiculatus*), or other allied shrub and herbaceous species. These communities primarily occur in the northern flats north of the Chokecherry Wind Development Area, in the Sage Creek Basin, and in saline soils in the Lower Miller Hill area. Salt Desert Shrub Communities also occur along the North Platte River water extraction road in the eastern portions of the Chokecherry Wind Development Area.

Sparsely vegetated and barren communities are scattered throughout the CCSM Project area Sparsely vegetated and barren communities occur across 4-5% of the CCSM Project Site. These communities primarily occur in association with salt-desert shrub communities although sparsely vegetated areas also occur in association with sagebrush communities especially in windswept areas or areas with shallow soils. Vegetation is generally characterized by a patchy distribution of upland sedges and cushion plants and mat-forming forbs composed of stemless mock goldenweed and one or more phlox species such as spiny phlox or prickly phlox. Various buckwheat species (*Eriogonum* spp.) and pricklypear (*Opuntia* spp.) often codominate these barren landscapes, but cover is minimal.

Aspen woodlands and mixed-conifer forests occur at elevations greater than 7,500 feet in the southwestern portions of the CCSM Project Site below the rim of Miller Hill. These communities occupy less than 2% of the CCSM Project Site. The predominant overstory vegetation is an open-canopy of quaking aspen, with a dense understory of forbs, grasses, and scattered montane shrubs.

Montane shrublands cover approximately 1% of the CCSM Project Site, predominantly located in the southern and southwestern portions at elevations ranging between 7,200 to 8,100 feet. These systems are typically associated with dry, exposed sites and are often in the uplands adjacent to aspen communities. Inclusions of sagebrush steppe or grassland often occur, but the vegetation is typically dominated by a variety of shrubs including serviceberry, mountain mahogany, common juniper, currant, snowberry, creeping barberry, antelope bitterbrush.

Upland grasslands occur throughout the CCSM Project Site although the Chokecherry Wind Development Area has a greater occurrence of contiguous grassland cover. These communities typically occur between 6,500 to 8,400 feet in elevation and occur across approximately 7% of the CCSM Project Site. The vegetation is characterized as mixed-grass prairie on gentle to moderate slopes (0–20%), growing on drainage terraces, draws, alluvial flats and plains, escarpments, gulches, hillslopes, knobs, knolls, bluffs, and plateaus. Upland grasslands form a matrix with the surrounding sagebrush steppe, creating a mosaic landscape of rolling grasslands interspersed throughout sagebrush communities.

Remaining vegetation communities include lowland mesic grasslands and riparian communities, agricultural pastures and hay meadows, disturbed/developed areas.

3.0 AREAS OF ENHANCED SENSITIVITY

The vast majority of the CCSM Project Site is uninhabited agricultural land well removed from any cities, towns and major public roads. The closest public receptors to the CCSM Project Site that may have enhanced sensitivity to dust include:

- City of Rawlins
- Towns of Sinclair and Saratoga
- Interstate 80
- Residences along the periphery of the CCSM Project Site
- Teton Reservoir Recreation Site
- Wyoming State Penitentiary

While these areas may be more sensitive to dust from the CCSM Project, most are located miles away from the CCSM Project Site and work activities. According to the EIS, dust emissions from the CCSM Project are expected to be widely dispersed and short lived (BLM 2012). With proper dust control, as described in this Plan, significant effects to areas of enhanced sensitivity are not anticipated from the CCSM Project.

4.0 DUST SOURCES

Table 1 summarizes typical CCSM Project activities that have the potential to generate dust.

Table 1. Potential Dust Sources

Dust Source	Phase I Haul Road and Facilities	West Sinclair Rail Facility	Road Rock Quarry	Phase I Wind Development	Phase II Wind Development
Grading	●	●	●	●	●
Excavation	●	●	●	●	●
Rock crushing			●		
Blasting	●		●	●	●
Material stockpiling	●	●	●	●	●
Aggregate placement	●	●	●	●	●
Concrete batching			●	●	●
Vehicle activity	●	●	●	●	●
Roadway maintenance	●	●	●	●	●

5.0 REASONABLY AVAILABLE CONTROL MEASURES

PCW will control dust during the construction, operations, maintenance and decommissioning of the CCSM Project. To accomplish this, PCW will implement reasonably available dust control measures throughout the CCSM Project Site, as appropriate, to protect soils. The following sections describe the reasonably available dust control measures that will be used on the CCSM Project as needed. Dust control measures that are already incorporated into ROD, such as surfacing roads and controlling site access, are not discussed again below, see Appendix D of the ROD for a description of these measures.

5.1 DESIGN SOLUTIONS

Dust control design solutions were used in the CCSM Project design where practicable and effective, as described in the site-specific plans of development for the CCSM Project. Table 2 includes a list of dust control design solutions.

Table 2. Dust Control Design Solutions

Dust Control Method	Comments	Common Frequency of Use	Relative Cost
Phasing/Pre-grading Planning	Plan soil grading and disturbances to minimize exposure before surfacing is applied or stabilization begun.	One time	Low
Gravel Surface	Where appropriate, design roads and laydown yards to have gravel surfaces.	One time	Moderate
Grading Design	Balance cut/fill earthwork to avoid unnecessary stockpiling of materials to the extent possible.	One time	Low
Stockpile Locations	Locate stockpiles down-wind of construction activities, buildings, and other dust sensitive sites where possible.	One time	Low
Vegetation	Establish temporary vegetation as quickly as possible in accordance with CCSM Project's Master Reclamation Plan.	Ongoing	Low

5.2 TEMPORARY CONTROLS

The CCSM Project Erosion Control Plan and Storm Water Pollution Prevention (SWPP) Plan describe certain best management practices to control water erosion; these practices will also minimize and prevent dust caused by wind erosion. The temporary erosion control practices that will be used on the CCSM Project include:

- Scheduling activities to reduce soil exposure
- Surface roughing
- Riprap slope stabilization
- Erosion control blankets and geotextiles
- Organic mulch
- Rock mulch
- Soil binders and tackifiers
- Vegetation establishment

Additional information on the above erosion control practices and how they will be implemented can be found in the SWPP Plan appended to each site-specific plan of development for the CCSM Project.

5.3 CONTROL USING ADDITIVES

The primary method of dust control on the CCSM Project will be the application of additives. The application of additives includes water application and/or chemical stabilization of soil surfaces during dust-generating activities. PCW anticipates that dust control for the CCSM Project will be accomplished primarily by the application of water using water trucks with

controlled applicators. Upon concurrence from the BLM Authorized Officer, PCW will apply commercial dust suppressants as needed. PCW is proposing the use of the commercial dust suppressants listed in Table 3; however, PCW may identify alternate compounds in the future. When commercial dust suppressants are used, they will be applied in accordance with the manufacturer's specifications. No significant impacts are expected from the use of commercial dust suppressants when they are used in accordance with the recommendations in Table 3 (Addo, 1993). As the CCSM Project progresses, PCW will evaluate the effectiveness of additives at the CCSM Project Site and adjust their use to optimize dust control.

Table 3. Additive Dust Suppressants and Considerations

Dust Suppressant	Comments	Common Frequency of Use	Relative Cost
Fresh Water	Frequent application, significant water usage, can lead to erosion	Daily	Low
Calcium Chloride and Magnesium Chloride[1]	Most effective on roads with low to moderate traffic use; commonly used on rural roads. Should not be applied more frequently than weekly.	Weekly	Medium
Lignin Derivatives[1]	Similar results to chlorides, but more expensive. Care should be taken to prevent spills into water sources.	Weekly	High
Tree Resin Emulsions	Very expensive and less effective than other options. Can increase surface run-off.	Weekly	High

Source: Addo and Sanders 1993
Notes: [1]In accordance with current BLM policy, PCW will not apply these compounds within 500 feet of a perennial stream on federal lands.

5.4 MECHANICAL CONTROLS

Mechanical dust control methods are anticipated to have limited application on the CCSM Project Site; however, mechanical methods will be considered where dust sources can be covered or sheltered from the wind efficiently and effectively. Table 4 includes a list of mechanical dust control methods that will be used on the CCSM Project as necessary and practicable.

Table 4. Mechanical Dust Suppressants and Considerations

Dust Control Method	Comments	Common Frequency of Use	Relative Cost
Covers	Tarps can be used on trucks and small stockpiles as temporary covers. Covers must be anchored to prevent removal by wind.	As needed	Low
Wind Shelters	Wind barriers made of soil berms, fabric or wooden structures to shield sensitive areas from repeated heavy winds.	Very Isolated Circumstances	Medium

5.5 OPERATIONAL CONTROLS

Operational dust control methods involve changes to activities and practices to minimize the potential for dust generation. Operational dust control methods may be appropriate for specific activities, such as land clearing, earthmoving, stockpiling, and transportation. Table 5 includes a list of operational dust control methods that PCW will apply as needed and as practicable.

Table 5. Operational Dust Control Methods

Dust Control Method	Comments	Common Frequency of Use	Relative Cost
Haul Vehicle Restrictions	Speed restrictions due to high winds and other site conditions.	High Wind Days	Low
Gravel and Soil Placement Equipment	Restrict height and speed at which materials are placed.	Daily	Low
Altering Loading and Unloading Procedures	Confine loading and unloading procedures to the downwind side of storage piles.	High Wind Days	Low

6.0 IMPLEMENTATION

PCW has applied the applicable dust control measures described in Section 4 to the design and planning of the CCSM Project. As the CCSM Project progresses, PCW will optimize the dust control measures as needed to improve effectiveness and efficiency. The primary methods of dust control PCW will use on the CCSM Project include:

- Locating facilities with the potential to emit dust in lower-wind areas;
- Surfacing CCSM Project roads with aggregate;
- Posting speed limits; and
- Applying water or other additive when needed.

The anticipated dust control methods for activities with the highest potential to emit dust are described in Table 6.

Table 6. Dust Control Method Implementation

Activity	Dust Control Method
Site preparation	Site preparation activities include the removal and stockpiling of topsoil and subsoil, as well as some ground compaction. PCW will use water application as the primary dust control method during site preparation. Water will be applied frequently during soil stripping, and will be applied to soil stockpiles as needed.
Road, laydown yard, and rail construction	Construction of roads, rail, and laydown yards includes installation of drainage features and aggregate surfacing, as well as additional ground compaction where required. These activities are not expected to be significant sources of dust during typical site conditions; however, PCW will monitor road, rail, and laydown yard construction and will apply water as needed.
Road use	During construction, operation, maintenance and decommissioning of the CCSM Project, traffic on CCSM Project roads will likely generate dust. PCW will surface CCSM Project roads with gravel and will post and enforce speed limits. If additional dust control is necessary, PCW will apply water or another additive to the road surface. For roads with the highest levels of traffic, such as the Haul Road, PCW will likely apply magnesium chloride proactively each spring.[1]
Road maintenance	During operations and maintenance of the CCSM Project, PCW will perform road maintenance as needed to maintain safe driving surfaces and effective access throughout the CCSM Project Site. Road maintenance typically involves aggregate placement, shoulder repair, and culvert cleaning. If dust is generated during road maintenance, PCW will apply water or other additives as needed.[1]
Material handling and storage	PCW will store construction material, such as aggregate, soil, and sand, in stockpiles located within the CCSM Project laydown yards. Material stockpiles may generate dust. To control dust from material stockpiles, PCW will attempt to locate material stockpiles in lower wind areas of the laydown yards and will orient the stockpiles parallel to the primary wind direction, where practicable. To further control dust from material stockpiles, PCW will apply water as needed. When site conditions warrant, PCW may install covers over material stockpiles that create significant dust on a routine basis.
Quarry excavation and crushing	Excavation and crushing operations at the Road Rock Quarry will likely create dust. To avoid and minimize dust at the Quarry, PCW has located the Quarry in a location that is sheltered from wind blowing in the primary direction (from the southwest). In addition, water trucks will apply water during excavation as needed to control dust. When blasting is required and is expected to generate dust, PCW will apply water to the blast area prior to blasting. If dust is observed at the rock crusher, PCW will apply water to the material prior to crushing. If dust continues to occur at the crusher, PCW will evaluate the feasibility of a tank-and-spray nozzle system between the primary and secondary crushers.

[1] In accordance with current BLM policy, PCW will not apply chloride compounds or lignin derivatives within 500 feet of a perennial stream on federal lands.

Activity	Dust Control Method
Concrete batching	Concrete batching involves the handling of aggregate, cement, and other materials which can generate dust, similar to other material handling operations. PCW will control dust from concrete batching operations as described for material handling and storage.
Excavation and trenching	PCW will store material generated by excavation and trenching in low-profile stockpiles to the extent practicable to limit dust generation. PCW will apply water as needed to soil stockpiles to control dust.

7.0 REFERENCES

Addo, Jonathan and Sanders, Thomas, Ph.D. "Effectiveness and Environmental Impact of Road Dust Suppressants." Colorado State University. December 1993.

Bureau of Land Management (BLM). 2012. Chokecherry and Sierra Madre Wind Energy Project Final Environmental Impact Statement (Volume II). Rawlins Field Office, Carbon County, Wyoming. June 2012.

APPENDIX H

Chokecherry and Sierra Madre Wind Energy Project

Erosion Control Plan

Prepared for

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1.0INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Site. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Site are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

This Erosion Control Plan (Plan) for the CCSM Project provides an overview of the erosion control goals, standards, methodologies and methods that will be used during the construction,

operation, maintenance and decommissioning of the CCSM Project. PCW will avoid and minimize erosion where possible and will use erosion control measures as needed to meet all applicable rules, regulations, and requirements for the CCSM Project. Upon concurrence from the BLM Authorized Officer, PCW will update and modify this Plan as needed to address the changing conditions and requirements of the CCSM Project.

This Plan defines methodologies for determining erosion potential and options for minimizing erosion. Common procedures, methods, and monitoring and reporting requirements for erosion control are also discussed along with the appropriate use of erosion control measures. Details on how erosion control measures will be applied to each CCSM Project component are provided in the Storm Water Pollution Prevention (SWPP) Plan for each site-specific plan of development.

The CCSM Project will have multiple Wyoming Pollutant Discharge Elimination System (WYPDES) permits and activity-specific SWPP Plans due to the complexity of the CCSM project and the scope of the WYPDES permits. Most of the CCSM Project activities will be authorized under the Wyoming Department of Environmental Quality (WYDEQ) general WYPDES permit WYR10-0000. The Road Rock Quarry will likely be covered under the WYDEQ General Permit WYR320000 for Mineral Mining Activities. Refer to the SWPP Plans included in each site-specific plan of development for additional details.

2.0EXISTING CONDITIONS

The existing conditions on the CCSM Project Site that may affect the potential for erosion include geology, soils, and vegetation. These conditions are described below.

2.1 GEOLOGY

According to Chapman et al. (2004), surface geology in the area of the CCSM Project consists of Quaternary alluvium, colluvium, outwash deposits, and eolian deposits derived from Tertiary and Cretaceous claystone, sandstone, and sedimentary rock (majority of CCSM Project Site); and Quaternary alluvium and colluvium, gravel and fan deposits, and areas of active and stabilized dune sand and loess underlain with Tertiary and Cretaceous siltstone, sandstone, claystone, and areas of shale marlstone (northeast portion of the Chokecherry Wind Development Area). Geologic units underlying the CCSM Project Site include Quaternary alluvium, intermixed Steele Shale and Niobrara formations, Mesa Verde Group, Steele Shale and small amounts of Frontier, Mowry and Thermopolis Shales.

2.2 SOILS

Soils within the CCSM Project Site are primarily derived from sedimentary formations and are predominantly Orthents; soils that are shallow to very deep and medium to fine textured and have a frigid temperature regime, an aridic moisture regime, and mixed or bentonitic mineralogy. The CCSM Project Site is located in an arid environment that contains potentially erosive soils. Surface disturbing activities may result in exposed soils, accelerated soil erosion, and reduced soil productivity.

Soils in the northern third of the CCSM Project Area are derived from shale, sandstone, and weathered remnants (i.e. residual soils) of the Mesaverde Group and Steele Shale. The most commonly encountered soils include the Rentsac, Blazon, and Diamondville series (BLM 2012a). Based on geotechnical testing, soils are very shallow to deep and are generally described as medium dense to very dense or soft to hard with occasional sub-rounded to sub-angular gravel, slight ferrous staining, intermittent sandstone seams and layers, and few sandstone fragments.

Soils within the Sage Creek Basin portion of the CCSM Project Site are composed of alluvium underlain by Upper Cretaceous Aged Steele Shale (Fugro 2013). The most commonly encountered soils include the Wellsville, Echemoor, and Lupinto series (BLM 2012). Based on geotechnical testing, soils are moderately deep to deep and are generally described as soft to hard with occasional sub-rounded to sub-angular gravel and slight ferrous staining.

Soils within lower Miller Hill are generally composed of alluvium while the slopes of Miller Hill are generally composed of highly to slightly weathered sandstone of the Niobrara Formation, shale of the Frontier, Mowry, and Thermopolis Shale, and interbedded sandstone and shale of the Browns Park Formation (Fugro 2013). The most commonly encountered soils include the Wellsville, Echemoor, and Lupinto series (BLM 2012).

2.3 VEGETATION

Vegetation in the CCSM Project Site is characterized by areas of rolling sagebrush steppe, salt desert shrub basins, and foothills shrubland. Aspen-mixed conifer woodland, upland grasslands and sparsely vegetated communities are also present. Plant surveys were conducted in the CCSM Project Site in 2009 and confirmed during 2012 and 2013 survey efforts.

Sagebrush steppe is the most common vegetation type in CCSM Project Site and is the predominant vegetation type in the Nevins Ridge and Upper Miller Hill turbine development areas. Sagebrush steppe is also common in the Lower Miller Hill turbine development area. Scattered sagebrush communities are also present in the flats north of Chokecherry and in the Sage Creek basin where the community is intermixed with salt desert shrub communities and along drainages. Sagebrush habitats in the CCSM Project Site consists of a mosaic of sagebrush, allied shrubs and forbs, and grasses and is dominated or codominated by one or more Artemisia species, such as Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). In higher elevations, mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) is present. Sagebrush communities occur across approximately 60% of the CCSM Project site

Salt-desert shrub communities are the second most common vegetation and occur across approximately 20% of the CCSM Project Site. Salt desert shrub communities are characterized by salt tolerant plants with a dominant shrub component of one or more *Atriplex* species such as Gardner's saltbush (*Atriplex gardneri*) or shadscale (*Atriplex confertifolia*) and are often codominant with birdsfoot sagebrush (*Artemisia pedatifida*), black greasewood (*Sarcobatus vermiculatus*), or other allied shrub and herbaceous species. These communities

primarily occur in the northern flats north of the Chokecherry Wind Development Area, in the Sage Creek Basin, and in saline soils in the Lower Miller Hill area. Salt Desert Shrub Communities also occur along the North Platte River water extraction road in the eastern portions of the Chokecherry Wind Development Area.

Sparsely vegetated and barren communities are scattered throughout the CCSM Project area Sparsely vegetated and barren communities occur across 4-5% of the CCSM Project Site. These communities primarily occur in association with salt-desert shrub communities although sparsely vegetated areas also occur in association with sagebrush communities especially in windswept areas or areas with shallow soils. Vegetation is generally characterized by a patchy distribution of upland sedges and cushion plants and mat-forming forbs composed of stemless mock goldenweed and one or more phlox species such as spiny phlox or prickly phlox. Various buckwheat species (*Eriogonum* spp.) and pricklypear (*Opuntia* spp.) often codominate these barren landscapes, but cover is minimal.

Aspen woodlands and mixed-conifer forests occur at elevations greater than 7,500 feet in the southwestern portions of the CCSM Project Site below the rim of Miller Hill. These communities occupy less than 2% of the CCSM Project Site. The predominant overstory vegetation is an open-canopy of quaking aspen, with a dense understory of forbs, grasses, and scattered montane shrubs.

Montane shrublands cover approximately 1% of the CCSM Project Site, predominantly located in the southern and southwestern portions at elevations ranging between 7,200 to 8,100 feet. These systems are typically associated with dry, exposed sites and are often in the uplands adjacent to aspen communities. Inclusions of sagebrush steppe or grassland often occur, but the vegetation is typically dominated by a variety of shrubs including serviceberry, mountain mahogany, common juniper, currant, snowberry, creeping barberry, antelope bitterbrush.

Upland grasslands occur throughout the CCSM Project Site although the Chokecherry Wind Development Area has a greater occurrence of contiguous grassland cover. These communities typically occur between 6,500 to 8,400 feet in elevation and occur across approximately 7% of the CCSM Project Site. The vegetation is characterized as mixed-grass prairie on gentle to moderate slopes (0–20%), growing on drainage terraces, draws, alluvial flats and plains, escarpments, gulches, hillslopes, knobs, knolls, bluffs, and plateaus. Upland grasslands form a matrix with the surrounding sagebrush steppe, creating a mosaic landscape of rolling grasslands interspersed throughout sagebrush communities.

Remaining vegetation communities include lowland mesic grasslands and riparian communities, agricultural pastures and hay meadows, disturbed/developed areas.

3.0DETERMINATION OF EROSION POTENTIAL

Surface-disturbing activities associated with the construction, operation, maintenance and decommissioning of the CCSM Project may result in exposed soils and accelerated soil erosion. PCW has surveyed the CCSM Project Site to identify areas of increased erosion potential (SWCA 2013). Generally, the surveyed areas are stable or have only slight erosion

potential. Areas having moderate, critical, or severe erosion potential are generally associated with steep slopes or unstable areas adjacent to previously developed areas and roadways. More than 1,500 erosion potential data points (Table 1) were collected at turbine locations, road intersections, drainage crossings, or areas of obvious erosion. Of these data, 90.6% were classified as being stable or having only slight erosion potential, 8.6% were classified as having moderate or critical erosion potential, and only 0.8% were classified as having severe or extremely severe erosion potential (Table 2). All areas across the CCSM Project Site generally had stable conditions (Table 1 and Table 2).

This Plan, in conjunction with the measures included in the ROD and the SWPP Plan for each site-specific plan of development, will control erosion to minimize impacts to the soil resource, surrounding watersheds, and rangeland. The SWPP Plans for each site-specific plan of development address the anticipated erosion prevention, sedimentation controls, and runoff controls and designs to mitigate the erosion risk during construction. The SWPP Plans include existing conditions of the CCSM Project Site, the activities associated with the WYPDES permit, and the requirements of federal, state, and local permits. The SWPP Plans include best management practices appropriate for each site and activity.

Table 1. Number of surveyed locations in each development area associated with each erosion potential category.

Development Area	Erosion Potential Category		
	Stable/ Slight	**Moderate/ Critical**	**Severe/ Extremely Severe**
Phase I Haul Road and Facilities	139	15	3
West Sinclair Rail Facility	20	2	0
Road Rock Quarry	12	3	0
Phase I Wind Development	1404	130	13
Phase II Wind Development[2]	TBD	TBD	TBD
Total[1]	**1446**	**137**	**13**

Notes: 1. Total is not the sum of the erosion potential across all sites as presented in the table. Because of overlap in project component locations, some erosion data points were used to characterize multiple development areas.
2. TBD = To be determined, Erosion Potential for the Phase II Wind Development will be evaluated and reported in a subsequent update to this Plan.

Table 2. Percent of surveyed locations in each development area associated with each erosion potential category.

Development Area	Erosion Potential Category		
	Stable/ Slight	Moderate/ Critical	Severe/ Extremely Severe
Phase I Haul Road and Facilities	88.5%	9.6%	1.9%
West Sinclair Rail Facility	90.9%	9.1%	0.0%
Road Rock Quarry	80.0%	20.0%	0.0%
Phase I Wind Development	90.8%	8.4%	0.8%
Total	**90.6%**	**8.6%**	**0.8%**

4.0EROSION CONTROL MEASURES

PCW will implement the erosion control measures described below, as appropriate, to control erosion on the CCSM Project Site. The SWPP Plan for each site-specific plan of development includes additional information on the application of best management practices for erosion control.

4.1 CCSM PROJECT DESIGN

PCW has designed the CCSM Project to minimize the overall disturbance, as well as to avoid disturbance in unstable areas to the extent practicable. The avoidance and minimization measures applicable to erosion control are described in Appendix D to the ROD. These measures were implemented on the CCSM Project as described in Appendix A to each site-specific plan of development. By minimizing disturbance and avoiding unstable areas, PCW will preserve existing vegetation and reduce the potential for erosion to occur. The limits of disturbance for each CCSM Project feature, such as the roads, rail, laydown yards, turbine pads, etc., are shown on the issued for permit plans included in each site-specific plan of development. Where disturbance could not be avoided, PCW has characterized the erosion potential, as summarized in section 3.0, to identify appropriate erosion control measures. The range of erosion control measures that will be used on the CCSM Project is described in section 4.2 and the implementation of these measures is detailed in the SWPP Plan for each site-specific plan of development.

4.2 EROSION CONTROL MEASURES

The CCSM Project has been designed to avoid potential erosion to the extent practicable. Where erosion risk is unavoidable, PCW has designed the CCSM Project to incorporate erosion control measures commensurate with the level of remaining risk. Table 3 lists erosion control measures that will be used on the CCSM Project, as appropriate. Specific erosion

control measures applied to the CCSM Project components are discussed in the SWPP Plan for each site-specific plan of development.

Table 3. Erosion Control Measures for the CCSM Project

Measure	Common Usage
CCSM Project Design	Minimize soil disturbance, including disturbance of unstable areas
CCSM Project Schedule	Minimize duration of soil exposure prior to stabilization.
Straw Wattles	Place down gradient from disturbed areas to capture suspended sediment.
Silt Fence	Place down gradient from disturbed areas to capture suspended sediment. Options may also include wire backed silt fence where appropriate.
Rock (Aggregate) Surfacing	Install on CCSM Project roads and where construction access intersects public roads.
Riprap	Install at culvert outlets, ditch intersections, and similar drainage points to prevent scour by decelerating water.
Dewatering	Install temporary pumps to remove accumulated water in initial (short-term) disturbance where positive drainage cannot be achieved.
Mulch Cover	Cover reseeded areas with straw or hay to minimize runoff until vegetation established; may require disc-anchoring or use of tackifier.
Erosion Control Blanket	Cover reseeded areas where additional stabilization support is needed (such as steep slopes, ditches, swales).
Rock Cover/Rock Mulch	Install for temporary stabilization of subsoil stockpiles and final stabilization of areas that were too rocky for vegetation in their native condition.
Sediment Basin	Construct to collect stormwater runoff from active portions of the Quarry extraction area to reduce turbidity prior to release.

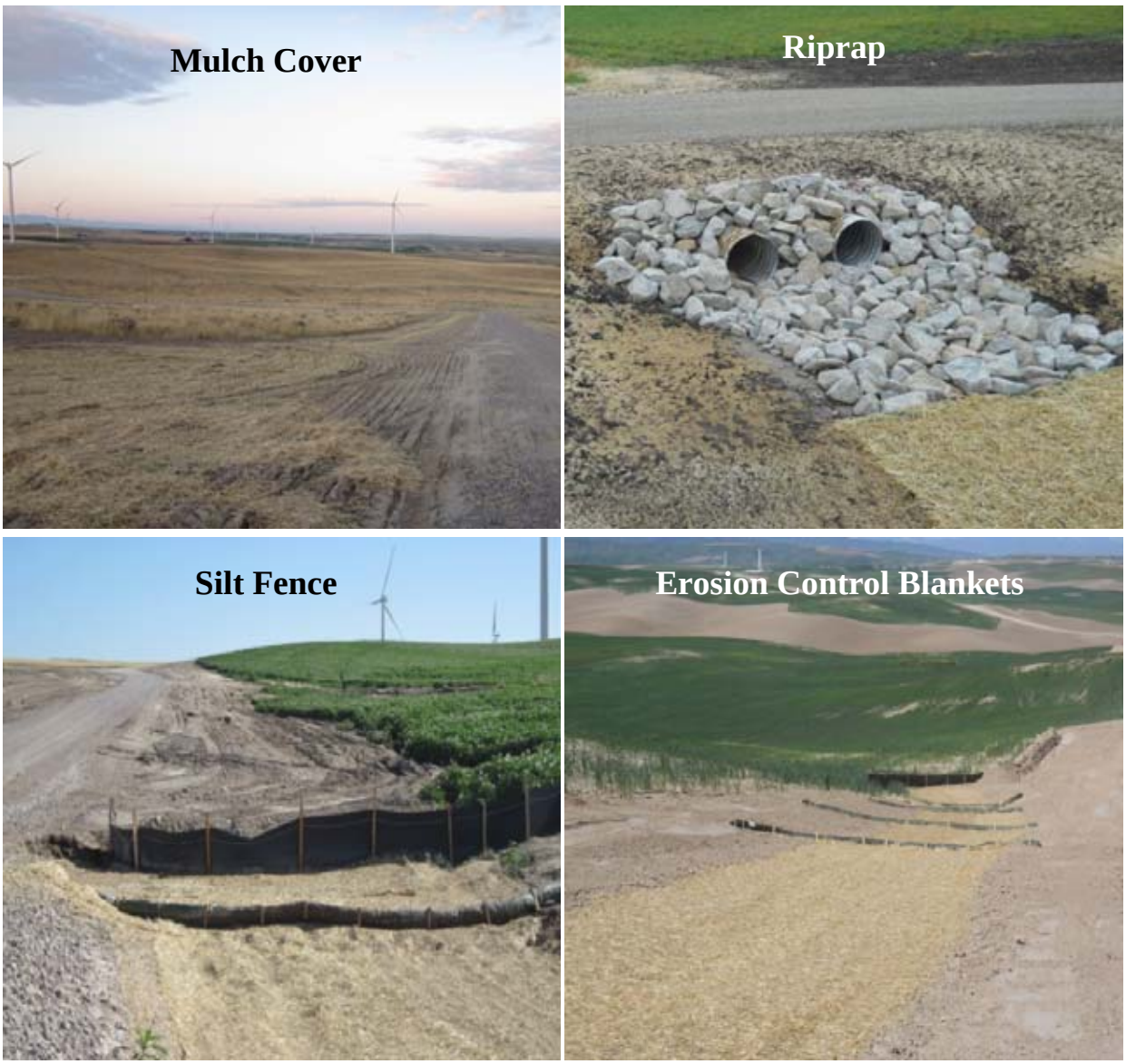

Figure 1. Typical Erosion Control Measures

5.0EROSION MONITORING AND MAINTENANCE

PCW will monitor the CCSM Project Site to insure that erosion control measures are installed as needed and functioning properly, as described in the Environmental Construction and Compliance Plan for the CCSM Project and the SWPP Plan for each site-specific plan of development.

During the CCSM Project's construction, operations, and decommissioning, PCW will continue to monitor the site to identify any new or unforeseen areas of erosion. Additional diligence will be given to locations of greater erosion risk due to steep slopes, sparse vegetation, or highly erosive soils. Should instances of new erosion be observed, PCW will

mitigate the erosion occurrence as soon as practicable utilizing the erosion control techniques contemplated herein in compliance with all applicable plans and permits. The scope of each inspection has been detailed in the Project SWPP Plans.

While erosion control measures are in place, PCW (or its delegate) will perform regular inspections of the erosion control measures. Inspections will be done as detailed in the Project SWPP Plans. Generally the inspections will be performed routinely on 14 day intervals and within 24 hours of a 0.5-inch rainfall occurring within a 24 hour period. The inspections for the quarry are planned on a quarterly basis with an inspection to be completed after larger rainfall events (1.0 inch within 24 hours) within 48 hours after the event. The inspections will be performed by qualified personnel based on their previous experience and project specific training as detailed in the Project SWPP Plans.

Most erosion and sediment control measures require routine maintenance to maintain effectiveness. As part of the inspection of erosion control measures, PCW will perform any necessary maintenance to ensure the measures are operating per their design requirements. Guidelines for when to schedule maintenance based on the condition of the BMP and the necessary timeframes or intervals for maintenance are detailed in the Project SWPP Plans.

Should some measures require extensive or frequent maintenance, PCW may elect to utilize alternative erosion control techniques to better meet the site needs. Any such alternative techniques shall be in compliance with all applicable plans and permits for the CCSM Project.

6.0DETERMINATION OF EROSION CONTROL COMPLETION

As reclamation of the CCSM Project progresses, PCW will phase out the use of erosion control measures where appropriate. Following removal of erosion control measures, monitoring of the CCSM Project Site will continue until stabilization and revegetation have been achieved as defined in the SWPP Plan and WYPDES permit. Once the revegetation requirements of the SWPP Plan are met, inspections and permit coverage for the WYPDES permit will terminate. On federal lands, monitoring of the CCSM Project Site will continue until the requirements of the CCSM Project Master Reclamation Plan and each site-specific Reclamation Plan are met.

7.0 REFERENCES

Bureau of Land Management (BLM). 2012. Chokecherry and Sierra Madre Wind Energy Project Final Environmental Impact Statement (Volume II). Rawlins Field Office, Carbon County, Wyoming. June 2012.

Chapman, S. S., S. A. Bryce, J. M. Omernik, D. G. Despain, J. SumBerge, and M. Conrad. 2004. Ecoregions of Wyoming (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,400,000).

Fugro Consultants, Inc. (FUGRO). 2013. Geotechnical Data Report 2012 Haul Road Geotechnical Investigation CCSM Wind Energy Project. Carbon County, Wyoming. Report Number 04.30121094-1. Fugro Consultants Incorporated. 2013.

APPENDIX I

Chokecherry and Sierra Madre Wind Energy Project
Storm Water Pollution Prevention Plan

West Sinclair Rail Facility

Prepared for

Power Company of Wyoming LLC

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October 2013
(Updated March 2014)

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ATTACHMENTS

A. Delegation Letter(s)
WYR10-0000 Large Construction General Permit

B. [Reserved for: Notice of Intent]
[Reserved for: Permit Authorization]
[Reserved for: Wyoming DEQ Correspondence]
[Reserved for: Sage Grouse Correspondence]

C. Terrain Map
Existing Conditions Map
Soil Map

D. Drainage Area Map
Class 1 Waters Map and 303(d) Impaired Waters Map

E. Site Inspection Report
Inspection and Rain Event Log
Corrective Action Report
Grading / Stabilization Log
Subcontractor Certification
Amendment Certification
Amendment Log

F. [Reserved for: Construction Plan Set and Erosion and Sediment Control Plans]

G. [Reserved for: BMP Details]

H. Training Documentation

I. Notice of Intent Form (rev. 8/11)
Notice of Transfer and Acceptance Form (rev. 8/06)
Notice of Termination Form (rev. 8/06)

J. [Reserved for: Sediment Pond Calculation]

K. [Reserved for: Vegetation Monitoring Protocol]

1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project). The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, the West Sinclair Rail Facility, the Road Rock Quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings. The scope of this Storm Water Pollution Prevention Plan (SWPPP) is limited to the West Sinclair Rail Facility (Facility); a separate SWPPP will be developed for the other components of the CCSM Project.

This SWPPP is prepared in accordance with the Wyoming Pollutant Discharge Elimination System (WYPDES) rules and regulations and the Wyoming Department of Environmental Quality's (WDEQ) "*General Permit to Discharge Storm Water Associated with Large Construction Activity Under the Wyoming Pollutant Discharge Elimination System (WYPDES)*", permit WYR10-0000, dated May 9, 2011 (**Attachment A**). This SWPPP is a dynamic document and will be updated by PCW as required. This SWPPP will be available on-site at all times during construction of the Rail Facility and will remain on file for three years after submittal of the Notice of Termination (NOT).

The following are outlined in this SWPPP:

- Control measures for storm water pollution prevention prior to, during, and after construction;
- Control measures for sources of potential storm water and non-storm water pollution;
- Implementation, inspection, maintenance, and documentation procedures and requirements; and
- Best Management Practices (BMP).

Note: The format and layout of this document was adapted from the Wyoming Department of Environmental Quality Template of the Storm Water Pollution Prevention Plan (for the large construction General Permit): Dated: 5-11. The numbers within parentheses following the document headings reference the sections of the WYR10-0000 Permit.

This document is based on the site-specific plan of development for the West Sinclair Rail Facility; final construction related information will be added prior to submittal of the Notice of Intent to request permit coverage.

2.0 FACILITY INFORMATION

The Facility, referred to as the West Sinclair Rail Facility, is located on a combination of federal, state and private lands south of Rawlins, Wyoming. Specifically, the Facility is located south of Interstate 80 in Sections 23, 24, 25 and 36 of Township 21 N, Range 87 W of the Sixth Principal Meridian and Sections 19, 30, 31 and 32 of Township 21 N, Range 86 W of the Sixth Principal Meridian, in Carbon County, Wyoming. The Facility and the associated construction activities are located in the quarter-quarters (or government lots) listed in Table 1. Due to the linear nature of portions of the Facility, the latitude and longitude locations listed in Table 2 refer to the major Facility features. **Attachment C** depicts the Facility location and latitude/longitude points presented below.

Table 1. Facility Location

Quarter-Quarter / Government Lot	Section	Township	Range
Lot 2	19	21N	86W
Lot 3	19	21N	86W
SW¼NE¼	19	21N	86W
NE¼SW¼	19	21N	86W
NW¼SE¼	19	21N	86W
Lot 4	30	21N	86W
NE¼SW¼	30	21N	86W
SE¼SW¼	30	21N	86W
SW¼SE¼	30	21N	86W
SE¼SE¼	30	21N	86W
Lot 1	31	21N	86W
NE¼NE¼	31	21N	86W
NW¼NE¼	31	21N	86W
SW¼NE¼	31	21N	86W
SE¼NE¼	31	21N	86W
NE¼NW¼	31	21N	86W
SE¼NW¼	31	21N	86W
NE¼NW¼	32	21N	86W
NW¼NW¼	32	21N	86W
SE¼NW¼	32	21N	86W
SW¼NW¼	32	21N	86W
NE¼NE¼	23	21N	87W

Quarter-Quarter / Government Lot	Section	Township	Range
NW¼NE¼	23	21N	87W
NE¼NW¼	23	21N	87W
SW¼NE¼	24	21N	87W
SE¼NE¼	24	21N	87W
NW¼NW¼	24	21N	87W
SW¼NW¼	24	21N	87W
SE¼NW¼	24	21N	87W
NE¼SW¼	24	21N	87W
SE¼SW¼	24	21N	87W
NE¼NW¼	25	21N	87W
SE¼NW¼	25	21N	87W
NE¼SW¼	25	21N	87W
SE¼SW¼	25	21N	87W
SW¼SE¼	25	21N	87W
SE¼SE¼	25	21N	87W
NE¼NE¼	36	21N	87W

Table 2. Facility Latitude and Longitude

Facility Feature	Latitude	Longitude
North "Y" Intersection	41° 46' 45"	-107° 10' 15"
Southeast Corner (at end of access road)	41° 45' 00"	-107° 7' 45"
Northwest Corner	41° 45' 30"	-107° 10' 15"
Northeast Corner	41° 45' 30"	-107° 8' 30"
Southwest Corner	41° 45' 00"	-107° 9' 30"

3.0 SWPPP CONTACTS (8.2.1)

SWPPP ADMINISTRATOR

Company or Organization: TBD

Name of Individual: TBD

Title: TBD

Phone: TBD Cell Phone: TBD

Fax: TBD E-mail: TBD

Table 3. SWPPP Contacts

Role	Company / Position	Name	Phone	Email
Legally Responsible Person	TBD	TBD	TBD	TBD
Owner Representative	TBD	TBD	TBD	TBD
Facility Manager	TBD	TBD	TBD	TBD
Facility (Local) Contact	TBD	TBD	TBD	TBD
Engineer of Record	Westwood Professional Services / Project Manager	Robert Copouls, PE	952-906-7470	Rob.Copouls@ westwoodps.com
SWPPP Author	Westwood Professional Services / Sr. Env. Compliance Specialist	Aaron Mlynek, CPESC	952-697-5710	Aaron.Mlynek@ westwoodps.com
Fee Contact	TBD	TBD	TBD	TBD

The Facility Manager and Facility Contact are duly authorized representatives with authority to sign the reports required under this permit (this authority does not apply to Notices of Intent [NOI], Notices or Transfer and Acceptance [NOTA], or Notices of Termination [NOT]). This authority has been delegated in writing by the Legally Responsible Person as part of the NOI or by separate letter to the WYDEQ-WQD (**Attachment A**).

Note: The SWPPP contacts, including the SWPPP Administrator, will be designated at a later date once personnel are assigned.

4.0 FACILITY AND SITE DESCRIPTION (8.2.2)

The Facility, the West Sinclair Rail Facility, is designed to allow for rail delivery of materials and components necessary for the construction, operation, maintenance, and decommissioning of the CCSM Project. The Facility connects the CCSM Project to the Union Pacific Railroad main line, reducing the volume of deliveries that must occur by truck and minimizing impacts to public roads. The Facility is a multi-modal facility, meaning it can receive and store components and material delivered by both rail and truck. The Facility consists of approximately 14 miles of track, along with 150 ac of laydown for material and component storage, and an access road.

Construction of the Facility will occur in two (2) stages: (1) site preparation and (2) track construction. Site preparation will begin with topsoil removal, followed by excavation and grading. Topsoil will be stripped, separated and wind-rowed or stockpiled. Following topsoil removal, the subsoils will be corrected as needed to support the rail track, access road, or other facilities. Subsoil correction methods may include cement stabilization, wick drain installation, or removal and recompaction of fill material, as appropriate. Grading will then be completed using bulldozers, scrapers, and motor graders. While a balance of cut and fill at the Facility is anticipated, PCW may need to borrow or remove material locally to achieve final grade. Material required to grade the Facility will be borrowed and/or removed from areas within the Facility disturbance or from the Road Rock Quarry.

Following grading, drainage structures will be installed. Adequate positive drainage will be needed for operation of the Facility, as well as for soil stability and erosion control. The drainage structures that will be installed at the Facility generally consist of corrugated metal pipe (CMP) culverts. Where drainage areas are too large for CMP culverts, precast concrete structures may be used. A large temporary sediment basin and/or pond will be constructed in the northwest area of the primary laydown yard for runoff control. Additionally, a diversion ditch will be constructed to divert runoff from the western portion of the rail track and the contributing watershed ("run-on" water) to the south, around the laydown yard and discharging the water to the north into Sugar Creek.

Once the site preparation is complete, aggregate material will be placed as needed for the laydown areas, access road, and to support the track bed. Following aggregate placement, the track materials (rail, cross ties, and fasteners) will be assembled to form the tracks and turnouts and the switches and crossings necessary to connect the Facility to the main line. Upon completion, all track components will be inspected and tested by Union Pacific to verify that they meet all design requirements and are properly installed.

Following construction of the CCSM Project, the Facility will be reduced in size as appropriate to meet the needs of the CCSM Project during operations and maintenance. Areas that are no longer needed will be reclaimed. Reclamation will generally consist of recontouring, reapplication of topsoil, and revegetation. Temporary erosion control measures will be used during reclamation to stabilize areas until revegetation is complete.

4.1 CONSTRUCTION SEQUENCE/SCHEDULE (8.2.2.2)

The Facility is scheduled to begin construction in September of 2014 and is anticipated to begin operations in April of 2016. Table 4 outlines the major activities required to construct the Facility and the estimated dates of completion. Due to the complexity of the Facility construction, the dates are subject to change due to the construction needs and timetable, climatic conditions, or other unforeseen circumstances.

Table 4. Facility Construction Schedule

Activity	Estimated Completion Date
Stake limits of disturbance and Facility features	TBD
Install perimeter control BMPs	TBD
Strip, segregate and stockpile topsoil	TBD
Install stockpile protection	TBD
Grade (cut / fill)	TBD
Correct and prepare subgrade	TBD
Install culverts	TBD
Complete final grade	TBD
Construct access road	TBD
Construct laydown yard	TBD
Construct diversion ditch and sediment basin/pond	TBD
Apply aggregate base	TBD
Install track	TBD
Recontour temporary disturbance	TBD
Install temporary stabilization BMPs	TBD
Respread topsoil	TBD
Revegetate	TBD

4.2 FACILITY AREA (8.2.2.3)

The total Facility site is estimated to be 372.7 acres; which includes all areas of temporary disturbance. Of the 372.7 acres of disturbance, only 121.2 acres are anticipated to be disturbed long-term (Table 5).

Table 5. Facility Area and Disturbance

Component	Initial Disturbance (acres)	Long-term Disturbance (acres)
Wye & Running Track	36.5	14.4
Lead Track	29.5	8.3
Loop & Other Track	112.0	43.6
Laydown Areas	181.1	50.8
Access Road	10.8	4.1
TOTAL	**369.9**	**121.2**

4.3 SUPPORT ACTIVITY STORM WATER DISCHARGES (8.2.2.4)

Support activities for construction of the Facility include laydown yards for equipment and materials, the Facility access road, and on-site borrow areas. All of these activities will occur within the 372.7 acre Facility site. Off-site borrow areas associated with the Facility may include the Road Rock Quarry. The disturbance and storm water discharges and controls associated with the Road Rock Quarry are detailed in the Road Rock Quarry Storm Water Pollution Prevention Plan.

The Facility design includes laydown yards and access roads that will be used during operations. PCW anticipates that any temporary access roads and laydown required to construct the Facility will occur within the footprint of the long-term laydown yards and access roads.

The Facility laydown yards are designed to accommodate soil and aggregate stockpiles, as well as vehicle fueling operations and some limited chemical storage. Along with a gravel surface to minimize discharge potential, the laydown yards will have temporary and permanent storm water controls including diversion berms, swales, and sediment basins/ponds, as described in Section 6. Sediment basins and ponds are designed to meet the requirements of Section 7.9 and 7.10 of the WYR10-0000 permit. Discharges of hazardous materials and non-storm water pollutants and chemicals will be controlled and prevented by using proper storage and handling procedures, such as secondary containment. An SPCC Plan has been developed for the Facility to prevent discharges of oil.

4.4 EXISTING SITE CONDITIONS (8.2.2.5)

The Facility site climate is classified as desert and semiarid steppe. Annual precipitation is approximately nine (9) inches. Temperatures vary, on average, between 12 degrees Fahrenheit in January to 83 degrees Fahrenheit in July. The Facility elevation ranges from 6,500 feet above mean sea level near Sugar Creek to nearly 6,800 feet along the north side of the rail yard loop. Refer to **Attachment C** for terrain maps and existing conditions maps.

4.4.1 Soils

Soils within the Facility site are primarily derived from sedimentary formations and are predominantly orthents. These are soils that are shallow to very deep and medium to fine textured and have a frigid temperature regime, an aridic moisture regime, and mixed or bentonitic mineralogy.

Geotechnical testing for the Facility was completed at 33 boring locations with drilling depths ranging from 10 ft to 40 ft. The results of this geotechnical testing indicate that the Facility is underlain by deep alluvial fine-textured soils and that depth to bedrock is generally 20 ft or greater.

Soils adjacent to the Union Pacific main line are characterized by two (2) to five (5) ft of fill material overlaying deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. Bedrock was not encountered during geotechnical testing in the area adjacent to the Union Pacific main line. The remaining areas of the Facility south of the Union Pacific main line are characterized by deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. No fill materials are present in the soils south of the Union Pacific main line. Steele Shale bedrock formations were encountered at locations within the southern third of the Facility site at depths generally ranging from 20 to 25 ft below ground surface.

4.4.2 Vegetation and Percentage of Existing Vegetative Cover

The Facility Site is primarily characterized by areas of salt desert shrub and sagebrush steppe. Sparsely vegetated, grassland, riparian, and barren communities are also present in the Facility Site, but make up only a small percentage of the vegetation communities. Vegetation communities were confirmed by SWCA Environmental Consultants (SWCA) in 2012 and 2013 across the CCSM Project Site, including the Facility Site. Wetland delineation data was collected in 2012 and 2013 to characterize the wetland plant communities within the Facility Site. Table 6 includes a summary of the vegetation communities within the Facility Site. Additional information on the vegetation communities within the Facility Site is included in the site-specific plan of development and site-specific reclamation plan for the Facility. Due to the linear nature of the Facility and the widely variable terrain, soils and climate the vegetative cover varies between 0 and 35%. For purposes of this SWPPP, site stabilization will occur when vegetation cover is approximately 70% of natural background cover (Attachment K).

Table 6. Vegetation communities within the Facility Site

Vegetation Community	Acreage	Percentage of Site
Shadscale saltbush	116.1	31.4%
Gardner's saltbush/greasewood	79.1	21.4%
Wyoming big sagebrush/threadleaf sedge	38.5	10.4%
Wyoming big sagebrush/greasewood	23.0	6.2%
Shadscale saltbush/Wyoming big sagebrush	21.7	5.9%
Gardner's saltbush	20.9	5.6%
Greasewood/saltbush/basin big sagebrush	15.1	4.1%
Threadleaf sedge	5.9	1.6%
Wyoming big sagebrush/bird's foot sagebrush	5.4	1.5%
Other[1]	13.2	3.6%
Disturbed/developed	31.1	8.4%
TOTAL	**369.9**	**100.0%**

Notes: (1) Greasewood, shadscale saltbush/black sagebrush, Wyoming big sagebrush/rabbitbrush, and greasewood/saltgrass each make up less than 1 percent of the total acreage of the Facility Site

4.5 POTENTIAL POLLUTION SOURCES (8.2.2.6)

Table 7 outlines the potential pollutants at the Facility and the location and/or source of the pollutant, along with the recommended control measures. Table 8 outlines potential non-storm water discharges for construction sites and whether the discharge is likely to occur at the Facility.

Table 7. Potential Pollution Sources

Potential Pollutant	Location or Source	Control Measure
Antifreeze	Equipment, vehicles, laydown yard	Drip pans, secondary containment, dry and secure storage
Diesel Fuel	Equipment, vehicles, storage tanks	Drip pans, secondary containment, double walled tanks, specific fueling areas
Gasoline	Equipment, vehicles, storage tanks, generators	Drip pans, secondary containment, double walled tanks, specific fueling areas
Hydraulic Oils and Fluids	Equipment, laydown yard	Drip pans, secondary containment, dry and secure storage
Grease and Lubricants	Equipment, vehicles, laydown yard	Drip pans, secondary containment, dry and secure storage
Glues / Adhesives	Laydown yard, application	Dry storage, dry application
Curing Compounds	Laydown yard, application for concrete	Dry storage, secondary containment, dry application
Concrete / Grout	Laydown yard, application at site locations, subsoil correction application areas	Secondary containment, dust control, designated washout areas, engineer-determined application rates for subsoil correction.
Trash and Debris	Dumpsters, trash cans in laydown yard and satellite locations	Plugs in dumpsters, covers as necessary, routine maintenance
Concrete Mortar	Laydown yard and application for culverts or other areas	Dry storage, dry application
Portable Sanitary Facility	Laydown yard, satellite locations	Routine maintenance, cleanout, secure facilities to soil, secondary containment
Coolant	Equipment, vehicles, laydown yard	Drip pans, secondary containment, dry and secure storage
Motor Oil	Equipment, vehicles, laydown yard, maintenance area	Drip pans, secondary containment, dry and secure storage
Detergents / Cleansers	Laydown yard and designated areas	Secondary containment, dry and secure storage

Table 8. Potential Non-storm Water Discharges

Type of Non-Storm Water Discharge	Likely to be Present at Facility?
Emergency fire-fighting	☐ YES ☒ NO
Fire hydrant flushing	☐ YES ☒ NO
Landscape irrigation	☐ YES ☒ NO
Vehicle and equipment washing	☒ YES ☐ NO
Dust control	☒ YES ☐ NO
Potable water line flushing	☐ YES ☒ NO
Routine external building washing	☐ YES ☒ NO
Pavement washing	☐ YES ☒ NO
Air conditioning or compressor condensate	☐ YES ☒ NO
Groundwater or spring water	☐ YES ☒ NO
Foundation or footing drainage	☒ YES ☐ NO
Construction dewatering	☒ YES ☐ NO

4.6 DRAINAGE AREAS/RECEIVING WATERS (8.2.2.7)

Table 9 lists the receiving waters for the Facility site and their stream classification and any applicable turbidity limits. Table 10 includes the outfall/discharge location, type and size for the Facility and supporting activities. See **Attachment D** for drainage maps and drainage area locations.

Table 9. Facility receiving waters, Stream Classifications and Turbidity Limits

Watershed Area	Watershed Name	Immediate Receiving Waters	Ultimate Receiving Waters	HUC12	Disturbed Acres	Impaired Waters?	303(d)?	Class 1?	Stream Classification	NTU Limit*
1	Lower Sugar Creek	Unnamed Tributaries and Sugar Creek	Lost Springs Draw and North Platte River	101800021303	42.5	No	No	No	3B	None
2	Unnamed	Unnamed Tributaries to Coal Creek	Sugar Creek	101800021304	318.9	No	No	No	3B	None
3	Grenville Dome	Unnamed Tributaries and drainages	Unnamed interior Basin	101800021005	8.5	No	No	No	N/A	None

Notes:
3B – Other aquatic life, recreation, wildlife, agriculture, industry, scenic value.
NTU - Nephelometric Turbidity Units
* The NTU limit listed is an increase from existing NTU at the time of discharge. Unnamed tributaries do not have a listed NTU limit.

Table 10. Facility outfalls

Outfall #	Discharge to:	Latitude	Longitude	Type and Size
1	Sugar Creek	41.77700464120	-107.14337960900	10' S&C Arch Culvert
2	Unnamed Tributary to Sugar Creek	41.77815222780	-107.16938416700	2-72" CMP Culverts
3	Unnamed Tributary to Sugar Creek	41.77519210480	-107.17077831900	3-10'x6' Box Culverts
4	Unnamed Tributary to Sugar Creek	41.76495228920	-107.16836164300	2-84" Culverts
5	Unnamed Tributary to Sugar Creek	41.75759280350	-107.16162773400	3-72" Culverts
6	Unnamed Tributary to Greenville Dome	41.75081401970	-107.13192113900	Overland flow

4.7 303(D) IMPAIRED WATERS, TMDL, AND / OR CLASS 1 WATERS (8.2.2.8)

The receiving waters for the Facility disturbance were checked against the State of Wyoming's 303(d), TMDL and Class 1 Waters location information. The Facility does not overlap with 303(d) listed waters and there are no existing storm sewer systems within the Facility site. There is a Class 1 River located approximately 13.3 miles from the Facility site. The North Platte River is listed as a Class 1 Waterbody starting at the confluence of Sage Creek and continuing upstream to the Colorado/Wyoming state line. The Facility storm water discharges occur downstream of this segment and thus will not degrade the water quality from a 2 year/24-hour storm event. See **Attachment D** for Class 1 and Main Stem Waterbody locations.

5.0 SITE MAP(S) (8.2.3)

Site maps are attached to this SWPPP. See **Attachment C** for the USGS Map, Existing Conditions Map and Soils Map. See **Attachment D** for the Drainage Area Map, Class 1 Waters Map and Impaired Water Body Map. See **Attachment F** for the Site Map, construction plan set and erosion and sediment control plan.

6.0 BEST MANAGEMENT PRACTICES (8.2.4)

PCW will implement best management practices (BMPs) to minimize the discharge of pollutants to surface waters. The following sections outline the BMPs that PCW will implement as appropriate to adequately control a typical 2 year / 24-hour storm event for the Facility. The 2 year / 24-hour storm event for the Facility is defined as 0.9 inches. Tables 11 through 13 describe the BMPs that will be implemented at the Facility during each stage of construction. See **Attachment G** for an alternate format of BMP details for contractor use on-site.

To identify whether erosion and sediment are adequately controlled, PCW will evaluate visible and measurable erosion. Visible or measurable erosion that is not adequately controlled is defined as:

- Deposits of mud, dirt , sediment exceeding one cubic foot volume in an area of 100 square feet or less on public or private roads, adjacent property, or into waters of the state by deliberate actions or as a result of water / wind erosion; or
- Evidence of: (1) concentrated flows of water over bare soils (rills / gullies); (2) turbid or sediment laden flows where runoff is not filtered, treated, or captured on-site using one or more of the BMPs specified below; or (3) earth slides, mud flows, earth sloughing or other earth movement which originates on the construction site and leaves the construction site.

If inspections indicate that the BMPs are not adequately controlling the 2 year / 24-hour storm event, the BMPs will be reviewed and additional or different BMPs will be applied. If the BMPs that must be applied are not contemplated in this SWPPP, PCW will amend this SWPPP and document the changes.

Table 11. Best Management Practices

Area	Activity	BMP
Facility site	All activities	Schedule work to minimize the duration of the disturbance and the amount of the disturbance.
Facility site	All activities	Schedule BMP installation to provide stable access.
Sensitive areas	All activities	Schedule work in sensitive areas (steeper slopes, riparian areas, stream crossings and conveyance crossings) within a forecasted dry period.
Facility site	Pre-disturbance	Stake or otherwise delineate the limits of disturbance to maintain designated footprint, minimize disturbance, and preserve vegetation to the extent practicable.
Facility site	Clearing	Install principal sediment perimeter controls (sediment traps and barriers, basin traps, sediment fences, culverts) as soon as possible.
Facility site	Clearing	Stabilize stream banks as soon as possible and install a principal runoff conveyance system with runoff control measures. Install the remainder of the systems after grading.

Area	Activity	BMP
Facility site	Clearing	Stabilize the normal wetted perimeter (from a 2 year / 24-hour event) to a point of at least 200 linear feet above the downstream disturbed soil limit or from the point of discharge to a surface water / conveyance.
Borrow areas	Clearing/ Excavation	Clear borrow areas only as needed.
Soil stockpiles	Excavation	Protect soil with perimeter sediment controls and temporary erosion controls in accordance with the site-specific reclamation plan for the Facility (e.g. mulch and seeding).
Access roads and laydown yards	Grading	Stabilize any bare areas with gravel and/or temporary mulch.
Facility site	Grading	Install key run-off control measures (runoff control diversions, perimeter dikes, water bars, outlet protection) before exposing more than 10 acres of land graded to a common point.
Facility site	Grading	Install runoff control measures during grading for critical areas of steeper slopes and areas near waterways and receiving waters.
Culverts	Installation	Install energy dissipation within 24 hours of culvert installation when feasible.
Facility site	Grading/ Reclamation	Apply temporary or permanent stabilizing measures (surface roughening, seeding, mulching, erosion control blankets, hydromulch, etc.) within 14 days to any disturbed areas where work has been either completed or delayed beyond 14 days.
Facility site	Reclamation	Reclaim all exposed areas in accordance with the site-specific reclamation plan for the Facility, including decompaction, seeding, and temporary stabilization. Remove all temporary control measures once areas are stable.

Table 12. Stabilization Measures and Applications

BMP	Area / Application	Temporary or Permanent (and Duration)
Straw or Hay Mulch	Areas and slopes flatter than 3:1; Larger stockpiles with flatter slopes	Temporary (1 year or less)
Hydromulch	Topsoil berms, stockpiles, areas too small for equipment access, slopes flatter than 3:1.	Temporary (6 months or less)
Bonded Fiber Matrix	Topsoil berms, stockpile areas too small for equipment, Areas flatter than 3:1; areas of 3:1 and steeper (up to 2:1) with less than 75 feet of length, areas of 3:1 and steeper with slopes greater than 75 feet in length*, areas inaccessible for equipment or too steep for blanket application.	Temporary (varies depending upon product but up to 18 months)
Erosion Control Blanket / Turf Reinforcement Mats (TRM)	Areas of 3:1 slope, less than 75 feet in slopes length, areas of 3:1 slope and greater than 75 feet in slopes length, Areas of concentrated flows (ditches)	Temporary (3 to 24 months) TRM: Permanent
Plastic Sheeting / Tarps	Areas of 3:1 slope with less than 75 feet of slope length, stockpiles	Temporary (up to 1 month) and for areas where active work is inevitable.
Rock Base / Aggregate Base	Traffic surfaces (roads), exit locations, parking areas, laydown yards, water and well extraction areas	Temporary and Permanent
Riprap	Scour protection, energy dissipation at culverts, pipes and pumps, slopes steeper than 2:1 and less than 75 feet in length, and channel side banks	Temporary and Permanent
Interim and Permanent Seeding	Stockpiles, erosion control for topsoil berms, slopes, soils not actively worked within next 30 days, interim reclamation areas, permanent reclamation areas	Interim and Final Reclamation

*Note: *Slope length of greater than 75 feet with grades of 3:1 or steeper will be graded with slope breaks such as terraces, benches, or V-notch back slope or will have fiber logs installed on contour to maintain sheet flow and minimize erosion potential.*

Table 13. Best Management Practices by Activity

Activity	Best Management Practice																				
	Preservation of Existing Vegetation	Scheduling	Surface Roughening	Diversion(s)	Energy Dissipation	Riprap Slope Stabilization	Erosion Control Blankets	Organic Mulch	Rock Mulch / Aggregate	Soil Binders / Tackifiers	Interim Seeding	Permanent Seeding	Wind Erosion Control	Vegetated Buffer	Sediment Barriers	Sediment Traps/Basins/Ponds	Rock Checks/ Rock Weeps	Topsoil Berms	Plastic Sheeting	Hydromulch	Bonded Fiber Matrix
Staking Limits of Disturbance	X	X												X	X						
Clearing and Grubbing Necessary to Install Perimeter Control	X	X	X	X			X	X			X	X	X	X	X	X	X				
Installing Perimeter Controls	X	X												X	X			X			
Remaining Clearing and Grubbing	X	X	X	X			X	X			X	X	X	X	X	X	X				
Stripping and Stockpiling Soil		X						X		X	X		X	X	X			X			
Grading		X	X	X			X	X			X	X	X	X	X	X	X				
Ditch/Culvert Installation	X	X			X	X	X				X	X		X	X						
Track Installation	X	X		X		X								X	X						
Access Road Construction	X	X	X	X	X		X	X	X	X	X	X	X	X	X			X			
Final Grading		X	X	X	X		X	X	X	X		X	X	X	X	X	X				
Laydown Yard Construction		X		X	X			X	X	X	X		X	X	X	X	X	X			
Diversion Ditch and Sediment Basin Construction	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X				
Stabilization	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

6.1 EROSION PREVENTION BMPS (8.2.4.1a)

PCW will implement BMPs to prevent visible and measurable erosion to the extent practicable, as described in Tables 11 through 13. Each erosion prevention BMP is described in additional detail below.

Surface Roughing (slope tracking) (See Detail TBD)
Surface roughing provides protection from water erosion and wind erosion. Surface roughness also promotes infiltration of water and results in less runoff. During grading PCW will use construction equipment to indent or track the surface of the soil in a perpendicular direction to the slope for the following disturbed areas and conditions, as practicable:

- Areas of 4:1 slopes with a distance of 75 feet in length and greater;
- All slopes of 3:1 and steeper;
- Areas within 200 linear feet of surface waters and conveyances;
- Areas of highly erodible soil and material;
- Topsoil stock piles

Surface roughing will be used for temporary erosion protection in conjunction with temporary and permanent seeding, mulching, hydromulch and other temporary stabilization techniques. Surface roughing should be applied for slopes, stockpiles and other critical and erodible areas which are exposed and will not be active for at least 7 calendar days.

Diversion(s)
A storm water diversion will be constructed around the southern perimeter of the Facility laydown yard. The diversion will be primarily used to intercept the drainage which is running onto the Facility site from the south and divert the water to the northwest around the active construction site. The diversion will be a trapezoidal channel with a flat bottom, 4:1 side slopes, and a gentle slope to minimize erosive potential. A combination of sediment, velocity and erosion control BMPs will be in conjunction with the channel.

Energy dissipation / Outlet Protection (See Detail ST02)
Energy dissipation at the discharge point of culverts, pipes, pumps or other point-source discharge will be used to prevent scour and erosion if the flow velocity is too great for the existing vegetation or if vegetation is not established. Energy dissipation may consist of plywood, plastic or tarpaulin for temporary, short-duration low velocity discharges. For longer duration or higher velocity flows, riprap will be used as energy dissipation at discharge outlets. Riprap will consist of well graded stones, angular (not round field stone) and weather resistant rock, generally with geotextile fabric underneath. If the riprap specifications are not provided by the engineer, the guidelines in Table 14 will be used:

Table 14. Riprap specifications

Pipe Diameter (inches)	Discharge* (ft^3/s)	Apron Length (feet)	Rip Rap D_{50} Diameter (Min inches)
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 8 12 16
24	30 40 50 60	16 26 26 30	8 8 12 16

Riprap Slope Stabilization

Riprap will be used for slope stabilization along portions of the rail track, as determined by the engineer. The rock size is shown in **Detail TBD.** Riprap slopes will not be vegetated as the riprap will provide the non-erosive surface and permanent stabilization.

Riprap may also be used as necessary along the slopes of the diversion channel where off-site flows may be concentrated. Additional slope stabilization may be needed to convey water from the top of the bank to the channel bottom. The location and necessity of riprap in the diversion channel will determined by the engineer based on field conditions. See **Detail TBD** for more information.

Erosion Control Blankets / Geotextile Fabric

Erosion control blankets (blankets) are blankets made from organic material held between a synthetic netting. Erosion control blankets are rolled out and stapled to the exposed soils on slopes (**Detail TBD**) and channelized flow areas (**Detail TBD**). The blankets provide a temporary non-erosive surface to control runoff water, minimize rills and gullies, and protect seed until vegetation establishment. The types of blanket used vary depending upon the application and flow factors. Table 15 below summarizes the different types of blankets, their applicability, and stapling recommendations.

All blankets will be applied to a smooth surface, free of rocks, sticks, stumps, and other debris. If vegetation is desirable, seed will be applied prior to application of the blanket. Head trenches, shingling and staples will be used as needed to prevent the runoff water from flowing under the blanket and causing rills and gullies.

Table 15. Erosion control blankets and applicability

Category	Longevity (approximate)	Acceptable Application Area	Typical Blanket Material	Staple / Anchor
1	2 to 3 Months	Flat areas (flatter than 4:1), shoulder drains and roadway shoulders.	Straw or wood fiber, one sided netting or netless (rapid degradable netting)	11 gauge, 4 inches long (6 or 8 inch staples for sandy soil)
2	9 Months	Slopes 3:1, 2.5:1, less than 50 feet long, ditches with gradients of 2% or less and velocities less than 3.5 ft/sec.	Straw or wood fiber, one sided netting	11 gauge, 4 inches long (6 or 8 inch staples for sandy soil)
3	9 Months	Slopes 3:1, 2.5:1, more than 50 feet long, ditches with gradients of 3% or less and velocities less than 4.5 ft/sec with less than 2 inches of flow depth.	Straw or wood fiber, double sided netting	11 gauge, 6 inch staples (8 inch for sandy soils)
4	1 to 3 years	Slopes up to 2:1, ditches with gradients of 4% or less, flow velocities less than 5.5 ft/sec with less than 3 inches of flow depth.	70% straw, 30% coconut or high velocity wood fiber with double sided netting	11 gauge, 6 inch staples (8 inch for sandy soils)
5	1 to 3 years	Ditch bottoms with gradients of 5% and less, flow velocities less than 6 ft/sec (with less than 4 inches of flow depth and water course banks within the normal flow elevation.	70% straw, 30% coconut with double sided netting	11 gauge, 8 inch staples
6	More than 3 years (Turf Reinforcement Mat – TRM)	Ditch bottoms with gradients of 6% and less, flow velocities less than 6.5 ft/sec and under 6 inches of flow depth.	Straw / Coconut or wood fiber, 3-dimensional netting	11 gauge, 8 inch staples
7	More than 3 years (Turf Reinforcement Mat – TRM)	Ditch bottoms with gradients of 7% and less, flow velocities less than 7 ft/sec and under 6 inches of flow depth.	Coconut or wood fiber, 3-dimensional netting	11 gauge, 8 inch staples
N/A	2 to 3 years	Temporary Ditch bottoms, temporary diversions where vegetation is not anticipated	Geotextile filter fabric	11 gauge, 8 inch

Organic Mulch

Mulch is an organic material spread by hand (in small amounts) or by equipment to cover the soil for temporary stabilization. Mulch is not currently shown on the Facility plans, but may be used as an alternative BMP. If vegetation is desired, PCW will add seed prior to mulch application. Mulch material can vary and includes: grain straw, grass straw, hay, or wood fiber material (e.g. wood mulch from beetle kill trees). Mulch is spread uniformly over soil to minimize the impact of the rain drop and subsequent sheet erosion potential. The straw mulch will be applied at a rate of 2 (two) tons (4,000 pounds) per acre. Once applied, the mulch will be disc anchored, crimped, or tackified to the soil. Mulch will be applied on slopes up to 3:1 and in areas of non-concentrated flow.

Rock Mulch / Aggregate

Rock mulch / aggregate base will be applied for roads, parking areas, laydown yards and other areas with vehicle access to limit rutting and soil erosion from vehicles and equipment. The rock mulch / aggregate base may be temporary in some areas. Cement stabilization and geotextile liners may be used in areas where compaction may not be sufficient to limit rutting.

Soil Binders/Tackifiers

Soil binders and tackifiers are a temporary erosion control measure for wind and water erosion that will be used as needed on gentle slopes, exposed surfaces, and stockpiles of erodible material which are going to be re-disturbed at a future date. Binders may include natural plant-based material, polymeric emulsions, or cementitious material (Table 16). For areas where vegetation will be the final stabilization method PCW will only use plant-based, short-lived material to prevent the binder from prohibiting vegetation growth in the future. Once an area is treated PCW will avoid re-disturbance, vehicular traffic, or foot traffic until the area is ready to be actively worked. PCW will consider the following when applying binders:

- Binders are temporary and will likely need to be reapplied to maintain effectiveness.
- A curing time of 24 hours or longer is necessary for most binders (consult manufactures guidance).
- Low temperatures may prevent curing (consult manufactures guidance).
- Heavy or intense rain fall events may cause isolated to wide spread failure of binders due to concentrated flows / rills.
- Compacted silt and clay material may not react well to binder application due to the semi impervious nature of the material.
- Binders should be applied when wind speeds are manageable to avoid over-spraying.

Table 16. Examples of Binders and Tackifiers

Plant Based: Short Lived	Plant Based: Long Lived	Polymeric Emulsions	Cementitious
Guar Gum, Psyllium, Starch / Polymers Example Manufactures Name: XL™ Tack 30™ RX2000™	Pitch and Rosin Emulsion	Acrylic Copolymers, Liquid Polymers or Methacrylates and Acrylates, copolymers, Liquid Acrylamides, Poly-Acrylamide and Copolymer or Acrylamide, and Hydro-colloid Polymers Example manufactures name: PAM-40™, SpecTac™	Gypsum

Wind Erosion and Dust Control

PCW will use the following methods, recommendations, and practices to prevent or minimize dust and wind erosion for the Facility. The practices will be selected based on activity, climate and adequacy of the controls and in accordance with the Dust Control Plan for the CCSM Project. The five main categories for dust and wind erosion control include:

1. Design Solutions
2. Temporary Controls
3. Control Using Additives
4. Mechanical Controls
5. Operational (or behavioral) Controls

Discharges from dust control are not anticipated to cause pollution. During dry conditions when dust control is needed, the water will be absorbed into the soil. If runoff does occur, the BMPs described in this SWPPP will adequately control the runoff.

Design Solutions

- Plan soil grading and disturbances to minimize exposure before surfacing is applied or stabilization begun.
- Where appropriate, design roads and laydown yards to have gravel surfaces.
- Balance cut/fill earthwork to avoid unnecessary stockpiling of materials to the extent possible.
- Locate stockpiles down-wind of construction activities, buildings, and other dust sensitive sites where possible.
- Establish temporary vegetation as quickly as possible in accordance with CCSM Project's Master Reclamation Plan.

Temporary Controls

- Schedule activities to reduce soil exposure
- Surface roughing
- Riprap slope stabilization
- Erosion control blankets and geotextiles
- Organic mulch
- Rock mulch
- Soil binders and tackifiers
- Vegetation establishment

Control Using Additives

- Water applied using water trucks with controlled applicators
- Magnesium Chloride or other commercial dust suppressants applied based on weather conditions and traffic loads. (*NOTE: In accordance with current BLM policy, PCW will not apply chloride compounds or lignin derivatives within 500 feet of a perennial stream on federal lands.*).
- Soil binders and tackifiers applied as needed

Mechanical Controls

- Tarps or plastic sheeting can be used on trucks and small stockpiles for temporary coverings. Covers must be anchored to prevent removal by wind.
- Wind barriers made of soil berms, fabric or wooden structures to shield sensitive areas from repeated heavy winds.

Operational (behavioral) Controls

- Speed restrictions due to high winds and other site conditions, 25 mph or less for dirt roads and 40 mph or less for gravel roads.
- Restrict height and speed at which materials are placed.
- Confine loading and unloading procedures to the downwind side of storage piles.
- Minimize access to areas without stabilized or treated surfaces and roads where feasible

Interim Seeding

Interim seeding will be used as appropriate in conjunction with other temporary stabilization BMPs such as mulch, hydromulch, erosion control blankets or temporary, short term soil binders to control erosion and stabilize soils. Interim seeding will be used in accordance with the site-specific reclamation plan for the Facility, including site preparation and seed application considerations. PCW will consider the following when implementing interim seeding:

- Other means of stabilization (such as gravel or aggregate) may be more appropriate for areas within continuous traffic.
- Seeding should be timed appropriately for favorable temperature and moisture of the area per the site-specific reclamation plan for the Facility.
- Seeding should be used on slopes of 2:1 and steeper only in conjunction with other stabilization measures.

Permanent Seeding

Permanent seeding will be implemented following completion of construction activities and during final reclamation. Seed will be applied to all areas not otherwise covered with a permanent erosion control BMP (such as riprap, gravel or aggregate). Permanent seeding will be done in accordance with the site-specific reclamation plan for the Facility.

6.2 SEDIMENT CONTROL BMPS (8.2.4.1b)

In addition to the BMPs for erosion prevention, PCW will implement BMPs to control sediment to the extent practicable, as described above in Tables 11 through 13. Each sediment control BMP is described in additional detail below.

Vegetated Buffer

A vegetated buffer is an area located outside of the limits of disturbance where vegetation will be left intact. PCW anticipates using vegetated buffers at the Facility only as secondary sediment control. If the buffer becomes covered with sediment, develops rills, gullies or is otherwise ineffective, PCW will implement additional BMPs up-gradient and at the perimeter of the Facility as needed. Where vegetated buffers are used at the Facility, PCW will consider the following:

- Buffers should have non-compacted soils;
- Buffers are best used near waterways and conveyances; and
- Existing buffers should be preserved for unstable slope areas.

If a vegetated buffer is a used at the Facility as a primary sediment control for treatment prior to discharge, it will meet the following requirements:

- Minimum width of 25 feet for every 125 feet of disturbed area draining through the buffer;
- For each additional 5 feet of disturbance, an additional 1 foot of width will be added,
- The buffer width will have a slope of 5% or flatter;
- The disturbed area draining to the buffer will have a slope of 6% or flatter;
- Concentrated flows will be minimized through the buffer;
- No more than 10% of the buffer will be woody material;
- The buffer will have dense vegetation between 3 to 12 inches in height and have a 90% uniform coverage of the soil where possible; and
- Where 90% existing vegetation coverage is not present, PCW will add up-gradient sediment and erosion control BMPs.

Sediment Barriers

PCW will use sediment barriers at the perimeter of activities where there is a positive slope with the potential of impacting surface waters, conveyances, creeks, rivers, or other waters of the state. Generally, PCW will install sediment barriers if there are exposed soils within 200 linear feet up-gradient from surface waters and where slopes are less than 5%. Sediment barriers include the following:

1. Silt fence
2. Fiber logs
3. Top soil berms
4. Rock checks / weepers

Silt Fence

Silt fences will be used as appropriate to retain soil prior to or at the Facility perimeter where sediment discharge may pose an impact to surface waters. Silt fences will be installed according to Detail GD03 in the plan set. Silt fences will be placed taking into consideration the following:

- Fences will be installed at minimum 3-5 feet from the toe of a slope to avoid damage from equipment during grading and to allow for space to accumulate and clean out sediment.
- Silt fence will not be used in areas of concentrated flow such as across ditches, conveyances or near a culvert end.
- As a general rule, silt fences will be placed in a watershed at a ratio of 100 feet of silt fence per 10,000 square foot of drainage area.
- Wire backing could be used to provide additional support and longevity to the silt fence as needed.
- Silt fence may be subject to failure in high winds. In areas that are routinely subjected to high winds, PCW will consider using fiber logs.

Fiber Logs

Fiber logs are wheat or rice straw or wood chip material rolled in a tubular form and netted. Fiber logs will be installed as appropriate for perimeter control around stockpiles and in small watersheds (**See Detail TBD**). Fiber logs may also be spaced in succession in concentrated flows, such as ditches, to provide sediment and velocity control. In addition, fiber logs may be placed on contour as a slope break (**See Detail TBD**). When used as a slope break, fiber logs will be placed in succession across the face of a slope at a maximum of 75 feet apart. Specific recommendations for spacing are dependent upon slope, but the following guidelines will be used:

- 1:1 slopes = 10 feet apart
- 2:1 slopes = 20 feet apart
- 3:1 slopes = 30 feet apart
- 4:1 slopes = 40 feet apart

Fiber logs will be a minimum of 9" (nine inches) in diameter and will be installed per **Detail TBD**. When using fiber logs, PCW will properly prepare the soil to avoid gaps and "bridging" or will dig a small trench, up to 2" in depth, for the fiber log. Following placement of the fiber logs, they will be staked every 2' on center.

*Rock Check / Rock Weepers (See **Detail TBD**)*

A rock check or rock weeper will be used as appropriate for velocity control and sediment filtration. Rock checks will be used in the diversion channel and in areas of storm water discharge where other sediment barriers and perimeter controls are shown to be ineffective. When installing rock checks and weepers, PCW will consider the following:

- Well graded crushed rock (riprap) with rock size between 3" and 6" is most appropriate.
- The following equation is appropriate for spacing:
  SPACING = [HIEGHT OF ROCK CHECK (FEET) X 100] / SLOPE GRADIENT.
- Geotextile fabric under the rock with a head trench can be used to minimize undermining and failure of the check.

- The terminal ends of the check must be at a higher elevation than the midpoint to prevent water from bypassing the check.

Soil Berms
During grading of the access roads and rail track where proximity to surface waters is greater than 200 linear feet or in areas where additional perimeter control is desired, PCW may use soil to provide a small 1 foot to 3 foot berm with maximum side slopes of 2:1. Soil berms will be compacted with equipment and temporarily stabilized with soil binder, hydromulch, or bonded fiber matrix to minimize erosion as they function as sediment control. Soil berms will only be used in areas of sheet flow. Where necessary a rock weeper may be installed in low areas or where concentrated flow may compromise the berm. Berms will be placed in areas where drainages do not exceed 0.25 acre per 100 feet of berm length and where flow velocity is not expected to exceed 1 cubic foot per second (in a 2 year/ 24-hour storm event).

Berms in succession or berms used in conjunction with other BMPs may be used in areas which exceed the parameters listed above. Table 17 provides recommended spacing of soil berms based on slope.

Table 17. Recommended Soil Berm Spacing

Slope	Slope Length	Berm Dimensions (height x width)
<50:1	250 feet	1 feet x 2 feet
50:1 . 10:1	125 feet	1 feet x 2 feet
10:1 . 5:1	100 feet	1 feet x 2 feet
3:1 . 2:1	50 feet	1.3 feet x 2.6 feet
>2:1	25 feet	1.5 feet x 3 feet

Temporary Sediment Pond
The Facility is designed with temporary excavated sediment ponds. The ponds are designed to the 2 year / 24-hour rain event, with more than 2 acre feet of storage required based on the size of the watershed. Pond calculations can be found in **Attachment J** of this document *(to be provided based on Issued for Construction Plan set).*

The sediment ponds are designed to collect, treat and control the discharge from an area larger than 10 acres discharging to a common point. The pond will treat the water prior to discharge off-site. The ponds are designed to:

- Collect and treat water for sediment removal prior to discharge;
- Control the rate of discharge and prevent floating debris from clogging the outlet;
- Draw down completely by use of a pump if necessary for maintenance;
- Discharge excess water volume via stabilized emergency overflow (EOF). The EOF will likely be geotextile fabric and riprap.
- Meet the WYR10-0000 permit requirements.

Temporary Sediment Trap

A sediment trap is a small excavation or surface impoundment which intercepts runoff water and detains it for velocity reduction and sedimentation. The trap will be used in smaller watersheds (less than 5 acres) and for smaller applications. Trap placement at the Facility will include the following, as appropriate:

- Downstream of wash stations
- At diversion outlets
- At slope drain outlets
- At pump outlets

Sediments traps will be field placed and constructed to meet the following parameters:

- Maximum slopes of 2:1;
- Embankment or excavation less than 5 feet in depth;
- Compacted embankment;
- Riprap spillway or a berm of sandbags, bales or soil, as appropriate;
- Spillway at least 4 feet long per 1 acre of drainage with an additional 2 feet of length for every acre of drainage up to 5 acres; and
- Volume of 1,800 cubic feet per acre of drainage.

6.3 STABILIZATION MEASURES (8.2.4.1c)

BMPs will be used for temporary stabilization as described in Tables 11 through 13. Temporary stabilization prevents the loss of soil and can also be used to protect and enhance seed germination for temporary and permanent revegetation. The non-vegetative BMPs (e.g. rock) are used to stabilize roads, parking areas, and laydown yards, as well as to provide protection at discharge locations. Stabilization measures are described in detail below.

Plastic Sheeting / Tarp

Plastic sheeting and tarps will be used at the Facility as appropriate to provide temporary stabilization. Plastic sheeting is generally most appropriate for stockpiles of erosive material and small areas of exposed erosive soil in critical locations (such as waterway slopes, culvert locations). Where plastic sheeting is used, the temporary sheeting will be employed within 14 days and will remain in place until at other BMPs are applied or until the area is once again active. The plastic sheeting will be dark in color to resist photo degradation and approximately 6 (six) mil thickness or greater. Plastic sheeting will be secured with rope and sand bags or rock bags; stapling or other punctures will be minimized. Where water may undermine the plastic, the terminal end of the plastic will be trenched into the soil to maintain water flow on top of the plastic. The material will be reused until the useful life is expended.

Organic Mulch

Refer to Section 6.1 of this SWPPP.

Hydromulch
Hydromulch is a blend of paper, wood or straw fibers with a soil binder or tackifier. Seed can be added to the mixture to have a one-step application of temporary erosion and wind control with means for establishment of temporary or permanent seed. Hydromulch will be used as appropriate for temporary stabilization of stockpiles, slopes up to 3:1, and other areas of exposed soil that are not exposed to high velocity concentrated flow. Hydromulch will generally be used for small areas where equipment access is not available for organic mulching or erosion blanket application. Hydromulch is not as long lasting as Bonded Fiber Matrix (BFM), nor is it as strong as BFM for steeper slopes.

Bonded Fiber Matrix
Bonded Fiber Matrix (BFM) is similar to Hydromulch in the application method (spray application), but BFM is longer lasting and can be applied for slopes steeper than 3:1. BFM consists of fibers, straw or wood, and a tackifier, binding agent, or other emulsion that forms a 3-dimensional protective layer. Two BFM products that may be used are Flexterra® or EarthGuard®. BFM will be used for temporary erosion and wind control where up to 18 months of temporary cover is desired or where conditions are too extreme for hydromulch. BFM will be considered as appropriate for temporary cover during final reclamation.

Erosion Control Blanket
Refer to Section 6.1 of this SWPPP.

Rock Mulch / Aggregate
Refer to Section 6.1 of this SWPPP.

Interim Seeding
Refer to Section 6.1 of this SWPPP.

Permanent Seeding
Refer to Section 6.1 of this SWPPP.

6.4 CONSTRUCTION SITE DEWATERING (8.2.4.2)

Groundwater was not encountered during the geotechnical investigation of the Facility (Fugro 2012). Groundwater in the Facility site is likely random and seasonal; therefore, PCW cannot accurately predict whether groundwater will be encountered during construction of the Facility. If there has been no recent precipitation and there is significant accumulated water in an excavation (indicating groundwater may be present), then PCW will apply for a WYPDES wastewater permit. If an area is normally dry and dewatering is only required due to precipitation, then PCW will implement the BMPs listed in this section.

If necessary, dewatering at the Facility will likely be required for excavations or structure footings and foundations. If drains are necessary for any structure footings and foundations the drain will have a plug or cap in place to prevent accidental discharge during activities that may cause pollution. For structure footings and foundations, as well as excavations, if water from excavation dewatering is not visibly clean (turbid), the accumulated water will be held prior to discharge until the suspended sediment has

sufficiently settled. If the water must be pumped before sufficient settling occurs, PCW will use dewatering bags, flocculants, and / or surface pumps as appropriate. Where feasible, the water will be discharged to a stable, relatively flat, vegetated ground and allowed to infiltrate into the soil. Visibly clean water (not turbid) from dewatering will be discharged to vegetated areas, agricultural land, ditches, or other conveyance and will be allowed to infiltrate or drain along existing drainages provided that the water does not cause flooding. Alternatively, if allowed by local permits and regulations, uncontaminated water from excavation dewatering may be discharged directly to receiving waters. At any time that water from dewatering is discharging into a receiving water, PCW will sample the discharge and the receiving water for turbidity periodically.

Pump Diversion (See Detail TBD)

If in-stream work is necessary and approved, a pump diversion will be implemented to allow construction work to occur. A pump diversion generally consists of a rock or sand bag berm to isolate the area, a pump, suction and discharges hoses, and energy dissipation at the end of the discharge hose. Construction activities requiring a pump diversion will be scheduled during a forecasted dry period when feasible. Additionally the pump diversion will be started and completed within 24 hours when practicable.

Sump with Rock Base (See Detail TBD)

If an excavated area, footing or foundation needs to be dewatered, a sump with a rock base will be used where appropriate. A sump with a rock base is simply a low spot in the excavation where rock is placed and a bucket or perforated barrel is placed on top of the rock base. Rock is then filled in around the perforated barrel and an intake hose is positioned near the top of the water column and connected to a pump. The discharge hose from the pump is then positioned in a vegetated area with energy dissipation as appropriate. Alternatively a dewatering bag can be used for additional sediment retention. The rock base provides an area for the pump to draw water without drawing sediment or soil material from the excavated area.

Energy Dissipation (See Detail TBD)

Refer to Section 6.1 of this SWPPP.

Dewatering Bags

A dewatering bag is a bag made of fabric or geotextile material that allows water to pass while retaining sediment inside the bag. Where appropriate, PCW will use a dewatering bag in conjunction with the sump with rock base, as described above. The dewatering bag will be of sufficient size for the rate and volume of water being discharged. A 7.5 foot x 20 foot dewatering bag is anticipated to be sufficient for most applications in the Facility. The bag will be placed within a vegetated area, on wooden pallets and /or on a trailer to facilitate removal. Where feasible, PCW will wait 1 to 3 days to allow sediment to settle before pumping it through a dewatering bag. Table 18 includes typical specifications for dewatering bags used in application similar to those anticipated at the Facility.

Table 18. Dewatering bag specifications

Property	Test method	MARV
Tensile Strength (Grab)	ASTM D-4632	205 pounds
Elongation	ASTM D-4632	50%
Puncture	ASTM D-4833	110 pounds
Mullen Burst	ASTM D-3786	350 psi
Trapezoidal Tear	ASTM D-4533	80 pounds
UV Resistance	ASTM D-4355	70%
Apparent Opening Size	ASTM D-4751	Maximum 0.18 mm (0.15 mm preferred)
Permittivity	ASTM D-4491	1.5 sec -1
Water Flow Rate	ASTM D-4491	110 gpm/ft 2
Note: MARV – Minimum Average Roll Value		

Sediment Traps

Sediment traps may be used at the Facility in dewatering applications. There are three main types of sediment traps that PCW will consider: (1) earthen; (2) dumpster; and (3) hay bale and plastic sheeting. All sediment traps at the Facility will be of sufficient size to contain the anticipated volume of water from the dewatering operation.

Earthen sediment traps are temporary excavated areas that serve as settling pools. Material excavated to construct the trap will be bermed around the trap to minimize the inflow of water from surrounding undisturbed areas. Water that accumulates in the trap will be left to infiltrate or evaporate over time whenever feasible; if not feasible, dewatering will occur after allowing sufficient settling time.

Dumpster sediment traps are clean dumpsters lined with poly sheeting that are used to contain water discharged from the dewatering operation. Water pumped into dumpster sediment traps will be allowed to settle prior to removal. Following removal of water from the trap, the sediment and poly sheeting will be properly disposed of. Dumpster sediment traps will be used where earthen sediment traps are not feasible or desired.

Hay bale and plastic sheeting sediment traps may be used in areas where small volumes of water are expected. To create a hay bale sediment trap, hay bales are positioned in a rectangle or square and secured to the soil. The area inside the bales is then lined with poly sheeting to create a basin. Water contained in hay bale traps will be allowed to either evaporate or settle prior to pumping.

7.0 OPERATIONAL CONTROLS (8.2.4.3)

PCW will use the BMPs described below in the day-to-day operations of the Facility to reduce the contribution of pollutants in storm water runoff.

7.1 GOOD HOUSEKEEPING (8.2.4.3a)

Litter and Debris (solid waste)

- PCW will locate dumpsters away from watercourses, streams, creeks and other surface waters or conveyances.
- PCW will regularly inspect dumpsters and report excess litter and solid waste and request pickup and retrieval of wastes.
- PCW will require workers to deposit waste, litter, and debris into dumpsters at the laydown yards and/or in various satellite locations where work is active.
- Dumpsters will be supplied and maintained by a waste management company.

Chemicals

- Gasoline, oil, paint, solvents, and other chemicals will not be stored in contact with soil or water and will not be released to soil or water.
- Oil will be handled in accordance with the Spill Prevention Control and Countermeasure (SPCC) Plan for the Facility.
- All chemicals will be kept in their original container, with original labels still attached, unless the container is not re-sealable. If chemicals are transferred to new containers they will be properly marked.
- Hazardous materials will be stored in designated areas.
- PCW will implement a chemical products management program to control the types and amounts of hazardous materials brought on-site.
- Chemical products and wastes that pose a pollution hazard will be stored within secondary containment.
- Waste will be removed from the site on a regular basis and disposed of in accordance with federal, state and local regulations.
- Spill kits will be clearly labeled and will be kept on-site in close proximity to where chemicals are being stored or used.
- All spills will be cleaned up as soon as practicable in accordance with applicable federal, state and local regulations.

Vehicle Maintenance and Washing

- PCW will properly maintain all vehicles and equipment.
- Separate areas will be designated for vehicle maintenance and washing unless appropriate equipment, e.g. oil/water separator, is provided.
- Areas for vehicle maintenance and washing will be surfaced with gravel or concrete.
- A barrier will be provided under gravel surfaces to retard infiltration.
- PCW will supply containment berms, diversion berms and spill kits for vehicle maintenance and washing areas, as appropriate.
- PCW will inspect vehicles and equipment for leaks prior to washing; if leaks are found, vehicle will not be washed until leaks are repaired.

Detergents

- PCW will limit the use of detergents containing phosphorus on site.
- PCW will properly contain water containing detergents.
- Do not allow water containing detergents to discharge into surface waters or conveyances.
- Detergents will only be used in designated areas for rinsing vehicles or equipment.
- PCW will store detergents in a dry, secure storage area with secondary containment.

Pesticides and fertilizers

- PCW will follow all federal, state, and local regulations that apply to the use, handling, or disposal of pesticides and fertilizers.
- PCW will store pesticides and fertilizers in a dry, secure storage area with secondary containment.
- PCW will follow the manufacturer's recommended application rates and methods.

Portable Sanitation Facilities

- PCW will locate portable sanitation facilities away from watercourses, streams, creeks and other surface waters or conveyances.
- PCW will secure portable sanitation facilities to the soil or other non-movable structure to prevent tipping from wind or other factors.
- PCW will schedule routine maintenance and regular cleanout with a licensed sanitary waste company.

Sediment Retrieval / Recovery

- Accumulated sediment will not be washed or diluted into waterbodies or other surface waters and conveyances (such as ditches).
- Where sediment must be retrieved or recovered from off-site locations, the material will be recovered within seven (7) calendar days of discovery or prior to the next rainfall event (whichever is soonest). If access is not available or conditions are not safe, PCW may delay sediment removal until conditions are acceptable. PCW will document the reason for the delay.
- PCW may delay sediment retrieval due to wet or muddy conditions where more damage would likely result from attempting to retrieve the sediment. PCW will implement additional BMPs as needed until the material can be retrieved. PCW will document the reason for the delay and the BMPs used.

- If removal sediment will cause more discharge of sediment and impact to a critical area (such as a vegetated riparian area), PCW will seed and stabilize the sediment delta if acceptable to the landowner. PCW will document the determination, landowner acceptance and the BMPs used.

7.2 BULK STORAGE OF PETROLEUM PRODUCTS AND SPILL REPORTING (8.2.4.3b)

Consult the Spill Prevention Control and Countermeasure (SPCC) Plan for the Facility for additional information on oil handling procedures and spill reporting and response requirements.

7.3 CONCRETE WASHOUT AND OTHER RELATED WASTE (8.2.4.3c)

Mobile Concrete or Mortar Mixers

- PCW will store bags of concrete and mortar in a dry storage area.
- PCW will position mixers at least 100 feet from the nearest watercourse or conveyance unless a temporary berm is installed to prevent runoff into the watercourse or conveyance.
- PCW will use tarpaulins or plastic sheeting to prevent concrete or mortar from contacting the soil
- PCW will use buckets to contain washout / rinse water when cleaning the mobile mixer
- PCW will dump buckets of washout water in a designated concrete washout area

Concrete Washout (See Detail TBD)

- PCW will contain washout water from the tools, equipment, concrete trucks, mobile mixers or other containers to prevent discharge into waters of the state or drainage onto adjacent properties.
- PCW will define the washout area and will post signage notifying the contactors of the location and use.
- PCW will establish washout areas of sufficient size to contain the expected washout material. PCW anticipates that 10’x10’x3’ will suffice for most activities.
- PCW will use thick poly sheeting to prevent contamination of the soil and infiltration of the washout material.
- PCW will dispose of the washout material once hardened. If the material is water or not hardened, the material will be vacuumed and hauled off-site to a proper disposal facility.

7.4 EMPLOYEE TRAINING (8.2.4.3e)

PCW will conduct employee training to inform personnel of their responsibilities in implementing the practices and controls included in this SWPPP. The training will be commensurate with the employee's responsibilities and will be conducted prior to construction activity, and at least annually thereafter. New employees will be trained within two weeks of hiring. Personnel that will be trained in the requirements of this SWPPP include:

- Personnel responsible for the design, installation, maintenance, and/or repair of storm water controls (including erosion control, sediment control and pollution prevention measures);
- Personnel responsible for the application and storage of chemicals, hazardous materials (including spill response and good housekeeping);
- Personnel who are responsible for conducting inspections; and
- Personnel who are responsible for taking corrective actions.

PCW will document employee training in a form similar to that presented in **Attachment H**. All training documentation will be kept up to date and will be maintained on-site with this SWPPP.

8.0 MAINTENANCE (8.2.5)

Table 19 provides an overview of the conditions and observations that warrant maintenance of BMPs, as well as the interval or timeframe in which the maintenance will be completed. Unless otherwise noted, the time frame is from the date of the inspection report noting the observation and the need for maintenance. PCW will use the Corrective Action Log (**Attachment E**) to record maintenance and corrective actions. All documentation concerning maintenance and corrective actions will be retained on-site with this SWPPP and will be updated as maintenance items are completed.

Table 19. Maintenance Conditions and Requirements

Best Management Practice	Observed Condition(s) for Maintenance	Maintenance Interval / Schedule
Preservation of Existing Vegetation	• Encroachment of construction or equipment / vehicles • Excessive sediment • Rills or visible erosion	Maintain or identify alternate BMPs within 7 calendar days.
Scheduling (Minimize Exposure)	• Scheduling does not match forecasted weather, agency requirements or other factors.	Update schedule and implement changes as necessary; document changes in SWPPP within 30 days.
Surface Roughing	• Soil becomes rutted or smoothed • Rills or gullies form	Rework or maintain surface roughness within 7 calendar days or prior to a forecasted rain event of 0.5 inches or greater whichever is soonest.
Slope Drains	• Undermining of the inlets • Scour at the outlets • Pipe becomes loose • Sediment plugs more than 1/3rd of the pipe	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Energy Dissipation (scour prevention)	• Undermining of the fabric • Water flowing around the rock • Scour • Sediment plugging	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.

Best Management Practice	Observed Condition(s) for Maintenance	Maintenance Interval / Schedule
Erosion Control Blankets	• Blanket not making adequate contact with the surface • Inadequate stapling • Head trench or overlap not adequate	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Organic Mulch	• Coverage inadequate or not uniform • Mulch blowing or washing away	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Rock Mulch / Covering	• Inappropriate rock size • Rills forming • Rock washing • Significant rutting	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Soil Binders / Tackifiers or Hydromulch	• Material not applied from two directions • Shadowing • Surface disturbance • Rills forming • Other significant erosion	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Temporary Seeding	• Seed bed not prepared • No germination • Rills, gullies or other runoff events • Vehicle tracking	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest. In areas of concentrated flows identify alternate or additional BMPs.
Permanent Seeding	• Seed bed not prepared • No germination • Rills, gullies or other runoff events • Vehicle tracking	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest. In areas of concentrated flows identify alternate or additional BMPs.
Wind Erosion / Dust Controls	• Significant dust	Maintain within 48 hours by reapplying BMPs and enforcing controls.
Vegetated Buffers	• Encroachment of construction or equipment / vehicles • Excessive sediment • Rills or visible erosion • Insufficient buffer size	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest. Identify alternate or additional BMPs as needed.

Best Management Practice	Observed Condition(s) for Maintenance	Maintenance Interval / Schedule
Diversions	• Sediment accumulation • Visible erosion damage • Damage to control, vegetation or rock	Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest.
Sediment Barriers	• Barrier flat, torn, or otherwise nonfunctional • Sediment accumulates to 1/3rd of the original designed or intended height	Active sites: Within 24 hours of discovery or as conditions allow if inaccessible. Inactive sites: Within 14 calendar days of discovery or as conditions allow if inaccessible.
Temporary Sediment Ponds and/or Basins	• Lack of vegetation • Basin erosion • Scour protection compromised • Sediment accumulates past ½ of the storage volume	Stabilization and scour protection: Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest. Remove accumulated sediment: *Active sites*: Within 72 hours of discovery or as conditions allow access if inaccessible. *Inactive sites:* Within 14 calendar days of discovery or as conditions allow if inaccessible.
Temporary Sediment Traps	• Lack of vegetation • Basin erosion • Scour protection compromised • Sediment accumulates past ½ of the storage volume	Stabilization and scour protection: Maintain within 7 calendar days or prior to the next forecasted rain event of 0.5 inches or greater whichever is soonest. Remove accumulated sediment: *Active sites*: Within 72 hours of discovery or as conditions allow access if inaccessible. *Inactive sites:* Within 14 calendar days of discovery or as conditions allow if inaccessible.

Best Management Practice	Observed Condition(s) for Maintenance	Maintenance Interval / Schedule
Rock Checks / Rock Weepers	• Water flowing around or undermining rock • Sediment accumulates past 1/3 of the original designed or intended height • Rock damaged	Active Sites: Within 24 hours of discovery or as conditions allow access if inaccessible. Inactive Sites: Within 14 calendar days of discovery or as conditions allow access if inaccessible.
Soil Berms	• Visible erosion • Water flowing around berm • Scour	Active Sites: Within 24 hours of discovery or as conditions allow access if inaccessible. Inactive Sites: Within 14 calendar days of discovery or as conditions allow access if inaccessible.

9.0 INSPECTIONS (8.2.6, 9.1 – 9.10)

Facility construction and all support activities will be inspected in accordance with the schedule in Table 20. The inspector will be familiar with the requirements of this SWPPP and the permit conditions, as well as be knowledgeable and experienced in the application, installation, inspection, and maintenance of erosion and sediment control BMPs. Inspections will cover all permitted areas and will include at minimum: (1) the construction site perimeter (limits of disturbance); (2) any material and/or waste storage areas exposed to precipitation; (3) areas where storm water discharges from the sites; (4) areas where vehicles leave the site; (5) areas where vehicle maintenance occurs; and (6) all site BMPs.

Table 20. Inspection Schedule

If the site is:	Then an inspection is needed:	Notes and Information
Active	Once every 14 calendar days and within 24 hours of any precipitation or snow melt event which exceeds 0.5"	Rain fall data will be documented from the Rawlins Municipal National Weather Service Reporting Station (9.8 miles) from the Facility.[1]
Inactive	Once every 30 calendar days	Only allowed once earthwork and construction activities are complete, temporary or permanent stabilization is initiated, and BMPs are installed per this SWPPP.
Inactive or delayed due to weather or other dangerous conditions	As soon as feasible based on s conditions	If access is not available due to weather (snow fall, wet conditions, fire, and severe weather) or other dangerous conditions, the reason for the delayed inspection must be documented and the inspection must take place as soon as access is feasible.
Areas that meet final stabilization	Not Required	Where areas have achieved final stabilization those areas must be documented and then inspections are no longer required.
Inactive due to winter conditions	Not Required	Inspections are not required where snow cover or frozen conditions exist over the entire site for an extended period and melting conditions do not exist.

9.1 RECORDKEEPING (9.7, 9.10)

Records of inspections and maintenance will be maintained on-site at the Facility and will be made available to the DEQ and the BLM upon request. **Attachment E** includes the inspection report, amendment log, stabilization log, corrective action log, and inspection log that will be used to record inspections for the Facility. All documentation related to inspections and maintenance will be retained for a minimum of three years after the permit is terminated.

[1] Data from the Rawlins Municipal National Weather Service Reporting Station can be obtained from: http://forecast.weather.gov

Following each inspection, the inspector will complete and sign the applicable documentation in **Attachment E**. If the Facility is not found to be in compliance, the inspector will create a record of the corrective actions taken and any subsequent amendments to the SWPPP. If the Facility is found to be in compliance, the legally responsible person or their designee will sign a certification that the site is in compliance with the SWPPP and the permit.

10.0 STABILIZATION AND TERMINATION

Final stabilization will be completed prior to submittal of the Notice of Termination form (Attachment I). Once final stabilization is achieved, the Notice of Termination will be completed and submitted to the Wyoming DEQ.

Final stabilization has occurred when soil disturbing activity is completed and pervious areas and areas not otherwise stabilized with non-vegetative cover are established with perennial vegetative cover with a density of 70% of natural background cover (Attachment K).

11.0 REFERENCES

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12.0 CERTIFICATION (8.2.7)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. In addition, I certify that I am aware of the terms and conditions of the large construction general permit and I agree to comply with those requirements.

Printed Name Title

Signature Date Telephone

Attachment A

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____
construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Section 10.7 of the WYR10-0000 Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" and "qualified person" as defined in Section 10.7 and 9.4 respectively in the CGP.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Department of Environmental Quality

To protect, conserve, and enhance the Quality of Wyoming's environment for the benefit of current and future generations

Matt Mead, Governor

John Corra, Director

General Permit to Discharge Storm Water Associated with *Large Construction Activity* Under the Wyoming Pollutant Discharge Elimination System (WYPDES)

In compliance with the provisions of Chapter 2 of the Wyoming Water Quality Rules and Regulations, the federal Water Pollution Control Act and the Wyoming Environmental Quality Act, facilities located within the State of Wyoming (except areas within the Wind River Indian Reservation where the state does not have jurisdiction) which are or may discharge storm water associated with large construction activities, are hereby authorized to discharge to surface waters of the State of Wyoming upon compliance with the requirements of this permit.

This general WYPDES permit WYR10-0000 is issued under the provisions of Wyoming Water Quality Rules and Regulations Chapter 2.

This permit shall become effective when signed by the Administrator and Director on and expire on March 15, 2016.

Discharges are authorized under this permit only after submission of a Notice of Intent to, and receipt of a Letter of Authorization, from the Department of Environmental Quality/Water Quality Division. See Part 3 of the permit for additional information.

John F. Wagner
Administrator - Water Quality Division

5/9/11
Date

John V. Corra
Director - Department of Environmental Quality

5/9/11
Date

Herschler Building - 122 West 25th Street - Cheyenne, WY 82002 - http://deq.state.wy.us

ADMIN/OUTREACH	ABANDONED MINES	AIR QUALITY	INDUSTRIAL SITING	LAND QUALITY	SOLID & HAZ WASTE	WATER QUALITY
(307) 777-7758	(307) 777-6145	(307) 777-7391	(307) 777-7369	(307) 777-7756	(307) 777-7752	(307) 777-7781
FAX 777-3610	FAX 7776462	FAX 777-6937	FAX 777-6937	FAX 777-5864	FAX 777-5973	FAX 777-5973

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1.3.4 The placement of fill into waters of the state requiring local, state or federal authorizations (such as a federal Section 404 permit from the US Army Corps of Engineers).

1.3.5 Post-construction discharges from industrial activity that originate from the site after construction activities have been completed at the site. Post-construction industrial storm water discharges may need to be covered by a separate storm water permit.

1.3.6 Discharges to waters for which there is a total maximum daily load (TMDL) allocation for sediment, suspended solids or turbidity are not covered unless the applicant develops a SWPPP that is consistent with the assumptions, allocations and requirements in the approved TMDL. Information about TMDL allocations may be found at the following website: http://deq.state.wy.us/wqd/watershed/index.asp.

1.3.7 Storm water discharges that the Department determines will cause, or have the reasonable potential to cause or contribute to, violations of water quality standards or impairments of water quality.

Part 2 Definitions

2.1 **"Access Roads"** means private roads which are exclusively or primarily dedicated for use by the permittee.

2.2 "**Administrator**" means the Administrator of the Water Quality Division, Wyoming Department of Environmental Quality or his agent.

2.3 "**Best Management Practices**" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and/or other management practices to prevent or reduce the pollution of waters of the state. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

2.4 **"Common Plan of Development or Sale"** means projects that may occur in multiple locations and/or in multiple phases, but are part of a single, overall plan. Documentation of common plans may include announcements or other documentation (including signs, public notices, hearings, marketing information, drawings, financing records, permit applications, zoning request, maps, etc.) or physical demarcations (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activity will or may occur in the area.

2.5 "**CWA**" means Clean Water Act or the federal Water Pollution Control Act, 33 USC 1251, *et. seq*.

2.6 **"Department"** means the Department of Environmental Quality

2.7 **"Energy Dissipation"** means methods employed at pipe outlets to prevent erosion by dissipating or lowering the energy of the discharge. Examples include, but are not limited to, concrete aprons, riprap, splash pads, and gabions which are designed and installed to prevent erosion.

2.8 **"Finally Stabilized"** means that all soil disturbing activities at the site have been completed, and a uniform perennial vegetative cover with a density of 70% of the typical or native background vegetative cover for the area has been established on all disturbed unpaved areas and areas not covered by permanent structures. Final stabilization using vegetation must be accomplished using plants or seed mixtures of forbs, grasses and/or woody vegetation that are adapted to the conditions of the site.

2.9 "**Large Construction Activity**" means any clearing, grading, or excavation project which will disturb five or more (not necessarily contiguous) surface acres. Large construction activity also includes the disturbance of less than five acres of total land area when that disturbance is part of a larger common plan of development or sale if the larger common plan will ultimately disturb five acres or more. *Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility.*

2.10 **"Operator"** is the company, individual or organization that has day-to-day supervision and control of activities occurring at the construction site and/or the ability to modify project plans and specifications related to the SWPPP. This can be the owner, developer, the general contractor, or, in some cases, the agent of one of these parties. The operator is responsible for ensuring compliance with all conditions of the permit. The operator shall be knowledgeable in all areas necessary to comply with this permit.

2.11 **"Reportable Quantity"** means any spill or release of oil and hazardous substances which enters any water of the state, or releases that are determined to be a threat to enter waters of the state and are a) considered a "hazardous substance," or b) any amount greater than either 10 barrels of any combination of crude oil/petroleum condensate/produced water or 25 gallons of refined crude oil products. Notice of spills meeting this definition should be made to the WDEQ at 307-777-7781. This number is available for reporting 24 hours a day. An online reporting form is also available at http://deq.state.wy.us/out/spills.htm. Refer to this website or Chapter 4 of the WWQRR for more information.

2.12 **"Section 303(d) List or 303(d) List"** means a list of Wyoming's water quality-limited surface waters requiring the development of Total Maximum Daily Loads (TMDLs) to comply with Section 303(d) of the federal Clean Water Act. A copy of the current Integrated 305(b) and 303(d) Report is available on the WQD website at http://deq.state.wy.us/wqd/watershed/index.asp. A link to a map of 303(d) listed waters, waters with approved TMDLs and class 1 waters is available at http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_Storm_Water/stormwater.asp.

2.13 "**Severe Property Damage**" means substantial physical damage to property, damage to treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2.14 **"Spill Prevention Control and Countermeasure Plan (SPCC)"** is a federal requirement (40CFR112) for facilities that store specific amounts of petroleum products. The plan is not a state requirement, but may be referenced as part of the SWPPP when appropriate.

2.15 "**Storm Water**" means storm water runoff, snow melt runoff, and surface runoff and drainage.

2.16 "**Storm Water Associated with Large Construction Activity**" means the discharge of storm water from construction activities, including clearing, grading, and excavating, that result in land disturbance of five or more acres of total land area. Large construction area also includes the disturbance of less than five acres of total land area that is a part of a larger common plan of development or sale if the larger plan will ultimately disturb five acres or more.

2.17 **"Storm water Associated with Industrial Activity"** means storm water discharges from any of the activities defined in Section 6 (g) (ii) of Chapter 2 of the Wyoming Water Quality Rules and Regulations.

2.18 **"Surface Waters of the State"** means all perennial, intermittent and ephemeral defined drainages, lakes, reservoirs, and wetlands which are not man-made retention ponds used for the treatment of municipal, agricultural or industrial waste; and all other bodies of surface water, either public or private which are wholly or partially within the boundaries of the State.

2.19 **"SWPPP"** means Storm Water Pollution Prevention Plan.

2.20 **"Temporary Stabilization"** means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Surface roughening may also be considered a temporary stabilization method. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent "final stabilization."

2.21 **"Total Maximum Daily Load (TMDL)"** means the maximum amount of a specific pollutant that can be assimilated by a surface water without causing an impairment of designated uses or violating water quality standards. The allowable amount takes into account all sources of that pollutant in a watershed, including point sources and non-point sources, and requires a portion to be set aside as a margin of safety.

2.22 "**Wyoming Surface Water Quality Standards**" refers to Wyoming Water Quality Rules and Regulations, Chapter 1 (surface water standards).

2.23 **"Wyoming Pollutant Discharge Elimination System (WYPDES)"** means the state program for issuing, modifying and reissuing, terminating, monitoring and enforcing permits for discharging pollutants into surface waters of the state under the provisions of the Wyoming Water Quality Rules and Regulations, Chapter 2; W.S. 35-11-101 through 35-11-1803 and the federal Clean Water Act.

Part 3 Obtaining Authorization to Discharge – Notice of Intent (NOI)

3.1 Who must apply. Operators of any large construction activity as defined in Part 2.9. Failure to obtain appropriate coverage may result in an enforcement action.

3.2 Deadline to apply. Except as authorized in Part 3.3 of this permit, an operator seeking authorization under this permit shall submit a completed Notice of Intent (NOI), on a form provided by the Administrator, to the Department at least 30 days prior to commencing construction activities. The NOI may be found on the program website at http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_Storm_Water/stormwater.asp or by calling the Division at 307-777-7781.

3.3 Expedited processing. With just cause, and at the request of the operator, the Administrator may:

3.3.1 Allow the operator of a large construction activity to submit a NOI to the Administrator no later than 10 days prior to commencing construction activities; and
3.3.2 Notify the applicant of the approval or disapproval of coverage under this permit within 10 days of receipt of the NOI.
3.3.3 NOIs where the attached SWPPP contains designs for sediment ponds or basins (as discussed in Part 7) are not eligible for expedited processing.

3.4 Requirement to submit an NOI and SWPPP.

3.4.1 An NOI and SWPPP must be submitted to Department and *coverage under this permit must be authorized in writing prior to the start of soil disturbing activities*.
3.4.2 NOIs that are incomplete will not be processed and will be returned. If an incomplete SWPPP is submitted, both the NOI and SWPPP will be returned and the NOI will not be processed.

3.5 NOI contents. The NOI shall include the following information, at a minimum:

3.5.1 Permittee: The name of the company, entity, or individual seeking permit coverage and contact information for the legally responsible person as defined in Part 10.7.1;
3.5.2 Local Contact: The name, title and contact information for a person who is familiar with the facility operation and who will be the primary contact for WDEQ for questions about facility operations, scheduling inspections and permit compliance.
3.5.3 Fee contact: The person (and contact information) who will receive the annual permit fee invoice and be the point of contact for questions related to billing.
3.5.4 The facility name, location, telephone number and WYDOT project number, if applicable;
3.5.5 Location of the covered facility expressed as quarter/quarter, section, township and range or street address;
3.5.6 Location of the covered facility expressed as latitude and longitude to the nearest 15 seconds;
3.5.7 Estimated project start and completion dates;
3.5.8 Estimated acres of disturbance;

3.5.9 Estimated acreage for the larger "common plan of development or sale" as defined in Part 2.4, if applicable.

3.5.10 Names of receiving waters and, if applicable, note if discharge will be to a municipal storm sewer and for which municipality. Include unnamed drainages in this description;

3.5.11 Identify any water bodies that are listed on the state's 303(d) report as impaired due to sediment, suspended solids or turbidity or have an approved TMDL for sediment, suspended solids or turbidity that:

3.5.11.1 are within 2000 feet the construction site and that may receive runoff from the construction site or;

3.5.11.2 will receive construction site storm water discharges that enter a storm sewer system regardless of the distance from the receiving water. For this paragraph, storm sewer systems are considered to be piped systems that are typical in developed areas.

The state's most recent 303(d) list can be found in the current Integrated 305(b) and 303(d) Report. The report can be found on the WQD Watershed Management website under Water Quality Assessment at: http://deq.state.wy.us/wqd/watershed/index.asp. Approved TMDLs can be found on the same webpage under TMDL Coordination.

3.5.12 Note if a sediment basin or pond, as described in Part 7, will be used on the construction site and described in the SWPPP as required in Part 8.

3.5.13 A description of the activities conducted by the applicant which require it to obtain coverage under this permit;

3.5.14 Delegation of signature authority for reports: The NOI provides a section to designate specific individuals or positions as "duly authorized representatives" with signing authority for reports required under this permit. *This authority does not extend to Notices of Intent (NOIs), Notices of Transfer and Acceptance (NOTAs) or Notices of Termination (NOTs). Signatures for these documents must be in accordance with Part 10.7.1 of this permit.* Designation of "duly authorized representatives" may also be made by letter to the WQD as described in Part 10.7.2.

3.5.15 A complete SWPPP for the project to be covered under this permit.

3.5.15.1 WQD encourages electronic submission of SWPPPs. SWPPPs that are submitted in electronic format must be in PDF or in a format compatible with the most recent version of Microsoft Word. Electronic versions of maps or diagrams must be submitted in PDF or JPG formats. Other electronic formats may be acceptable with the agreement of the Administrator. Electronic SWPPPs may be submitted on CD or DVD with the NOI or by e-mail to *deq-stormwater@wyo.gov*. SWPPPs submitted by e-mail must include the permittee name and contact information and the project name and location.

3.5.15.2 Hardcopies of SWPPPs are acceptable and, if submitted, must accompany the NOI.

3.5.15.3 Issuance of a Letter of Authorization under this permit does not imply that the WDEQ has "approved" the applicant's SWPPP. It is the responsibility of the permittee to ensure the effectiveness of their

SWPPP through appropriate BMP design, selection, inspection and maintenance.

3.5.16 Name and signature of a legally responsible person as defined in Part 10.7.1.

3.6 Agreement to comply. Submission of the NOI to the Department constitutes full agreement by the operator to meet and comply with all requirements of this general permit.

3.7 Projects that may discharge to class 1 waters. Large construction activities that have the potential to discharge to Class 1 waters (see Appendix A for a list of Class 1 waters) may be subject to a site visit by Department personnel prior to issuing coverage under this general permit. Site visits are weather-dependent and may delay coverage under this permit. For example, site visits will not typically be scheduled to areas with heavy snow cover and a visit may not always be possible within 30 days of an NOI and SWPPP submittal. Applicants should plan accordingly.

3.8 Denial of coverage. Except as noted in Parts 3.3 and 3.7, the Administrator shall notify the applicant of the approval or disapproval of coverage under this permit within 30 days of receipt of the NOI. In the case of disapproval, the Administrator shall specify in writing the reason(s) for the disapproval and action(s), if any, that the applicant can take to gain approval.

3.9 Individual permit required. If, after evaluation of the NOI and any additional information requested for the evaluation, it is found that this general permit is not applicable to the operation, the application will be processed as an application for an individual permit. The applicant will be notified of the Administrator's decision to deny authorization under the general permit and require coverage under an individual permit. Additional information may be required and a minimum of 120 days will be required to process the individual application and issue the permit.

3.10 Temporary coverage. The Administrator reserves the right to issue temporary coverage under this general permit to cover storm water discharges from projects required to obtain coverage under an individual permit.

3.11 Continuation of coverage under a renewed permit

3.11.1 *Temporary automatic coverage.* Storm water discharges associated with large construction activities that have active coverage under the previous general storm water permit for construction (issued in 2006 and expiring March 15, 2011) are automatically covered under this permit until **August 9, 2011.**

3.11.2 *Deadline to renew.* All permittees that receive coverage under this automatic process must submit an NOI, or other form as provided by the Administrator, to this office **by July 9, 2011 to maintain coverage under this general permit**. Operators who fail to do so will have their coverage under this permit terminated. Construction sites that are not "finally stabilized," and where coverage lapses, may be subject to an enforcement action.

Part 4 Transfer of Permit Coverage for an Entire Project or a Portion of a Project – Notice of transfer and acceptance (NOTA).

4.1 When operational control over an entire project or a portion of a project (e.g., the sale of certain lots within a residential, commercial or industrial development to other parties) changes to another operator, the current permittee must transfer permit coverage for those areas to the new operator.

4.2 A Notice of Transfer and Acceptance (NOTA) must be submitted to the WQD within 14 days of the transfer of operational control. Late submittals will not be rejected; however, the Department reserves the right to take enforcement for any unpermitted discharges or permit noncompliance. The NOTA must be completed and signed by both parties. An NOTA form is available on the WDEQ storm water web site at: http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_Storm_Water/stormwater.asp or a paper copy may be obtained by calling 307-777-7781.

4.3 Upon processing a complete NOTA, the WQD will provide the new operator a letter of authorization under this permit. In the case of a partial transfer, the new operator will be assigned a new authorization number. In both cases, the relinquishing party is also notified when the transfer is complete. If notice of a transfer is not received, then both parties should follow up with storm water program staff.

4.4 If requested by the Administrator, an NOI shall be submitted by the new permittee and an NOT shall be submitted by the current permittee.

4.5 The permittee relinquishing coverage shall provide the new permittee with copies of the site SWPPP and inspection and maintenance records that are kept in accordance with Part 9.7. For inspection and maintenance records, only the most recent twelve months' records need be provided to the new permittee.

4.6 Updates to the facility SWPPP

4.6.1 The new operator may develop and implement a new SWPPP for their portion of the project that meets all the terms and conditions of this permit, or

4.6.2 The new operator may adopt and continue to implement the original SWPPP provided it is adequate and relevant for the new activities that will occur onsite.

4.6.3 With either option, the permittee shall ensure, either directly or through coordination with other operators that their SWPPP meets all terms and conditions of this permit and their activities do not interfere with another operator's erosion and sediment control practices.

4.6.4 Changes related to the transfer must be made to the SWPPP within 30 days of transfer of operational control. These changes include, at a minimum, changes in personnel responsible for implementing the SWPPP.

4.6.5 The new operator must comply with all conditions in this permit and with all provisions of the existing SWPPP until such time as the existing SWPPP is amended or replaced by a new SWPPP.

Part 5 Notice of Termination (NOT)

5.1 Permittees wishing to terminate coverage under this permit must submit a Notice of Termination (NOT) identifying the facility and the reason permit coverage is no longer required. The NOT shall be signed in accordance with Part 10.7.1.

5.2 Compliance with the conditions of this permit is required until an NOT has been submitted and accepted by the Department.

5.3 Failure to submit an NOT shall result in continued accrual of annual permit fees until such time that an NOT is received and accepted by the WQD.

5.4 An NOT may only be submitted when one of the following conditions has been met:

5.4.1 Final stabilization (see Part 2.8 for definition) has been achieved on all parts of the site for which the permittee is responsible and all temporary synthetic and structural erosion and sediment controls (e.g., silt fence, temporary rock check dams) have been removed.

5.4.2 For individual lots in residential construction only:

5.4.2.1 Final stabilization has been achieved as defined in Part 2.8 or

5.4.2.2 Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner. Additionally, the permittee shall provide a copy of a "Homeowner Factsheet" to the homeowner to inform the owner of the need for, and the benefits of, erosion and sediment control and final stabilization. A PDF version of the "Homeowner Factsheet" may be found on the DEQ web site at http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_Storm_Water/stormwater.asp.

5.4.3 Final stabilization for producing oil and gas facilities does not require revegetation in the area within permanently installed well anchor points, the travel surface of a site access road, and areas within established fire walls surrounding tank batteries. All other areas must be revegetated or covered by permanent materials (paving, gravel, etc.) to be considered finally stabilized. Surfaces left unpaved must be designed and prepared in a manner that will prevent ongoing erosion problems. The permittee may be required to re-extend coverage under this permit to areas with erosion problems.

Part 6 Fees

All WYPDES general permit authorizations are subject to a $100 annual permit fee for as long as the authorization is active. The annual billing cycle is based on the calendar year from January 1 to December 31. See the Wyoming Environmental Quality Act W.S. 35-11-312 for further information.

6.1 General. All parties who have held an authorization under this permit for any part of a calendar year will be billed $100 per authorization held. The fee is not prorated for part year ownership.

6.2 Fees when an authorization is transferred. When an authorization is transferred all parties who held the authorization in the calendar year will receive invoices for $100. The fee is not prorated for part-year ownership.

6.3 Fee accrual. Fees will continue to accrue until:
- 6.3.1 The WQD has received a Notice of Termination meeting the requirements of Part 5 or;
- 6.3.2 The authorization is transferred to another party as specified in Part 4.
- 6.3.3 In the event a general permit is "continued" beyond its expiration date, fees will continue to accrue during the "continuation." All authorizations remain active under a continued permit until it is replaced by another permit.

Part 7 Effluent Limits

7.1 Quality of discharge. Storm water discharges associated with construction activities shall not cause pollution, contamination or degradation to waters of the state.
- 7.1.1 Those best management practices (BMPs) or other control measures specified in the SWPPP shall ensure that the storm water discharges do not cause a violation of Wyoming Water Quality Standards.
- 7.1.2 The quality of permitted storm water discharges shall reflect the best which is attainable through the proper implementation of all items in the facility SWPPP.

7.2 Best management practice selection, installation and maintenance. All BMPs must be properly selected, installed and maintained in accordance with the manufacturer's specifications and good engineering, hydrologic and pollution control practices. (It is not required that the SWPPP be prepared or certified by a registered engineer.) If periodic inspections or other information indicates a practice has been used inappropriately or incorrectly the permittee must modify or replace the control.

7.3 Erosion and sediment controls. Design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, such controls must be designed, installed and maintained to:
- 7.3.1 Control storm water volume and velocity within the site to minimize soil erosion;
- 7.3.2 Control storm water discharges, including both peak flow rates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion;
- 7.3.3 Minimize the amount of soil exposed during construction activity;
- 7.3.4 Minimize the disturbance of steep slopes;
- 7.3.5 Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
- 7.3.6 Provide and maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible; and
- 7.3.7 Minimize soil compaction and, unless infeasible, preserve topsoil.

7.4 Visible or measurable erosion. Visible or measurable erosion, associated with a construction activity, which leaves the construction site as a result of inadequate or ineffective SWPPP design or maintenance of BMPs is prohibited. Visible or measurable erosion is defined as:

7.4.1 Deposits of mud, dirt, sediment, or similar material exceeding one cubic foot volume in any area of 100 square feet or less on public or private roads, adjacent property, or into waters of the state by deliberate actions or as a result of water or wind erosion; or

7.4.2 Evidence of concentrated flows of water over bare soils (such as rills or gullies), turbid or sediment-laden flows, or evidence of on-site erosion on bare slopes, where runoff of water is not filtered, treated, or captured on the site using BMPs specified in the SWPPP; or

7.4.3 Earth slides, mud flows, earth sloughing, or other earth movement which leaves the construction site.

7.5 Recovery of offsite sediment. Off-site accumulations of sediment (except tracking onto paved roads) must be removed in a manner and at a frequency sufficient to minimize off-site impacts. *[See Part 7.7 for addressing offsite tracking onto paved roads.]*

7.5.1 Where a determination is made that sediment must be removed to prevent deposition within surface waters (or conduits to surface waters, such as storm drain systems), then it must be removed within 7 days of the determination or before the next precipitation event whichever is sooner.

7.5.2 Operators of projects in remote, rural sites that do not have “all season” road access may delay sediment removal until site conditions are appropriate for access. The reason for such a delay must be documented in the SWPPP.

7.5.3 Sediment removal may also be delayed where there is access to the area, but field conditions are too wet or muddy to work without causing damage to the area. If necessary to prevent discharge of sediment to surface waters or storm drain systems, and if practicable, the permittee should install additional sedimentation controls to contain the sediment until it can be removed. Actions taken under this paragraph should be documented in the SWPPP.

7.5.4 In certain situations where removing sediment from an area will likely result in greater sediment discharges than if it is permanently stabilized in place (e.g., sediment dispersed in a vegetated riparian area), then it may be advisable to seed or otherwise stabilize that area rather than remove the deposit. Such stabilization must be acceptable to the landowner or manager and be accomplished as soon as practicable and documented in the SWPPP.

7.5.5 Under no conditions shall the sediment be washed into municipal storm sewers or surface waters of the state.

7.6 Inlet protection. All storm drain inlets in the immediate vicinity of the construction site must be protected by appropriate BMPs during construction until all sources with the potential for discharging to the inlet have been stabilized. This includes storm drain inlets which may be affected by sediment tracked onto paved surfaces by vehicles or equipment.

Inlet protection BMPs are a last line of control – sediment and erosion control practices must be used on site. Inlet protection devices must conform to local ordinances or regulations. In general, inlet protection needs to provide for drainage adequate to prevent

excessive roadway flooding. As such, inlet protection does not necessarily require installation of devices on or in the inlet. BMPs in the gutter may also be considered.

Inlet protection maybe removed for a particular area if a specific concern (i.e., local flooding/freezing, snow removal, traffic hazard) has been identified and documented in the SWPPP. In this situation, additional erosion and sediment control practices must be used to compensate for the loss of the inlet protection device to prevent sediment from entering the storm sewer system.

Maintenance and cleaning of inlet protection devices, including on-site sediment and erosion controls, must be performed in accordance with Appendix C.

7.7 Off-site tracking of sediment. Vehicle tracking of sediment from the construction site to paved areas (either within or outside of the construction boundaries) must be minimized by BMPs. This may include having a designated egress with appropriate surfacing from the site, or by designating off-site parking. The permittee is responsible for (or making the arrangements for) street sweeping and/or scraping if BMPs are not adequate to prevent sediment from being tracked onto the street from the site. Accumulations of tracked and deposited sediment must be removed from paved surfaces within 24 hours or, if applicable, within a shorter time if specified by local authorities or the Department.

7.8 Use of sediment ponds or basins. The permittee is encouraged, but not required, to install temporary sediment ponds or basins where appropriate in areas where 10 or more acres of disturbed area drain to a common location prior to the runoff leaving the site or entering surface waters of the state. Permittees are also encouraged to use sediment basins or ponds for smaller areas with steep slopes or highly erodible soils even if less than ten acres drains to one area.

7.9 Design of sediment ponds. For purposes of this permit, sediment ponds are those ponds that are large enough to treat and control all runoff from a 10-year, 24-hour or larger precipitation event or that have storage capacity in excess of two acre-feet. Sediment ponds must be designed, constructed and operated in accordance with the requirements found in the WWQRR Chapter 11, Section 31. All design plans and calculations for sediment ponds must be included with the SWPPP at the time of application. Sediment pond designs must be stamped by a Wyoming-licensed, professional engineer (PE). SWPPPs will not be considered complete where sediment pond plans do not meet the requirements of WWQRR Chapter 11, Section 31 and will result in the applicant's NOI and SWPPP being returned to the applicant.

7.10 Design of sediment basins. Sediment basins are smaller than sediment ponds. If used, basins must provide at least the following:

7.10.1 The basins shall be sized to provide 3,600 cubic feet of runoff storage below the outlet pipe per acre drained to the basin and an additional 900 cubic feet per acre drained for sediment storage. Alternative designs may be used which provide storage below the outlet for a calculated volume of runoff from a 2-year, 24-hour storm and provides not less than 1800 cubic feet of runoff storage below the outlet

pipe from each acre drained to the basin and an additional 900 cubic feet per acre drained for sediment storage.

7.10.2 Basin outlets must be designed to avoid short-circuiting and the discharge of floating debris.

7.10.3 The basin must be designed with the ability to allow complete basin drawdown for maintenance activities. Additionally, the basin should be designed to release sufficient storage volume in a 72 hour period to re-establish the basin's working pool.

7.10.4 The basin must have a stabilized emergency overflow to prevent failure of basin integrity.

7.10.5 All design plans and calculations for sediment basins must be included with the SWPPP at the time of application. When sediment basins are constructed to a standard design provided by the WQD plans will not need to be stamped by a Wyoming-licensed, professional engineer. Basins where the design deviates from the standard plan must have plans and calculations that are stamped by a Wyoming PE.

7.11 Discharge from ponds or basins. When discharging from basins, ponds or other impoundments, utilize outlet structures that withdraw water from near the surface (withdrawal within 3 to 6 inches below the surface is preferred), unless infeasible. Alternative discharge methods, if needed, should not draw off sediment and should minimize discharge turbidity. Energy dissipation must be provided for the outlet.

7.12 Maintenance of ponds or basins. Maintenance shall, at a minimum, conform with the general guidelines found in Appendix C.

7.13 Construction site dewatering. Pumped discharges from construction sites covered under this permit are limited to storm water and minor amounts of ground water. A separate permit must be obtained for the discharge of water from other sources, including ground water. Where there is sufficient ground water present such that it must be pumped from the construction site, those discharges do not meet the definition of minor amounts of ground water and must be covered under a separate WYPDES permit specifically for those discharges.

7.13.1 The permittee must operate the discharge to minimize the release of sediment.

7.13.2 Pumped water that may be turbid or sediment laden must be treated with appropriate BMPs, such that the discharge does not:

7.13.2.1 Cause a violation of water quality standards as defined in Chapter 1 of the Wyoming Water Quality Rules and Regulations.

7.13.2.2 Adversely affect downstream landowners.

7.13.2.3 Cause erosion or scouring at the outlet or in the receiving water.

7.13.3 The discharge must be dispersed over appropriate energy dissipation devices such as rock riprap, sand bags, plastic sheeting, or equivalent.

7.13.4 Significant ground water. ***The general rule of thumb for determining what ground water is non-significant is as follows:*** If an operator is able to work

in a trench or excavation without dewatering during dry weather and only needs to dewater because of a rain or snow melt event, then the ground water can be considered non-significant. If an operator is finding they must dewater even though there has been no precipitation, then a WYPDES wastewater permit (temporary or individual) is required. Any operator who is unsure of whether or not his ground water is non-significant should secure separate coverage under the WYPDES general permit for temporary discharges or an individual wastewater permit for the dewatering operation.

7.14 Soil stabilization.

7.14.1 Final or temporary stabilization of disturbed areas must, at a minimum, be initiated immediately whenever any clearing, grading, excavating or other earth disturbing activities have permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Operators are not required to initiate stabilization measures in areas of a project that are essential for site access or work activities (such as pipeline assembly and installation) until those areas are no longer needed for ongoing access or work.

7.14.2 Temporary stabilization may be used whenever construction activities are expected to resume in the area to be stabilized or when weather or other conditions are not appropriate for initiation of permanent stabilization.

7.14.3 Areas to be protected include graded slopes, ditches, berms and soil stockpiles and all other disturbed areas with potential to contribute sediment to runoff that will leave the construction site.

7.14.4 Temporary stabilization includes practices such as cover crop planting, installation of rolled erosion products, mulching (provided the mulch is protected from wind such as crimping straw mulch into the soil) or surface roughening (such as by plowing to achieve a rough, cloddy surface). Practices that provide equivalent erosion protection may be used.

7.14.5 Where initiation of stabilization is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practicable.

7.15 Pollution prevention measures. Design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:

7.15.1 Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge Wash waters discharged under this permit may not contain soaps, detergents or solvents;

7.15.2 Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to storm water;

7.15.3 Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures; and

7.15.4 Bulk storage for petroleum products and other chemicals shall have adequate protection so as to contain all spills and prevent any spilled materials from entering waters of the state or municipal storm sewer systems.

7.16 Minimum storm size for BMPs. Storm water best management practices are expected to withstand and function properly during precipitation events up to a 2-year, 24-hour storm event. Visible and measurable erosion (see Part 7.4) that leaves the construction site from such storm events should be minimal. The 2-year, 24-hour storm event in Wyoming ranges from 0.8 to 2.6 inches. An isopluvial map of the 2-year, 24-hour storm depth is available on the DEQ storm water website. Permittees may substitute equivalent data published by the local municipality or regulatory agency.

7.17 Allowable discharges. All discharges covered by this permit shall be composed entirely of storm water associated with construction activity. Discharges which include material other than storm water associated with construction activity must be in compliance with a WYPDES permit (other than this permit) issued for the discharge.

7.18 Prohibited Discharges. The following discharges are prohibited:
7.18.1 Concrete washout;
7.18.2 Wash waters from stucco, paint, form release oils, curing compounds and other construction materials;
7.18.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and
7.18.4 Soaps or solvents used in vehicle and equipment washing.

7.19 Sanitary facilities. Sanitary sewage facilities (typically portable) will be operated in compliance with all applicable state and local waste disposal, sanitary sewer, or septic system regulations. Portable toilets must be properly secured to prevent tipping by vandals or blowing over in wind events.

7.20 Construction project identification. A copy of the authorization letter shall be posted at the construction site in a prominent and safe place for public viewing during regular business hours. When posting is not practical, the letter of authorization shall be made available to representatives of the state as well as federal and local officials when requested.

7.21 Requirements of other agencies. All storm water discharges must comply with erosion control or other requirements, policies, or guidelines of other local, state or federal agencies.

Part 8 Storm Water Pollution Prevention Plan

8.1 General requirements

8.1.1 Scope of SWPPP. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed for all construction activities covered under this permit. For construction projects where construction of planned, future phases is speculative, those areas may be added to the SWPPP when construction becomes certain – prior to any earth disturbance occurs. The SWPPP shall be prepared in accordance with good engineering, hydrologic and pollution control practices. (It is not required that the SWPPP be prepared by a registered engineer.)

8.1.2 Joint SWPPPs. The SWPPP may be prepared as a joint document that identifies more than one permittee and may specify the responsibilities of each permittee by

task, area and/or timing. In the event there is a requirement in the SWPPP for which responsibility is not clearly defined each permittee shall be responsible for implementation of that requirement. Each permittee is also responsible for ensuring that its activities do not render another permittee's best management practices (BMPs) ineffective. Where the SWPPP is a joint document, it must be certified and signed by all participating permittees in accordance with Part 10.7.

8.1.3 Pollutant source identification. The SWPPP shall:

8.1.3.1 Identify all potential sources for pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction activity from the facility. At a minimum, each of the following sources and activities shall be evaluated for the potential to contribute pollutants to storm water discharges and identified in the SWPPP if found to have such potential:

a. All disturbed and stored soils, aggregate and fill material;
b. Tracking of sediment onto paved areas by vehicles;
c. Management of contaminated soils;
d. Loading and unloading operations;
e. Outdoor storage of materials such as building materials, fertilizers, chemicals, etc.;
f. Vehicle fueling and maintenance;
g. Significant particle or dust generation;
h. Routine maintenance activities involving fuels, oils, solvents, detergents, fertilizers or other chemical;
i. On-site waste management practices (waste piles, liquid wastes, dumpsters, etc.);
j. Concrete truck/equipment washing;
k. Dedicated asphalt and concrete batch plants;
l. Non-industrial waste sources such as worker trash and portable toilets; and
m. Other areas or procedures where potential spills can occur.

8.1.3.2 Describe the specific best management practices (BMPs) to be used to reduce pollutants in storm water discharges associated with construction activity at the facility

8.1.3.3 Ensure the practices shall be selected and described in accordance with good engineering, hydrologic and pollution control practices, including the installation, implementation and maintenance requirements

8.1.3.4 Be properly prepared and updated in accordance with Parts 8.2 and 8.1.5 to ensure compliance with the terms and conditions of this permit.

8.1.4 Plan implementation.

8.1.4.1 Permittees must implement the provisions of the SWPPP as written and updated, from commencement of construction activity until final stabilization is achieved.

8.1.4.2 For sites with permit coverage under the previous permit, that expired **March 15, 2011,** the permittee's SWPPP must meet the SWPPP requirements of this permit by **January 1, 2012**. *Permittees shall continue to implement existing SWPPPs developed under the previous permit until the SWPPP has been updated and implemented.*

8.1.5 Plan amendment.

8.1.5.1 The permittee shall modify the plan whenever there is a change in design, construction, operation, or maintenance that changes the potential for the discharge of pollutants to waters of the state.

8.1.5.2 The plan shall also be modified if it proves ineffective in eliminating or minimizing pollutants present in storm water.

8.1.5.3 If the inspections required in Part 9 identify necessary changes to the SWPPP, the SWPPP shall be revised within 30 days following the inspection.

8.1.5.4 Because SWPPPs are expected to be amended regularly, the Administrator or his agent may request any SWPPP be submitted to the department for review. If the Administrator elects to review the SWPPP and finds that it is deficient, the permittee shall modify the plan as directed and within the time specified by the Administrator.

8.1.6 Plan retention.

8.1.6.1 The most current version of the SWPPP and inspection records shall be retained at the construction site during active construction unless infeasible.

8.1.6.2 If keeping a copy of the SWPPP and inspection records on site is infeasible (such as on a site where there is no construction trailer or other structure where the SWPPP can be kept), the permittee shall provide the location of an off-site SWPPP to the WQD either by letter or e-mail. Such notice must include the facility storm water permit authorization number, location of the SWPPP and the name, address and a contact telephone number for a person with access to the SWPPP. The SWPPP must be made available to an inspector or other program staff within 48 hours of a request.

8.1.6.3 The SWPPP and inspection records must be made available to the Administrator, or authorized agent, for review at the time of an onsite inspection.

8.1.7 *Plan availability*. The permittee shall make the SWPPP and specific inspection reports available upon request to the Administrator or his representative; any federal, state or local government officials or to the operator of a municipal separate storm sewer system receiving discharges from the site.

8.1.8 *Guidance.* Many guidance materials for best management practice (BMP) selection and implementation can be found on the internet, including on the DEQ web page at *http://deq.state.wy.us/wqd/WYPDES_Permitting/WYPDES_Storm_Water/stormwater.asp*.

8.2 Content. *At a minimum*, the SWPPP shall include the information required below. SWPPPs that are found to be incomplete shall be in violation of this permit. A SWPPP template has been prepared by WQD staff and can be found on the DEQ storm water website. Permittees are encouraged to use the online template. While permittees are not required to use the online template, **all SWPPPs must conform to the format set forth below**. SWPPPs that do not conform to the format below will be returned and processing of the NOI will be delayed. A hardcopy of the SWPPP template may be requested from the WQD by calling 307-777-7781

8.2.1 SWPPP administrator. Each SWPPP shall identify a specific individual or individuals within the facility organization that are responsible for developing the storm water SWPPP and assisting the facility manager in its implementation, maintenance, and revision. The SWPPP shall clearly identify the responsibility of plan administration, either by name or job title. Identified individuals (whether by name or position) must be knowledgeable and experienced in the application of erosion and sediment control BMPs and the installation, inspection and maintenance of such controls.

8.2.2 Site description - narrative: The SWPPP shall have a narrative description of:

8.2.2.1 The nature of the construction activity.

8.2.2.2 The proposed sequence of major activities and a planned completion date.

8.2.2.3 An estimate of the total area of the site and an estimate of the area expected to undergo clearing, excavation or grading, including off-site borrow areas, access roads, areas for support activities and staging/storage areas.

8.2.2.4 A description of storm water discharges from support activities dedicated to the construction site including, but not limited to, off-site materials borrow areas, concrete or asphalt batch plants, equipment staging yards, material storage areas and access roads constructed for the project.

8.2.2.5 A brief description of the existing vegetation at the site and an estimate of the percent of vegetative ground cover.

8.2.2.6 The location and description of any other potential pollution sources including, but not limited to:

a. vehicle fueling
b. equipment maintenance
c. storage of fertilizers
d. chemicals or paint.

8.2.2.7 The name of the drainage or water body (surface water(s) of the state) that may receive a storm water discharge from the construction activity and the size, type, and location of any outfall.

a. You must note where discharges are to unnamed drainages and provide the name of the first named drainage that will receive that discharge if the first named drainage is within 1000 feet of the discharge.
b. If the discharge is to a municipal separate storm sewer, indicate the name of the municipal owner of that system, the location of

the storm sewer outfall, and the drainage or water body that will receive storm water discharges from the municipal outfall.

8.2.2.8 Identify any water body listed as impaired under section 303(d) of the federal Clean Water Act due to sediment, suspended solids or turbidity or that has an approved TMDL for sediment, suspended solids or turbidity that is within 2000 feet of, and may receive flow from, the permitted construction activity. BMPs in the SWPPP must be consistent with the assumptions, allocations and requirements of the TMDL. The state's most recent 303(d) list can be found in the current Integrated 305(b) and 303(d) Report. The report can be found on the WQD Watershed Management website under Water Quality Assessment at: http://deq.state.wy.us/wqd/watershed/index.asp. Approved TMDLs can be found on the same webpage under TMDL Coordination.

8.2.3 Site maps. One (or more) map(s) should be prepared that provide, at a minimum, the following information. Maps should be prepared so that all of the required information is clearly displayed and it is clear what BMPs will be installed in each major stage of construction, including the time between the cessation of active construction and final stabilization. Provide multiple maps if necessary to clearly describe BMP timing and placement. The scale of the map(s) must be sufficient to identify the location of all items required below.

8.2.3.1 Preconstruction topography and location of surface waters of the state.

8.2.3.2 Construction site boundaries.

8.2.3.3 All areas of soil disturbance and areas that are to remain undisturbed.

8.2.3.4 The location of surface waters of the state as defined in Part 2.18 of this permit. These include springs, streams, wetlands, lakes and any defined drainages that could receive storm water discharge from the construction site.

8.2.3.5 Areas used for storage of building materials, soils, wastes, fuel, and areas used for concrete washout.

8.2.3.6 Locations of all existing or planned temporary or permanent erosion and sedimentation controls.

8.2.3.7 Location of all other structural and non-structural best management practices for pollutants other than sediment, including but not limited to, fueling/maintenance areas and concrete washout disposal areas.

8.2.3.8 Site topography or storm water drainage patterns including lines showing boundaries between different drainage areas in the project area(s).

8.2.3.9 Include areas where dedicated support activities (e.g., operations producing earthen materials such as sand and gravel, staging areas, portable asphalt or concrete batch plants) occur and are to be covered under the same general permit authorization as the construction activity. See Part 1.2.2 for more information on what can be covered under on authorization. Activities covered under another WYPDES storm water authorization (such as a mineral mine with separate coverage) do not need to be included.

8.2.3.10 Storm water discharge locations. Include discharge locations for offsite operations covered under this permit. Also include storm drain inlets where storm water entering the storm drain system may leave the construction site.

8.2.3.11 North arrow. Include a legend where needed for clarity.

8.2.4 Best management practices (BMPs). The plan shall include a narrative description of appropriate controls and measures that will be implemented before, during, and after construction. At a minimum, BMPs in the SWPPP shall conform to the general guidelines found in Appendix C.

The plan shall clearly describe the relationship between the stages of construction and the implementation and maintenance of controls and measures. For example, which controls will be implemented during each of the following stages of construction: clearing and grubbing necessary for perimeter controls, initiation of perimeter controls, remaining clearing and grubbing, road grading, storm drain installation, final grading, stabilization, and removal of control measures.

The description of controls shall address the following minimum components:

8.2.4.1 **EROSION AND SEDIMENT CONTROLS**. An erosion and sediment control plan shall identify appropriate control measures for each major stage of construction.

a. Erosion prevention BMPs. The goal of erosion prevention is preventing soil (or sediment) movement and keeping it at its original location within the construction site. Each SWPPP shall provide best management practices (BMPs) for erosion prevention wherever practical. Examples of BMPs for erosion prevention include, but are not limited to:

- Preserving existing vegetation,
- Scheduling
- Surface roughening
- Permanent or temporary seeding and planting
- Mulches, soil binders or tackifiers, erosion control blankets and mats
- Wind erosion control
- Storm water diversion practices upslope of a construction site
- Pipe slope drains
- Outlet protection

b. Sedimentation control. Sedimentation occurs when soil is eroded and transported from its original location. The goal of sedimentation control is to prevent sediment from leaving the construction site and, more particularly, from entering surface waters of the state or storm drain inlets. Every SWPPP shall describe adequate BMPs to achieve sedimentation control. Examples of BMPs for sedimentation control include, but are not limited to:

- Sediment barriers such as straw bales, gravel berms, silt fences, fiber rolls or wattles.
- Sediment traps and basins
- Storm drain inlet protection
- Entrance/exit tracking controls
- Undercut lots where curb and gutter are installed
- Vegetated buffer strips
- Grassed waterways
- Water bars and water wings

c. Stabilization measures. The SWPPP shall describe temporary or permanent stabilization measures (such as cover crop plantings, mulching or erosion control blankets, surface roughening, etc.) for exposed soil areas where activities have permanently or temporarily ceased. Refer to Part 7.14 for additional information on stabilization requirements and timing.

8.2.4.2 **CONSTRUCTION SITE DEWATERING.** The SWPPP must specify BMPs for discharges from construction site dewatering. Discharges must meet the conditions specified in Part 7.13 including the use of settling or filtration techniques as appropriate and the use of velocity dissipation devices at the outlet.

8.2.4.3 **OPERATIONAL CONTROLS.** The plan shall describe best management practices (BMPs) used in day-to-day operations on the project site that reduce the contribution of pollutants in storm water runoff.

a. Good housekeeping BMPs to maintain a clean and orderly facility. At a minimum, the SWPPP shall address litter, debris, chemicals, fertilizers and sanitary wastes. This includes measures to remove sediment that has left the construction site.

b. Bulk storage of petroleum products. Except as described in paragraph 5 below, the SWPPP shall describe specific practices for the bulk storage of petroleum products. Construction sites that are covered by, and in compliance with, other rules or regulations that address petroleum storage and spill response, such as the federal Spill Prevention Control and Countermeasure (SPCC) rule may follow those requirements as longs as their plans are available for WDEQ storm water inspection.

1. The SWPPP shall describe appropriate practices for addressing a spill, including methods of handling and disposing spilled products and contaminated soils.
2. Secondary containment (or a BMP that provides equivalent protection) must be used where a spill has the potential to enter a surface water of the state or a storm sewer system.

3. Secondary containment shall be able to hold the volume of the largest container, plus 10%, for a minimum of 72 hours.
4. The SWPPP shall contain information on reporting spills to appropriate project supervisors and, where the spill is a "reportable quantity," for reporting to the WDEQ. See Part 2.11 for information on reporting spills to WDEQ.
5. The facility spill prevention control and countermeasures (SPCC) plan (or other relevant plans) may be referenced in the SWPPP as fulfillment of this requirement and must be readily available for inspection.

c. The SWPPP must provide for specific practices that will protect surface waters and storm drains from discharge of concrete washout, grindings and/or slurry. Concrete wash waters, grindings or slurry shall not enter surface waters of the state or storm drains.

d. The SWPPP shall describe appropriate BMPs to control storm water pollution from portable concrete or asphalt batch plants covered under this permit.

e. The SWPPP shall describe employee training to inform personnel of their responsibility in implementing the practices and controls included in the SWPPP such as spill response, good housekeeping and sediment control. Employee training must be provided at least annually, as new employees are hired or as necessary to ensure compliance with the SWPPP and general permit.

8.2.5 *Maintenance***.** All practices identified in the SWPPP must be maintained in effective operating condition.

8.2.5.1 The plan must indicate, as appropriate, the intervals or conditions upon which BMPs shall be maintained.

8.2.5.2 BMPs found to be in need of repair or maintenance shall be repaired or maintained in accordance with Appendix C, Part 2. Repair/ maintenance activities shall be documented and maintained in accordance with Part 9.7.

8.2.6 *Inspections.* The plan must describe an inspection program and schedule that meets the requirements of Part 9.

8.2.7 *Signature.* All SWPPPs must be certified and signed in accordance with Part 10.7 of this permit.

Part 9 Self Monitoring and Inspection Requirements

9.1 Site inspections. The permittee shall provide qualified personnel to conduct inspections as required in this section.

9.2 Inspection schedules.

9.2.1 *Active construction sites*. During active construction inspections must be conducted in accordance with one of the two schedules listed below. You must specify in your SWPPP which inspection schedule you will use.

9.2.1.1 During active construction, qualified personnel shall inspect at least once every 14 calendar days **and** within 24 hours of any precipitation and/or snow melt event which exceeds 0.5 inches. The permittee shall have the option of maintaining a rain gauge at their site or using the nearest National Weather Service precipitation gauge station. Any rain measurement shall be taken from an area within 10 miles of the construction project, OR

9.2.1.2 At least once every seven days.

9.2.2 *Inactive construction sites*. The frequency of inspections may be reduced to once every 30 days (or as allowed under an approved alternative inspection schedule, see Part 9.5) after the permittee has completed earthwork and construction activities at the construction site and has installed BMPs as specified in the SWPPP. All areas to be inspected monthly must have initiated temporary or permanent stabilization measures as required in Part 7.14.

9.2.3 *Weather-related delays.* Operators of projects in remote, rural sites that do not have "all season" road access may delay inspections until site conditions are appropriate for access. The reason for such a delay must be documented in the SWPPP. Inspections must occur as soon as access is feasible.

9.3 Scope of inspections. Inspections shall cover all permitted areas except as may be modified under Part 9.5. At a minimum, inspections must include the following:

9.3.1 The construction site perimeter
9.3.2 Material and/or waste storage areas that are exposed to precipitation
9.3.3 Areas where storm water discharges from the site
9.3.4 Areas where vehicles leave the construction site
9.3.4 Areas where vehicle maintenance occurs
9.3.5 All site BMPs

9.4 Qualified person. A qualified person is one who is familiar with the requirements of the SWPPP and permit conditions. A qualified person must be knowledgeable and experienced in the application of erosion and sediment control BMPs and the installation, inspection and maintenance of such controls, as well as, any non-sediment control BMPs identified in the project SWPPP.

9.5 Alternative inspection plans and schedules. A permittee may submit an alternative inspection plan for long, narrow, linear construction projects such as pipeline or utility line installation, and other projects in remote areas where vehicle traffic is restricted or could compromise native vegetation or stabilization measures. A copy of the SWPPP and alternative inspection plan must be submitted to the Department at least 30 days prior to implementing the plan. An alternative plan must provide for the timely recognition and repair of erosion or sedimentation. For an alternative inspection plan to be valid, it must be approved in writing by WQD.

9.5.1 Alternative inspection plans approved under the previous permit are considered valid under this permit.
9.5.2 Alternative inspection plans are considered part of the SWPPP and transfer to a new operator with the SWPPP when a project is transferred.
9.5.3 WDEQ may review any alternative inspection plan and require modification of the plan if the Administrator or his agent finds it deficient or ineffective.
9.5.4 The WDEQ may also rescind approval of an alternative inspection plan that is found to be ineffective.

9.6 Areas that meet final stabilization. Where there are areas that have achieved final stabilization (as defined in Part 2.8) the operator may document such in the facility SWPPP and omit those areas from further routine inspections. (*Examples of where this provision may apply include specific well pads or pipeline segments that have been stabilized that are part of a larger plan of development covered under a single storm water permit. Or the early phases of a large, phased subdivision development which may be stabilized before the later phases are completed.*)

9.7 Records. The operator shall keep a record of inspections and maintenance. The inspection record shall include:

9.7.1 Date and time of inspections;
9.7.2 Name(s) of personnel conducting the inspection
9.7.3 Findings of the inspector(s) including:
9.7.3.1 Locations of sediment or other pollutant discharges from the site;
9.7.3.2 Locations of BMPs that need to be maintained;
9.7.3.3 Locations of BMPs that failed to operate as designed or proved inadequate at controlling pollutants
9.7.3.4 Locations where additional BMPs are needed or that were not in place at the time of the inspection;
9.7.4 Corrective actions taken;
9.7.5 Dates and amount of all rainfall events greater than 0.5 inches in a 24-hour period for active construction projects that are inspecting under the 14-day schedule described in 9.2.1.1;
9.7.6 Documentation of any changes made to the SWPPP and SWPPP site map as a result of the inspection
9.7.7 When an inspection does not identify any incidents of non-compliance, the report shall contain a certification that the site is in compliance with the SWPPP and this permit.
9.7.8 This record shall be certified and signed in accordance with Part 10.7 of the permit and retained with the SWPPP.
9.7.9 The inspection record shall be made available to the Administrator upon request.

9.8 Severe weather exception. If any inspection is not possible due to severe weather or other dangerous conditions, the inspection report must document why the inspection did not occur, and the inspection must be conducted as soon as conditions allow.

9.9 Winter Conditions. Inspections on inactive construction sites, as described above in Part 9.2.2, will not be required where snow cover or frozen ground conditions exists over the

entire site for an extended period and melting conditions do not exist. This exception is applicable *only* during the period where melting conditions do not exist. Regular inspections, as described above, are required at all other times.

9.10 Retention of reports. Copies of the inspection reports shall be retained with the SWPPP and copies shall be provided to the Administrator upon request. Such reports shall be retained by the permittee for a minimum of three years.

9.11 Collection and submission of self-monitoring information. Upon written notification from the Administrator, the permittee shall collect and report storm water effluent and/or ambient water quality data of the type and at the frequency specified by the Administrator.

Part 10 Standard Permit Conditions

10.1 Duty to comply. The permittee must comply with all conditions of this permit, and is responsible for ensuring any subcontractors, employees or other persons associated with the construction activity comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Chapter 2 of the Wyoming Water Quality Rules and Regulations, the Wyoming Environmental Quality Act and the CWA and may be grounds for enforcement action, permit termination, revocation, or modification, or for denial of a permit renewal application. The permittee shall give the Administrator of the Water Quality Division advance notice of any planned changes at the permitted facility or of any activity which may result in permit noncompliance.

10.2 Penalties for violations of permit conditions. Article 9 of the Wyoming Environmental Quality Act provides significant penalties for any person who violates a permit condition. Any person who violates any condition of this permit is subject to a civil penalty not to exceed $10,000 per day of such violation, as well as other relief. Knowingly or willfully violating the permit may result in criminal penalties of up to $25,000 per day of violation and/or imprisonment for up to one year. Criminal penalties for subsequent knowing or willful violations of the permit may be up to $50,000 per day of violation and/or imprisonment for up to two years.

10.3 Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

10.4 Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

10.5 Duty to provide information. The permittee shall furnish to the Administrator, within a reasonable time, any information which the Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Administrator, upon request, copies of records required to be kept by this permit.

10.6 Other information. When the permittee becomes aware that he or she failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Administrator, he or she shall promptly submit such facts or information.

10.7 Signatory requirements. All NOIs, NOTs, NOTAs, SWPPPS, reports, and other information submitted to the Administrator shall be signed and certified.

10.7.1 All permit applications shall be signed as follows:

10.7.1.1 For a corporation: A principal executive officer of at least the level of vice president, or the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the overall operation of the facility from which the discharge originates;

10.7.1.2 For a partnership or sole proprietorship: by a general partner or the proprietor, respectively;

10.7.1.3 For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official.

10.7.2 All reports required by the permit and other information requested by the Administrator shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

10.7.2.1 The authorization is made in writing by a person described above and submitted to the Administrator; and

10.7.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

10.7.3 If an authorization under Part 10.7.2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part 10.7.2 must be submitted to the Administrator prior to or together with any reports, information or applications to be signed by an authorized representative.

10.7.4 Any person signing documents required by this permit shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware

that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

10.8 Penalties for falsification of reports and monitoring systems. The federal act provides that any person who knowingly makes any false statement, representation or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation or by imprisonment for not more than two years per violation or both.

10.9 Oil and hazardous substance liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA.

According to Chapter 4 of the Wyoming Water Quality Rules and Regulations, any spill or other release of hazardous substances, fuels, oils or other petroleum product must be contained and cleaned up in a timely and diligent manner. Any spill or release of more than 25 gallons, or which results in a visible sheen on water, or a visible deposit on the bottom or shoreline of any water body, must be reported to the Water Quality Division of the Wyoming Department of Environmental Quality within 24 hours to the department's 24-hour telephone number (307-777-7781). An online reporting form is also available at http://deq.state.wy.us/out/spills.htm. Refer to this website or Chapter 4 of the WWQRR for more information. Records of such spills or releases must be maintained for at least three years.

10.10 Property rights. The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

10.11 Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

10.12 Transfers. This permit is not transferable to any person except after notice to the Administrator. The Administrator may require the operator to apply for and obtain an individual WYPDES permit.

10.13 State laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state or federal law or regulation.

10.14 Facilities operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires

the operation of backup or auxiliary facilities or similar systems, installed by a permittee when necessary to achieve compliance with the conditions of the permit.

10.15 Monitoring and records

10.15.1 Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

10.15.2 The permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of the reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample measurement, report, or application. This period may be extended by request of the Administrator at any time.

10.15.3 Records of monitoring information shall include:

10.15.3.1 The date, exact place, and time of sampling or measurements;

10.15.3.2 The initials or name(s) of the individual(s) who performed the sampling or measurements;

10.15.3.3 The date(s) analyses were performed;

10.15.3.4 The time(s) analyses were initiated;

10.15.3.5 The initials or name(s) of the individual(s) who performed the analyses;

10.15.3.6 References and written procedures for the analytical techniques or methods used; and

10.15.3.7 The results of such analyses, including the bench sheets, instrument readouts, computer disks or tapes, etc., used to determine these results.

10.15.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

10.16 Availability of reports. Except for data determined to be confidential under Section 308 of the CWA, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Wyoming Department of Environmental Quality and the Regional Administrator of the Environmental Protection Agency. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA.

10.17 Adverse impact. The permittee shall take all reasonable steps to minimize any adverse impact to waters of the state resulting from noncompliance with any conditions specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

10.18 Bypass or upset of treatment facilities

10.18.1 Bypass means the intentional diversion of storm water around any treatment facility.

10.18.2 Any bypass is prohibited except where unavoidable to prevent loss of life, personal injury, or severe property damage, and there were no feasible alternatives to the bypass.

10.18.2.1 Anticipated bypass
If the permittee knows in advance of the need for a bypass, he or she shall submit prior notice at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass. The Administrator may approve an anticipated bypass, after considering its adverse effects, if the Administrator determines that it will meet the conditions listed above.

10.18.2.2 Unanticipated bypass or upset
The permittee shall submit notice of an unanticipated bypass or upset. Any information regarding the unanticipated bypass or upset shall be provided orally within 24 hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within five days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the bypass or upset and its cause; the period of the bypass or upset, including exact dates and times, and if the bypass or upset has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence.

10.19 <u>Upset conditions</u>

10.19.1 Upset means an exceptional incident in which there is unintentional and temporary noncompliance with the conditions of this permit because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improper designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

10.19.2 An upset constitutes an affirmative defense to an action brought for noncompliance with the conditions of this permit if the requirements of paragraph 10.18.2 are met.

10.19.3 A permittee who wishes to establish the affirmative defense of an upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

10.19.3.1 An upset occurred and that the permittee can identify the specific cause(s) of the upset;

10.19.3.2 The permitted facility was at the time being properly operated;

10.19.3.3 The permittee submitted notice of the upset as required under paragraph 10.18.2 above; and

10.19.3.4 The permittee complied with any remedial measures directed by the Administrator.

10.19.4 In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

10.20 Inspection and entry. The permittee shall allow the Administrator, the Administrator's representative, or an authorized representative of EPA, or in the case of a facility which discharges through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

10.20.1 Enter upon the premises where the regulated facility or activity is located or conducted and where records must be kept under the conditions of this permit;

10.20.2 Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

10.20.3 Inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

10.20.4 Sample or monitor, at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the CWA, any substances or parameters at any location.

10.21 Permit actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by a permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

10.22 Reopener clause. For good cause the Administrator may, at any time, require a permittee covered under this permit to obtain an individual permit, coverage under an alternative general permit, or this permit may be modified to include different limitations and/or requirements. Permit modification or revocation will be conducted according to Wyoming Water Quality Rules and Regulations, Chapter 2.

10.23 Civil and criminal liability. Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. As long as the conditions related to the provisions of "Bypass of Treatment Facilities" (Part 10.18), "Upset Conditions" (Part 10.19) are satisfied then they shall not be considered as noncompliance.

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Appendix A

The following waters are designated Class 1:

1. All surface waters located within the boundaries of national parks and congressionally designated wilderness areas as of January 1, 1999;

2. The main stem of the Snake River through its entire length above the U.S. Highway 22 Bridge (Wilson Bridge);

3. The main stem of the Green River, including the Green River Lakes from the mouth of the New Fork River upstream to the wilderness boundary;

4. The Main Stem of the Wind River from the Wedding of the Waters upstream to Boysen Dam;

5. The main stem of the North Platte River from the mouth of Sage Creek (approximately 15 stream miles downstream of Saratoga, Wyoming) upstream to the Colorado state line;

6. The main stem of the North Platte River from the headwaters of Pathfinder Reservoir upstream to Kortes Dam (Miracle Mile segment);

7. The main stem of the North Platte River from the Natrona County Road 309 bridge (Goose Egg bridge) upstream to Alcova Reservoir;

8. The main stem of Sand Creek above the U.S. Highway 14 bridge;

9. The main stem of the Middle Fork of the Powder River through its entire length above the mouth of Buffalo Creek;

10. The main stem of the Tongue River, the main stem of the North Fork of the Tongue River, and the main stem of the South Fork of the Tongue River above the U.S. Forest Service Boundary;

11. The main stem of the Sweetwater River above the mouth of Alkali Creek;

12. The main stem of the Encampment River from the northern U.S. Forest Service boundary upstream to the Colorado state line;

13. The main stem of the Clarks Fork River from the U.S. Forest Service boundary upstream to the Montana state line;

14. All waters within the Fish Creek (near Wilson, Wyoming) drainage;

15. The main stem of Granite Creek (tributary of the Hoback River) through its entire length;

16. Fremont Lake;

17. Wetlands adjacent to the above listed Class 1 waters.

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Appendix B

Acronyms Used in this Document

BMP – Best Management Practice

CFR – Code of Federal Regulations

CWA – Federal Clean Water Act

EPA – US Environmental Protection Agency

ESC – Erosion and Sediment Control

LOA – Letter of Authorization

NOI – Notice of Intent

NOT – Notice of Termination

NOTA – Notice of Transfer and Acceptance

SHWD – Solid and Hazardous Waste Division

SPCC – Spill Prevention Control and Countermeasure

SWPPP – Storm Water Pollution Prevention Plan

TMDL – Total Maximum Daily Load

WDEQ – Wyoming Department of Environmental Quality

WQD – Water Quality Division

WWQRR – Wyoming Water Quality Rules and Regulations

WYPDES – Wyoming Pollutant Discharge Elimination System

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Appendix C – Pollution Control Guidelines

General guidelines for designing, implementing and maintaining erosion and sediment controls and construction site housekeeping.

1. Erosion and Sediment Control Practices

1.1 Temporary (or permanent ponds or basins to be used for erosion and sediment control during construction) sediment ponds or basins must meet the requirements specified in Parts 7.9, 7.10 and 7.11 and be designed and operated in accordance with good engineering, hydrologic and pollution control principals.

1.2 Temporary soil stockpiles must have effective sediment controls, and cannot be placed in surface waters nor in storm water conveyances such as curb and gutter systems, or conduits and ditches.

1.3 Dirt ramps in gutters, such as those used to facilitate access across a curb to a construction area, must be removed at the end of each construction day to prevent storm water pollution; unless the permittee can make a demonstration that the project storm drainage system is isolated from the regional storm drainage system and surface waters of the state.

1.4 The normal wetted perimeter of any temporary or permanent drainage ditch that drains water from a construction site, or diverts water around a site, must be stabilized to a point at least 200 lineal feet above the downstream property edge, or from the point of discharge to any surface water of the state or direct conduit to a surface water of the state such as a storm drain system. Stabilization should be completed within 24 hours of connecting to a surface water or direct conduit to a surface water.

"Completed stabilization" in this case means that the ditch can handle the expected flow of a 2-year/24-hour storm event immediately upon stabilization. Seeding alone will not be considered adequate. More immediately effective BMPs such as appropriate matting (rated for expected flows) or appropriately sized riprap must be used. Any other BMP that offers equivalent protection may be used.

1.5 Pipe outlets must be provided with temporary or permanent energy dissipation within 24 hours of connection to a surface water. Splash pads and/or downspout extensions must be provided for roof drains to prevent erosion from roof runoff.

1.6 In order to maintain sheet flow and minimize rills and/or gullies, there should be no unbroken slope length of greater than 75 feet for slopes with a grade of 3:1 or steeper.

1.7 Temporary or permanent drainage ditches and sediment basins that are designed as part of a treatment system (e.g., ditches with rock check dams or permanent man-made water features such as ponds) require sediment control practices only as appropriate for site conditions.

1.8 Storm drain inlets in the immediate vicinity of the construction site must be protected by the appropriate BMPs during construction until all sources with the potential for discharging to the inlet have been stabilized. This includes storm drain inlets which may be affected by sediment tracked onto paved surfaces by vehicles or equipment. Inlet protection devices are a last line of control – additional sediment and erosion control practices must be used on site to reduce sediment reaching inlets. Inlet protection devices may be installed above an inlet, rather than in the inlet. Inlet protection devices must conform to local ordinances or regulations and must be designed in accordance with good engineering, hydrologic and pollution control practices.

In general inlet protection devices need to provide for drainage adequate to prevent excessive roadway flooding. Inlet protection may be removed for a particular inlet if a specific concern (i.e., street flooding/freezing, snow removal) has been identified and documented in the SWPP plan. In this situation, additional erosion and sediment control practices must be used to supplement for the loss of the inlet protection device to prevent sediment from entering a storm sewer system. Maintenance and cleaning of inlet protection devices, including on-site sediment and erosion controls, must be performed in accordance with Part 2 of this Appendix.

1.9 Where used as a primary sediment control between a disturbed area and a surface water of the state (or a direct conduit to a surface water of the state, such as a storm drain system), vegetated buffers must have a minimum width of 25 feet for every 125 feet of disturbed area which drains to the buffer. For each additional 5 feet of disturbance, an additional 1 foot of width must be added. The width of the buffer shall have a slope of 5% or less and the area draining to the buffer shall have a slope of 6% or less. Concentrated flows should be minimized throughout the buffer. Buffers shall consist of dense grassy vegetation, 3 to 12 inches tall with uniform coverage over 90% of the buffer. Woody vegetation shall not be counted for the 90% coverage. No more than 10% of the overall buffer may be comprised of woody vegetation. Where vegetation density does not meet this standard, additional BMPs must be employed above the buffer to minimize discharge of sediment to the surface water.

2. Maintenance Considerations for Erosion and Sediment Controls

2.1 All erosion prevention and sediment control BMPs must be inspected to ensure integrity and effectiveness. All nonfunctional BMPs must be repaired, replaced, or supplemented with functional BMPs. The permittee(s) must comply with the following inspection and maintenance requirements:

2.1.1 All control devices similar to silt fence or fiber rolls must be repaired, replaced, or supplemented when they become nonfunctional, the sediment reaches 1/3 of the height of the device or as recommended in the manufacture's specification (if

manufacturer's specifications are different, then a copy of the specifications should be kept with the SWPPP). Repairs and maintenance should be made within the following time frames.

2.1.1.1 Active construction sites. These repairs must be made within 24 hours of discovery, or as soon as field conditions allow access.

2.1.1.2 Inactive construction sites. These repairs must be made within 14 days of discovery, or as soon as field conditions allow access.

2.1.2 Temporary and permanent sedimentation ponds or basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the sediment storage volume. Drainage and removal must be completed within the following time frames.

2.1.2.1 Active construction sites. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.

2.1.2.2 Inactive construction sites. Drainage and removal must be completed within 14 days of discovery, or as soon as field conditions allow access.

2.2 Construction site egress locations must be inspected for evidence of sediment being tracked off-site by vehicles or equipment onto paved surfaces. Accumulations of tracked and deposited sediment must be removed from paved surfaces within 24 hours or, if applicable, within a shorter time if specified by local authorities or the Department. Vehicle tracking of sediment from the site must be minimized by BMPs. This may include having a designated egress with aggregate surfacing from the site, or by designating off-site parking. The permittee(s) is responsible for (or making the arrangements for) street sweeping and/or scraping if BMPs are not adequate to prevent sediment from being tracked onto the street from the site.

2.3 Vegetative buffers must be inspected for proper distribution of flows, sediment accumulation and signs of rill formation. If a buffer becomes covered with sediment, develops rills, or is otherwise rendered ineffective, other control measures shall be implemented. Eroded areas shall be repaired and stabilized.

3. Housekeeping and Standard Operating Procedures

3.1 Properly handle construction debris and waste materials. Provide appropriate container(s) on site for storing debris and other wastes until disposal. Litter and debris shall be picked-up as needed to reduce the chance for materials to be carried off the site by wind or water. Collected material shall be taken to an appropriate facility for disposal or recycling. Liquid or soluble materials including oil, fuel, paint and any other hazardous substances must be properly stored to prevent spills, leaks or other discharges. Storage and disposal of hazardous waste must be in compliance with applicable regulations.

3.2 Water from concrete washout or concrete grinding slurry shall not be discharged to any waters of the state, storm sewer systems or allowed to drain onto adjacent properties. Wash water disposal must be limited to a defined area of the site or to an area designated for cement washout. The area(s) must be of sufficient size to contain the wash water and residual cement. Where the potential for ground water contamination exists, disposal ponds

must be lined. The use of liners may require additional permits from the WQD Water and Wastewater Program. Signs shall be posted to identify disposal areas.

3.3 Portable toilets must be staked appropriately to prevent blow over or tipping due to vandalism or minor construction site accidents.

Attachment B

[RESERVED]

Attachment C

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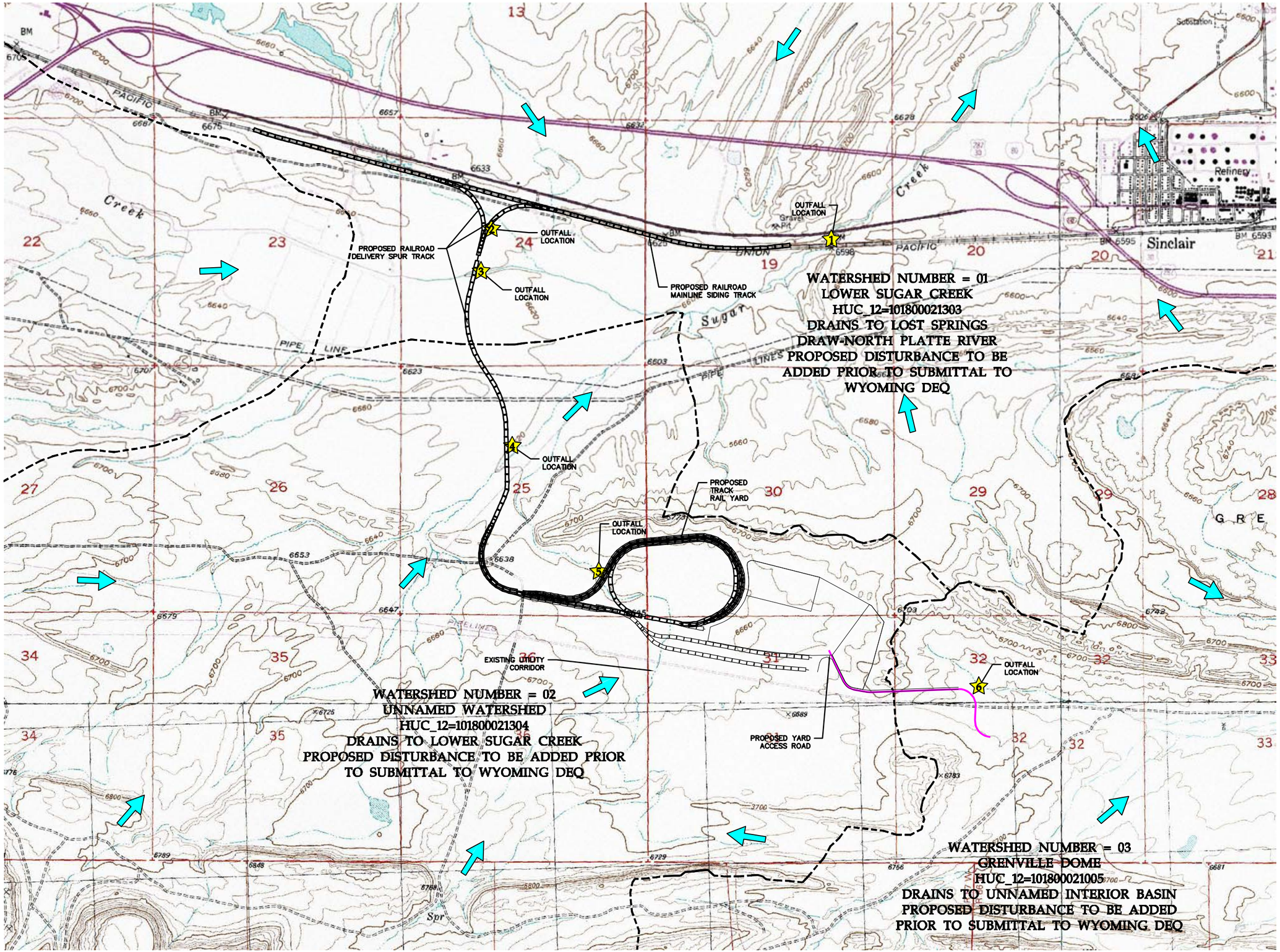

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Designed: DFK
Checked: RBC
Drawn: DFK
Record Drawing by/date:

Revisions:

#	DATE	DESCRIPTION

Prepared for:

Power Company of Wyoming LLC

LEGEND:

- PROPOSED ROAD
- WATERSHED BOUNDARY (HUC-12)
- GENERAL OVERLAND FLOW DIRECTION
- OUTFALL POINTS

N

0' 1000' 2000' 3000'

Chokecherry and Sierra Madre Wind Energy Project

Carbon County, Wyoming

Rail Yard USGS Map

West Sinclair
Rail Facility
NOT FOR CONSTRUCTION

Date: 09/11/13
Sheet: 1 OF 1

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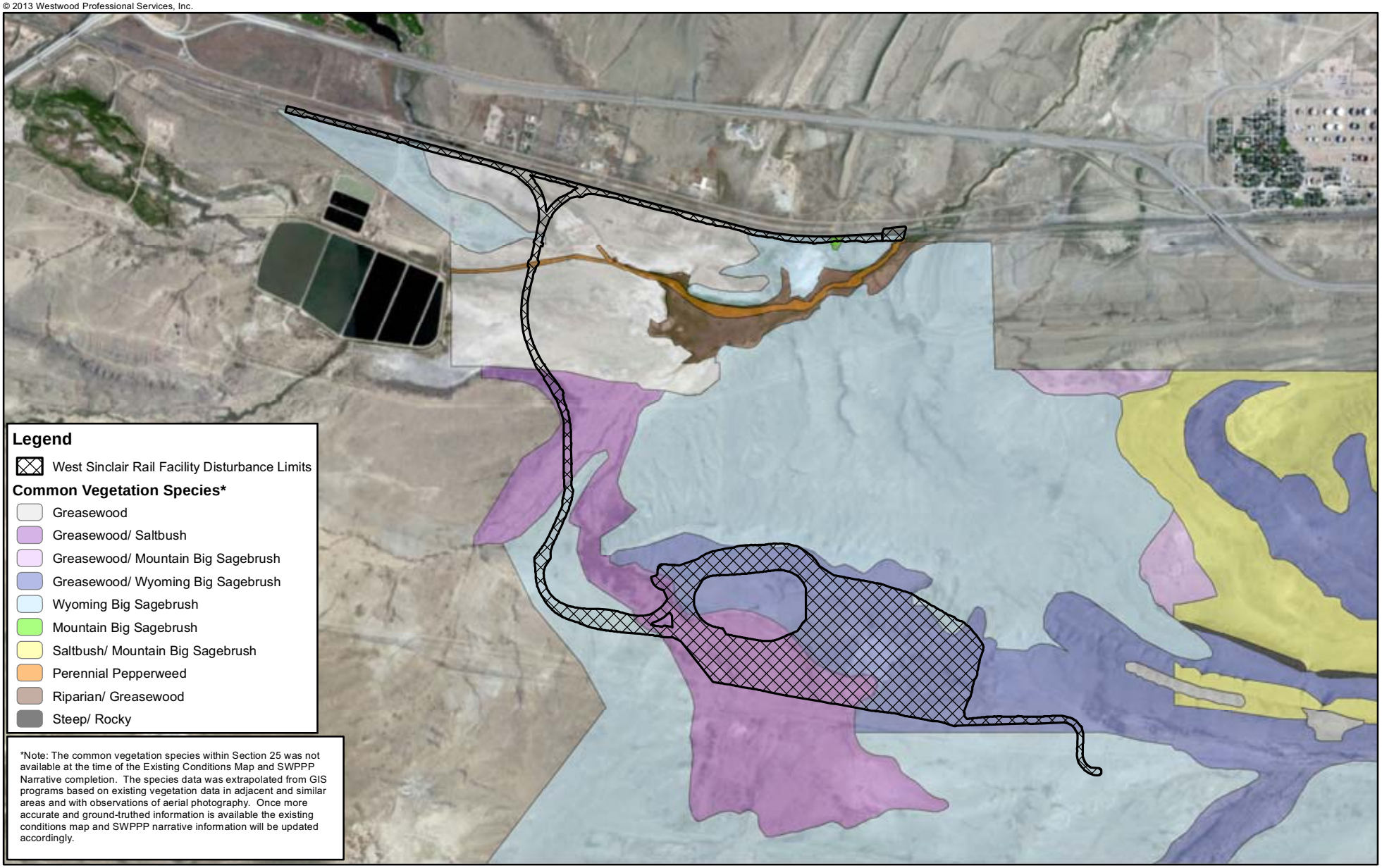

Data Source(s): BLM Vegetation (2009), Esri World Imagery (2013), Power Company of Wyoming (2013), and Westwood Professional Services, Inc. (2013).

Chokecherry and Sierra Madre Wind Energy Project
West Sinclair Rail Facility

Carbon County, Wyoming

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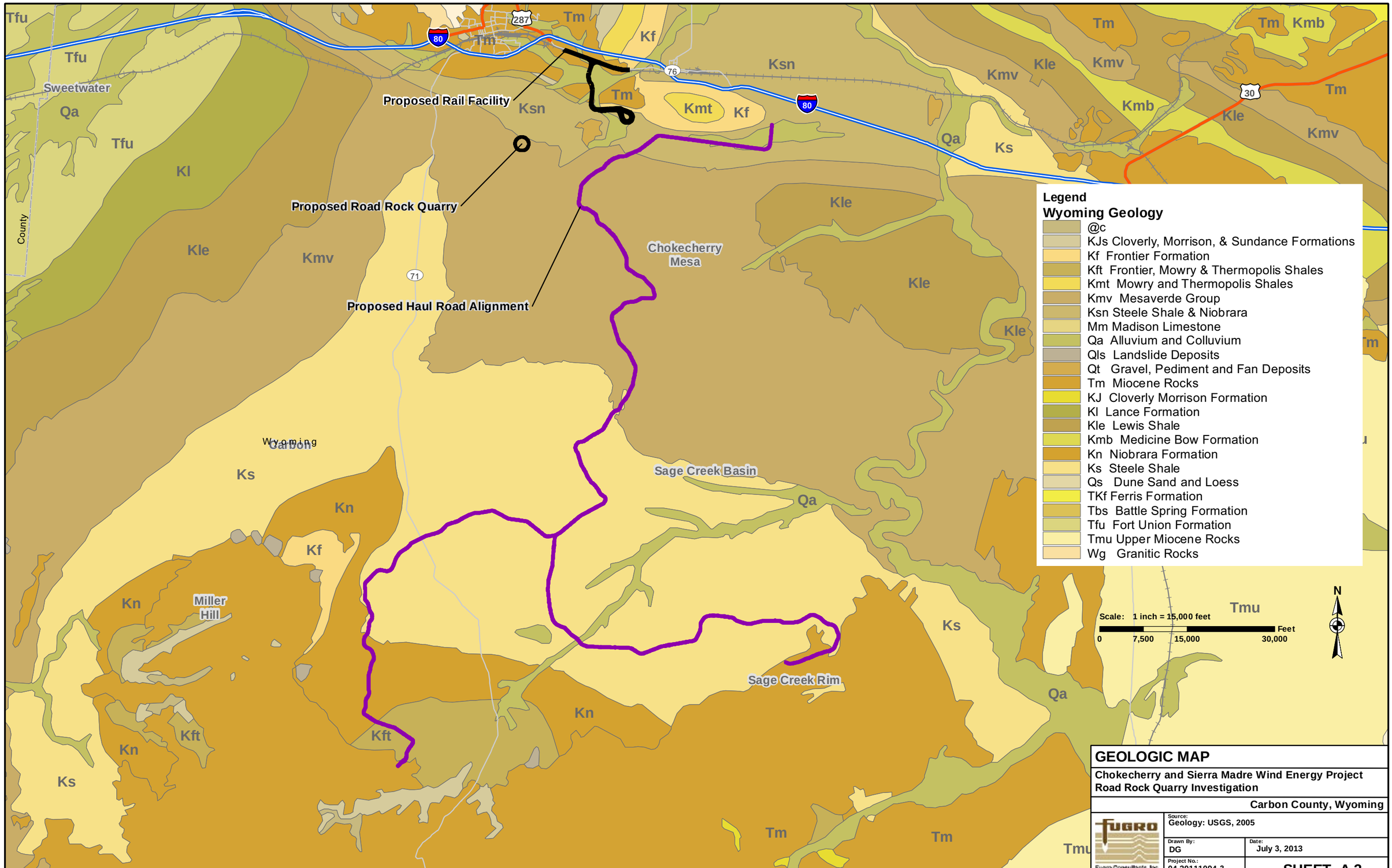
Existing Conditions Map

September 11, 2013



GEOLOGIC MAP

Chokecherry and Sierra Madre Wind Energy Project
Road Rock Quarry Investigation

Carbon County, Wyoming

Fugro Consultants, Inc.	Source: Geology: USGS, 2005	
	Drawn By: DG	Date: July 3, 2013
	Project No.: 04.30111094-3	**SHEET A.3**

Attachment D

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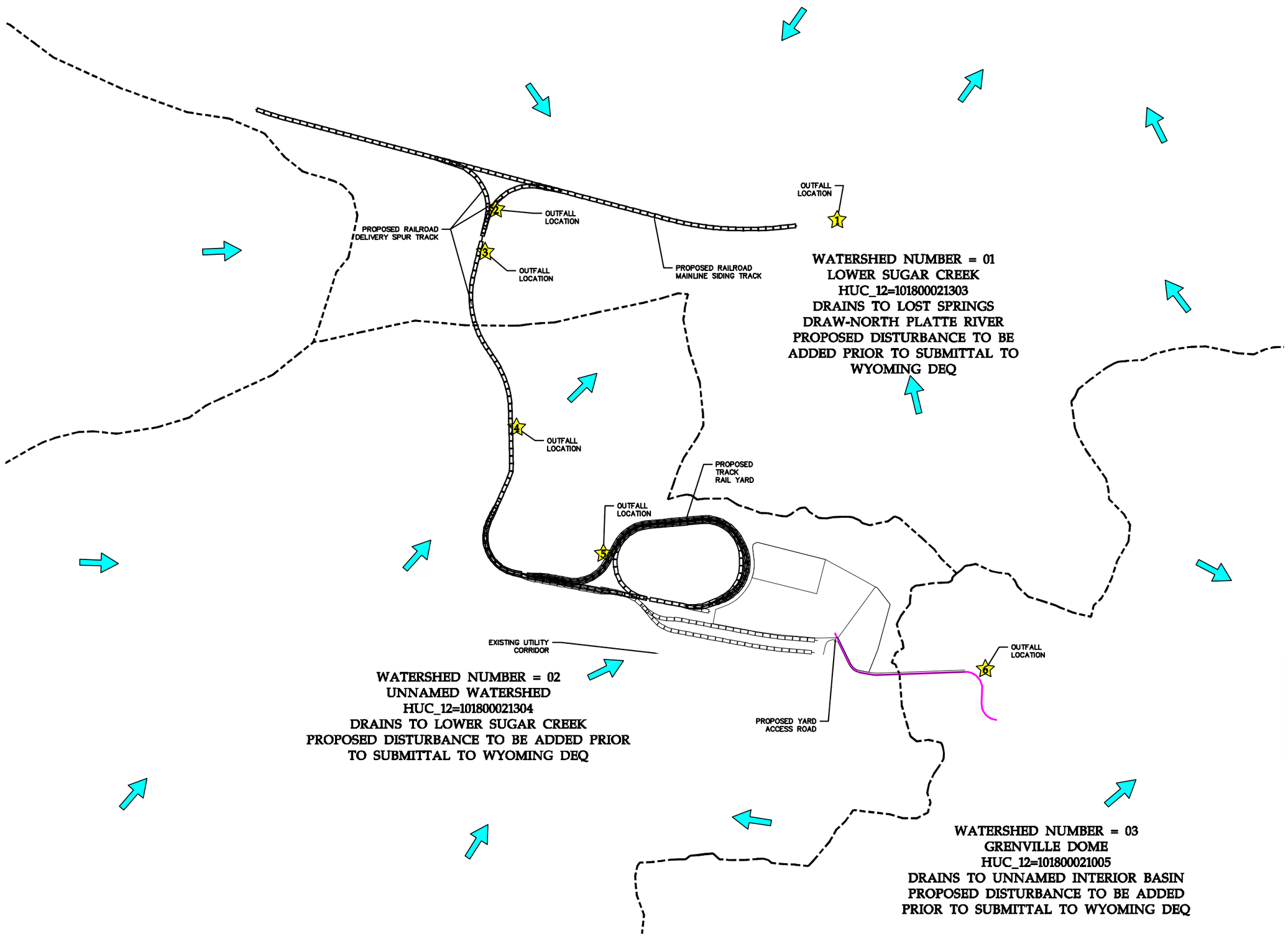

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#	DATE	DESCRIPTION
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Prepared for:

Power Company of Wyoming LLC

LEGEND:

- PROPOSED ROAD
- WATERSHED BOUNDARY (HUC-12)
- GENERAL OVERLAND FLOW DIRECTION
- # OUTFALL POINTS

N

0' 1000' 2000' 3000'

Chokecherry and Sierra Madre Wind Energy Project

Carbon County, Wyoming

Rail Yard Drainage Area Map

West Sinclair Rail Facility
NOT FOR CONSTRUCTION

Date: 09/11/13
Sheet: 1 OF 1

20111120SWPPP-RAIL-LAYDOWN.dwg

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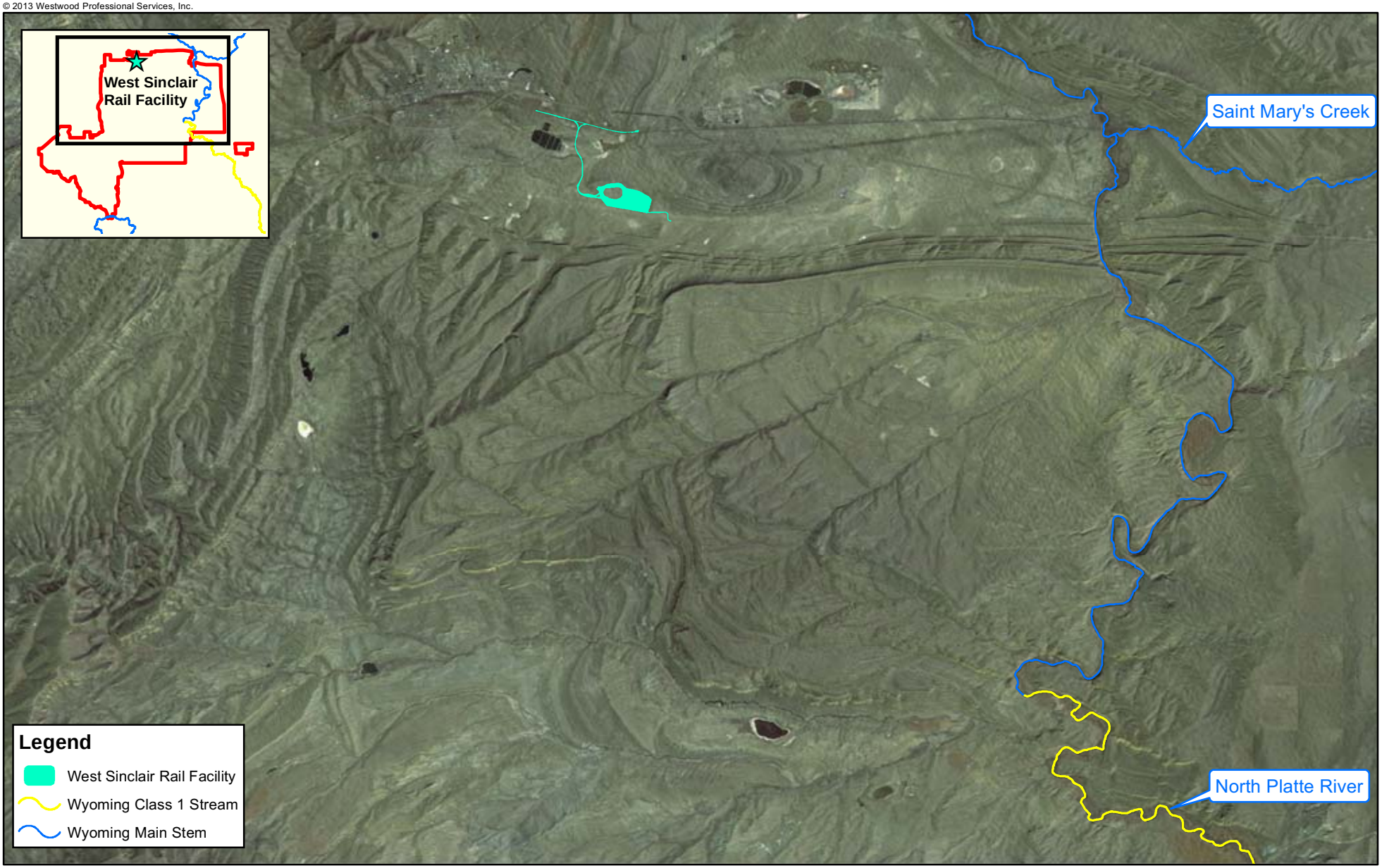

Data Source(s): NHD (2012), Esri World Imagery (2013) Power Company of Wyoming (2013), and Westwood Professional Services, Inc. (2013).

Chokecherry and Sierra Madre Wind Energy Project
West Sinclair Rail Facility

Carbon County, Wyoming

Project Proximity to TMDL, 303(d), Class 1, and Main Stem Waterbodies

September 11, 2013

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N

0 3 Miles

Attachment E

Stormwater Construction Site Inspection Report

General Information			
Project Name			
NPDES Tracking No.		**Location**	
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			

Type of Inspection:
❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event

Weather Information

Has there been a storm event since the last inspection? ❑Yes ❑No
If yes, provide:
Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):

Weather at time of this inspection?
❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds
❑ Other: Temperature:

Have any discharges occurred since the last inspection? ❑Yes ❑No
If yes, describe:

Are there any discharges at the time of inspection? ❑Yes ❑No
If yes, describe:

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	
11		❑Yes ❑No	❑Yes ❑No	
12		❑Yes ❑No	❑Yes ❑No	
13		❑Yes ❑No	❑Yes ❑No	

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
14		❑Yes ❑No	❑Yes ❑No	
15		❑Yes ❑No	❑Yes ❑No	
16		❑Yes ❑No	❑Yes ❑No	
17		❑Yes ❑No	❑Yes ❑No	
18		❑Yes ❑No	❑Yes ❑No	
19		❑Yes ❑No	❑Yes ❑No	
20		❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
4	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
12	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature:_____ **Date:**_____

SWPPP Inspection and Rain Event Log

Project Name: _____ **Owner:** _____

Operator: _____ **NPDES Permit ID:** _____

Inspector: _____

Date of Inspection	Type of Inspection		Date/Amount of Last Rain	Date of Inspection	Type of Inspection		Date/Amount of Last Rain	Date of Inspection	Type of Inspection		Date/Amount of Last Rain
	Biweekly	Event			Biweekly	Event			Biweekly	Event	

Corrective Action Report (to be kept with correlating inspection)

The top portion of this form must be completed within 24 hours of discovering the occurrence of one of the triggering conditions for maintenance

Date of Identification		Time of Identification		Project Name	
Identified condition					
Nature of condition					
How condition was identified					
Who identified condition (name, title, phone)					

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name | Signature | Date

The bottom portion of this form must be completed within 7 calendar days of completion of the action items listed above.

Date of follow up action	Summary of follow up actions (design, installation, maintenance)
Date modifications completed	**Summary of stormwater control modifications taken (attach implementation schedule to form)**

Are SWPPP modification required as a result of condition identified or corrective action taken? Yes ☐ No ☐

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Printed Name | Signature | Date

GRADING ACTIVITY/STABILIZATION LOG

Project Name: _____ **Owner:** _____

Operator: _____ **NPDES Permit ID:** _____

Inspector: _____

Description of Stabilization Measure and Location	**Date Grading Activity Started**	**Date Grading Activity Ceased** (Indicate Temp or Perm)	**Date When Stabilization Measures Initiated**	

SUBCONTRACTOR CERTIFICATION

STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

SWPPP Amendment No._____

Project Name: _____

Permit Number: _____

Certification of the
Storm Water Pollution Prevention Plan Amendment

"I certify under a penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____	_____
Operator's Signature	**Date**
_____	_____
Name and Title	**Telephone Number**

SWPPP Amendment Log

Project Name: _____ **Owner:** _____

Operator: _____ **NPDES Permit ID:** _____

Inspector: _____

Item #	Date of Change	Description of Change (Reference Plan Sheet Number)	Initial

Attachment F

[RESERVED]

Attachment G

[RESERVED]

Attachment H

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____Date:_____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ **Sediment and Erosion Controls**
- ❑ **Emergency Procedures**
- ❑ **Stabilization Controls**
- ❑ **Inspections/Corrective Actions**
- ❑ **Pollution Prevention Measures**
- ❑ **Spill Response and Good Housekeeping**

Specific Training Objective: _____

_____

_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Attachment I

NOTICE OF INTENT

TO REQUEST
DISCHARGE AUTHORIZATION
FOR STORM WATER FROM
LARGE CONSTRUCTION ACTIVITIES
(Under Large Construction General Permit WYR10-0000)

Official Use Only
Date received:

- ✓ Please print or type.
- ✓ All items must be completed accurately and in their entirety or the NOI will be deemed incomplete and will be returned. A complete SWPPP must be submitted before the NOI will be processed.
- ✓ Storm water discharges are covered under the large construction general permit when the Administrator provides a letter of authorization (LOA) to the applicant (see Part 1.2.4 of the permit).
- ✓ Authorizations issued under the general permit are subject to an annual $100 permit fee for as long as the authorization is active. See the permit for more information. There is no need to pay the fee with the application. Permit fees are invoiced after the end of the year.
- ✓ An original signature of the applicant is required. Faxes or emails cannot be accepted.

1. Sage Grouse Core Area Determination

Pursuant to the requirements of the Governor's Executive Order 2011-5, Greater Sage-Grouse Core Area Protection, the Wyoming Department of Environmental Quality (WDEQ) is working with the Wyoming Game and Fish Department (WGFD) to minimize the impact of development on the Greater Sage-Grouse population in Wyoming. To that end, operators of large construction projects must determine if any part of the project falls within a Greater Sage-Grouse Core Area (SGCA) before *applying for coverage under the Large Construction General Permit (LCGP). If any part of your project falls within a SGCA, the first point of contact for addressing sage-grouse issues is the WGFD. Coordinate with the WGFD and obtain a letter confirming consistency with the Executive Order* prior *to applying for coverage under the LCGP. Additional information and a map of SCGAs are available at http://deq.state.wy.us/wqd/wypdes_permitting/wypdes_storm_water/stormwater.asp.*

- ○ Some part of my project does fall within a SGCA → Contact WGFD for a consultation to address sage-grouse issues and obtain a letter confirming consistency with the Executive Order. (Note that your NOI will be returned without processing until you have consulted with the WGFD and obtained a letter confirming consistency with the Executive Order.)
- ○ Some part of my project does fall within a SGCA and I have contacted the WGFD for a consultation. A letter from the WGFD confirming consistency with the Executive Order is attached.
- ○ No part of my project falls within a SCGA → No additional requirements. Complete and submit your Notice of Intent.

2. Contact Information:

Permit Applicant			
Company Name:			
Legally Responsible Person: (See Item 8 below for description)	○ Mr. ○ Ms.		
Title:			
Mailing Address:			
City, State, ZIP Code:			
Telephone:		Fax:	
E-mail Address:			

Local Facility Contact	☐ **Same as Applicant**		
Company Name:			
Local Contact Name:	○ Mr. ○ Ms.		
Title:			
Mailing Address:			
City, State, ZIP Code			
Telephone:		Fax:	
E-mail Address:			

Billing Contact	☐ **Same as Applicant**		
Company Name:			
Billing Contact Name:	○ Mr. ○ Ms.		
Title:			
Mailing Address:			
City, State, ZIP Code			
Telephone:		Fax:	
E-mail Address:			

Assignment of Authorized Representative (optional section)

All reports required by the permit and other information requested by the Administrator shall be signed by a person described in Part 10.7 of the large construction general permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

10.7.2.1 *The authorization is made in writing by a person described above and submitted to the Administrator; and*

10.7.2.2 *The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position.*

Authorized name:	○ Mr. ○ Ms.	Telephone #:	
Title:		E-mail address:	
OR:			
Authorized position:		Telephone #:	
Position currently held by:	○ Mr. ○ Ms.	E-mail address:	

3. Project Information:

Project Name:	
Project County(ies)	
Project Location: Provide the location as either section, township and range OR a street address. For linear projects such as roads or pipelines provide the location of the endpoints.	
If this is a linear project add ending location. If more space is needed attach additional sheet(s):	
Latitude and longitude to the nearest 15 seconds: *This information is no longer optional.*	
If this is a WYDOT project, list project number(s) and WYDOT project engineer:	

4. Project Description:

Briefly describe the project:			
Area that your project will disturb during construction in acres:		Total disturbed area of the "larger common plan of development or sale" (if applicable):	
Date construction is planned to start:		Date "final stabilization" is expected:	

5. Receiving Waters and Municipal Storm Sewers:

Name(s) of the nearest defined drainage(s) which could receive runoff from the construction project, whether it contains water or not. Include bodies of water such as lakes and wetlands where applicable.	
Will storm water discharge from the project enter a municipal storm sewer?	☐ Yes ☐ No
If so, what municipality?	
To what water body does the storm sewer discharge?	
Identify all water bodies that are within 2000 feet the construction site and that may receive flow from the construction site that are: 1. Listed on the state's 303(d) report as impaired due to sediment, suspended solids or turbidity or 2. Have an approved TMDL for sediment, suspended solids or turbidity	

6. Attachments:

For any project that falls partly or completely within a Sage-Grouse Core Area: Provide a copy of a letter from the WGFD confirming consistency with the Executive Order

STOP! NOIs will not be processed without a letter confirming consistency with the Executive Order!

For all projects: A **complete SWPPP** must be submitted with the NOI for **all** projects. SWPPPs may be submitted as:

1. A hard copy with this SWPPP ***OR***;
2. (*Preferred*) Electronically (as PDF or Microsoft Word compatible format) on a CD or DVD with the NOI or to ***mailto:deq-stormwater@wyo.gov***. SWPPPs submitted by e-mail must include the permittee name and contact information and the project name and location.

STOP! NOIs will not be processed and authorizations will not be issued without a complete SWPPP!

Alternative inspection plans *only*. Operators seeking approval for alternative inspection schedules at the beginning of their project must submit the project SWPPP *and proposed inspection plan* with their NOI. Approval for an alternative plan may also be requested later (see Part 9.5 in the permit).

7. Copy of General Permit:

Do you wish to receive a paper copy of the Large Construction General Permit? ☐ Yes ☐ No

Those who check "no" will receive only a letter of authorization for their project.

8. Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. In addition, I certify that I am aware of the terms and conditions of the large construction general permit and I agree to comply with those requirements.

Authorized signatories for this notice of intent are the following "legally responsible persons:"	
For corporations:	*A principal executive officer of at least the level of vice president, or the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the overall operation of the facility from which the discharge originates.*
For partnerships:	*A general partner.*
For a sole proprietorship:	*The proprietor.*
For a municipal, state, federal or other public facility:	*Either a principal executive officer or ranking elected official.*

Printed Name of "Legally Responsible Person" _____ Title _____

Signature of "Legally Responsible Person" _____ Date _____

Section 35-11-901 of Wyoming Statutes provides that:

> "Any person who knowingly makes any false statement, representation, or certification in any application . . . shall, upon conviction, be fined not more than ten thousand dollars ($10,000) per day for each violation or imprisoned for not more than one (1) year, or both."

Mail or hand deliver this application to: WYPDES Storm Water Section DEQ/WQD Herschler Bldg. - 4W 122 West 25th Street Cheyenne, WY 82002	**DEQ use only:**	
	Outfall:	SW
	River Basin:	
	Stream Class:	
	City Code:	
	Basin Code:	
	HUC:	

Reset Form

NOTICE OF TRANSFER AND ACCEPTANCE

OF TERMS OF AN AUTHORIZATION UNDER THE *LARGE CONSTRUCTION GENERAL PERMIT* FOR STORM WATER DISCHARGES

Official Use Only
Date received:

---

1) To be completed by the <u>NEW</u> permittee:

I hereby accept transfer of this Wyoming Discharge Permit Authorization No. **WYR10-**___ ___ ___ ___, which was issued to _____ . I have reviewed the terms and conditions of the large construction general permit for storm water discharges and hereby assume and agree to pay, perform and discharge the obligations of said permit. I have also reviewed the storm water pollution prevention plan (SWPPP) for this project and will amend the SWPPP as necessary (see Part 7 of the general permit for requirements). This transfer will be (was) effective on:___._____

Name of construction project _____ County_____

Quarter/Quarter:_____ Section: _____ Township: _____ Range: _____

OR

Street Address: _____

City, State and Zip Code:_____

The NEW permittee is:

Company Name: _____

Mailing Address: _____

City, State and Zip Code: _____

Phone No.:_____ Fax: _____

Local Contact (familiar with facility):_____

Title _____ Phone Number _____

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

_____ _____
Signature of Permit Applicant (Legally Responsible Party – see next page) Date Signed

_____ _____
Name (printed) Title

2) To be completed by the <u>Previous</u> permittee:

As previous permittee, I hereby agree to the transfer of the permit referenced above and authorization and all responsibilities thereof.

Name: _____

Mailing Address: _____

City, State and Zip Code: _____

Phone No.: _____ Fax No.: _____

_____ _____
Signature of Permit Applicant (Legally Responsible Party – see below) Date Signed

_____ _____
Name (printed) Title

Return this form to the Department of Environmental Quality at the address below within 14 days of the transfer:

Section 35-11-901 of Wyoming Statutes provides that: "Any person who knowingly makes any false statement, representation, or certification in any application, . . . shall, upon conviction, be fined not more than ten thousand dollars ($10,000) per day for each violation or imprisoned for not more than one year or both."

Upon completion mail this notice to:

WYPDES Storm Water Section
DEQ/WQD
122 West 25th Street
Herschler Building - 4 W
Cheyenne, WY 82002

Authorized signatories for this Notice of Transfer and Acceptance are the following:	
For corporations:	*A principal executive officer of at least the level of vice president, or the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the overall operation of the facility from which the discharge originates.*
For partnerships:	*A general partner.*
For a sole proprietorship:	*The proprietor.*
For a municipal, state, federal or other public facility:	*Either a principal executive officer or ranking elected official.*

/bls
revised 8/06
2-0926-doc

NOTICE of TERMINATION
for projects covered under the
Large Construction General Permit

Official Use Only
Date received:

Use this form to terminate coverage under the Large Construction General Permit for storm water discharges (WYR10-0000). Do **not** use this form to transfer permit coverage to another operator.

1. Name, address, and telephone number of the company, individual, or organization which received authorization to discharge storm water under the general storm water permit for large construction activities:

   Name: _____

   Address: _____

   _____

   _____

   Telephone: _____ Fax: _____

2. Authorization number assigned to this project: WYR10- _____

   If this is a WYDOT highway project, list project number(s): _____

3. Project name and address or legal description of the location of the construction activity for which the original notice of intent (NOI) was filed:

   _____

   _____

   _____

   Quarter/ quarter Section Township Range:

   _____

   County: _____

4. Describe the condition of the permitted site. Is it revegetated, built over, paved over, other? See Part 5 of the permit for a description of when coverage may be terminated.

   _____

   _____

   _____

   _____

5. Certification:

I certify under penalty of law that for the construction project and permit described above, disturbed soils have been finally stabilized, as defined in Part 2.8. (or as modified in Part 5.3), to the extent necessary to ensure that storm water runoff from the site will not cause violation of Wyoming water quality standards (Chapter 1 of the Wyoming Water Quality Rules and Regulations).

I understand that by submitting this notice I am terminating coverage under Wyoming's Large Construction General Permit (WYR10-0000) for storm water discharges. I also understand that if, at a later date, it is determined that the site was inadequately reclaimed, I may be liable for discharging pollutants without a permit.

Printed Name of Person Signing Title

Signature Date Telephone

Authorized signatories for this notice of termination are the following:	
For corporations:	*A principal executive officer of at least the level of vice president, or the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the overall operation of the facility from which the discharge originates.*
For partnerships:	*A general partner.*
For a sole proprietorship:	*The proprietor.*
For a municipal, state, federal or other public facility:	*Either a principal executive officer or ranking elected official.*

Section 35-11-901 of Wyoming Statutes provides that: "Any person who knowingly makes any false statement, representation, or certification in any application, . . . shall, upon conviction, be fined not more than ten thousand dollars ($10,000) per day for each violation or imprisoned for not more than one year or both."

Upon completion mail or hand deliver this notice to:

WYPDES Storm Water Section
DEQ/WQD
122 West 25th Street
Herschler Building - 4 W
Cheyenne, WY 82002

/bls (revised 8/06)
2-0925-doc

Attachment J

[RESERVED]

Attachment K

[RESERVED]

APPENDIX J

Chokecherry and Sierra Madre Wind Energy Project
Weed Management Plan

West Sinclair Rail Facility

Prepared for

555 Seventeenth Street
Suite 2400
Denver, CO 80202

Prepared by

SWCA Environmental Consultants
295 Interlocken Blvd., Suite 300
Broomfield, CO 80021
(303) 487-1183 / Fax (303) 487-1245
www.swca.com

March 2014

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LIST OF ATTACHMENTS

Attachment
A. Noxious Weed Survey Report
B. Noxious Weed Distribution and Control
C. Pesticide Use Proposal Form

1.0 INTRODUCTION

The purpose of this Weed Management Plan ("Plan") is to prescribe methods to prevent, mitigate, and control the spread of noxious and invasive weeds during construction and operation of the West Sinclair Rail Facility (the "Project") proposed by Power Company of Wyoming LLC ("PCW"). Federal Invasive Species Executive Order 13112 defines an invasive plant as an alien, non-native, species whose introduction causes or is likely to cause economic or environmental damage or harm to human health (U.S. Federal Register 1999). A noxious weed is any plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife or property. Designated noxious weeds in the state of Wyoming and other noxious and invasive species of concern are listed in Table 1.

Table 1. Noxious Weed List for the State of Wyoming and Other Noxious and Invasive Species of Concern.

Common Name	Scientific Name
State of Wyoming[1]	
Field bindweed	*Convolvulus arvensis*
Canada thistle	*Cirsium arvense*
Leafy spurge	*Euphorbia esula*
Perennial sowthistle	*Sonchus arvensis*
Quackgrass	*Agropyron repens*
Hoary cress (whitetop)	*Cardaria draba* and *C. pubescens*
Perennial pepperweed (giant whitetop)	*Lepidium latifolium*
Ox-eye daisy	*Chrysanthemum leucanthemum*
Skeletonleaf bursage	*Franseria discolor*
Russian knapweed	*Centaurea repens*
Yellow toadflax	*Linaria vulgaris*
Dalmatian toadflax	*Linaria dalmatica*
Scotch thistle	*Onopordum acanthium*
Musk thistle	*Carduus nutans*
Common burdock	*Arctium minus*
Plumeless thistle	*Carduus acanthoides*
Dyers woad	*Isatis tinctoria*
Houndstongue	*Cynoglossum officinale*
Spotted knapweed	*Centaurea maculosa*
Diffuse knapweed	*Centaurea diffusa*
Purple loosestrife	*Lythrum salicaria*
Saltcedar (tamarisk)	*Tamarix* spp.
Common St. Johnswort	*Hypericum perforatum*
Common tansy	*Tanacetum vulgare*
Russian olive	*Elaeagnus angustifolia*
Other Noxious and Invasive Species of Concern	
Larkspur	*Delphinium* spp.
Halogeton	*Halogeton glomeratus*
Wyeth's Lupine	*Lupinus wyethii*
Pricklypear	*Opuntia* spp.
Black henbane	*Hyoscyamus niger*
Common cocklebur	*Xanthium strumarium*

Sources: [1]Wyoming Weed and Pest Council 2011

Noxious and invasive weeds can move into disturbed areas and dominate or disrupt natural communities or restoration projects. Noxious weeds compete with native species for soil, water, and other limiting resources. Noxious weeds are often able to out-compete native vegetation and can form monocultures. This degrades the value of agricultural and natural resources, including wildlife habitat. Management of noxious and invasive weeds is a reclamation requirement in the Wyoming Bureau of Land Management (BLM) Reclamation Policy (BLM 2009). The Rawlins Field Office of the BLM has zero tolerance for state-listed noxious weed species. Therefore, weed management is an important part of the reclamation procedures outlined in the master and site-specific reclamation plans for the CCSM Project.

2.0 CURRENT WEED DISTRIBUTION AND MANAGEMENT

Weed management in the Project Site is a cooperative effort between the surface landowner and the BLM. Noxious and invasive weeds are controlled annually using herbicides. The Overland Trail Cattle Company LLC ("TOTCO"), which owns the vast majority of private lands within the Project Site, and BLM have cooperatively participated in weed control since 1999. An experimental weed burn was jointly conducted in June 2003 (Newberry 2010). The weed burn occurred on Little Sage Creek to remove thick overstory vegetation to better locate and treat perennial pepperweed and Russian knapweed. Weed management in the Project Site will continue in a manner consistent with past efforts and will include coordination between PCW, the surface landowner, and the BLM.

In 2012 and 2013, SWCA biologists completed biological resource surveys of the Project Site. Surveys were conducted within all planned disturbance areas as well as a 100 foot minimum buffer surrounding all limits of disturbance. During survey efforts, biologists recorded any occurrences of noxious and invasive species and identified areas that could serve as potential vectors for noxious and invasive species (Attachment A). Prior to the surveys, previously known noxious weed occurrences were reviewed to inform survey efforts and an assessment was completed to identify areas that could be potential vectors for noxious weeds. Most of the identified weed occurrences are associated with drainages, water features, and disturbed areas.

The most common noxious weed species on the CCSM Project Site occur within the Sage Creek Basin and Bolten sub-regions and include halogeton (*Halogeton glomeratus*), whitetop (*Cardaria draba*), perennial pepperweed (*Lepidium latifolium*), Russian knapweed (*Acroptilon repens*), cheatgrass (*Bromus tectorum*), leafy spurge (*Euphorbia esula*), and Canada thistle (*Cirsium arvense*). Cheatgrass is found locally throughout the CCSM Project Site but does have a tendency to be found in the sandier soils. Less common weeds include perennial sowthistle (*Sonchus arvensis*), black henbane (*Hyoscyamus niger*), Russian thistle (*Salsola kali*), poverty weed (*Iva axillaris*), and saltcedar (*Tamarix* spp.). Detailed weed mapping of areas to be disturbed will be performed immediately prior to construction when weeds can be treated, avoided, and/or weedy topsoil can be segregated during construction.

3.0 WEED MANAGEMENT APPROACH

Noxious and invasive weed control will occur for the life of the Project. Noxious weed occurrences within the Project right of way and areas where invasive weeds are problematic and may potentially contribute to a significant proportion of the vegetation community have been identified and delineated and will be updated as needed throughout the life of the Project. Weed management will be in accordance with the procedures established in this Plan and the control options described in Attachment B. Weed management will be implemented prior to surface-disturbing activities and during reclamation stage as described in the master and site-specific reclamation plans. The efficiency of the prescribed control measures will be evaluated throughout the Project and the reclamation process.

Weed management for the Project will be dynamic. This approach will be successful by implementing the following actions (Tu and Meyers-Rice 2001):

1. Establish and record weed management goals, while identifying noxious and invasive species that prevent these goals from being reached and prioritize those species based on the severity of their effects.
2. Identify the presence, distribution, and density of noxious and invasive species throughout the Project Site.
3. Develop and implement weed control plans to prevent, control, and/or eliminate the effects of priority weed species and, if necessary, re-order priorities based on likely effects on target and/or non-target species.
4. Evaluate the effectiveness of the weed control plans through monitoring, and use this information to modify and improve weed management goals, control priorities, methods, and plans.

3.1 WEED MANAGEMENT GOALS

The goal of weed management in the Project Site is to minimize the spread of noxious and/or invasive plant species during the construction and operation of the Project. PCW will assist federal, state, and local agencies' weed control efforts; comply with requirements designed to prevent the spread of noxious and/or invasive plant species; and implement weed control measures on areas of the Project that are identified to be of special concern. Success standards, as defined in the master and site-specific reclamation plans, will be used to assess whether revegetation requirements for the Project are being met (BLM 2011a). Part of successful revegetation includes maintaining native plant communities with minimal undesirable plant species. Success standards and management goals are designed to be site-specific to each surface-disturbing activity and the surrounding vegetation.

3.1.1 Priorities for Weed Management

PCW will coordinate with the BLM Authorized Officer (AO) to determine priorities for weed management on federal lands in the Project Site. Private landowners, and the State Board of Land

Commissioners or the Wyoming Game and Fish Commission will be consulted as appropriate for weed management activities on private and state lands, respectively. Weed species that present the greatest threat to achieving the management goals and that need to be controlled immediately are the highest priority. Factors to consider when establishing priorities and suggested rankings (Tu and Meyers-Rice 2001; Colorado Natural Areas Program [CNAP] 2000) are as follows:

- Current extent and expansion potential of the species/population in or near the Project Site.
- Current and potential effects of the species.
- Value of the habitats/areas that the species infests or may potentially infest.
- Difficulty of control.

Once identified, a specific control plan for each priority species will be developed using the appropriate control options described in Attachment B. The specific control plan will identify species in need of controlling, treatment locations, period of control, methods to use, and monitoring.

3.2 INVENTORY OF WEED SPECIES

The presence, distribution, and cover of noxious and invasive weeds in areas to be disturbed by the Project were assessed in 2012 and 2013. Weed surveys of areas to be disturbed were conducted during the growing season to determine occurrence and abundance within the Project Site. Surveys were conducted within all planned disturbance areas as well as a 100 foot minimum buffer surrounding all limits of disturbance. Surveys focused on resources within areas planned for development, including access roads, work areas, and transmission line corridors. Data was collected using handheld data-logger units and geo-referenced using global positioning system (GPS) locations and delineated shapefiles. Results from these surveys will be used to develop the specific control plan for each priority species and assist in monitoring efforts.

3.3 WEED MANAGEMENT ACTIONS

The spread of noxious and invasive weeds is a significant concern in projects that involve any surface-disturbing activities. Measures must be taken to prevent, control, and/or eliminate the effects of these species; and in areas where prevention is not possible, active management and/or control measures must be put in place. Best management practices (BMPs) are necessary to ensure that existing weed occurrences are appropriately identified and controlled, subsequent spread is prevented, and new populations of noxious weeds do not emerge.

3.3.1 Prevention

Prevention is the most cost-effective approach to noxious and invasive weed management. PCW will assist federal, state, and local agency noxious and invasive weed control efforts; comply with preventative requirements; and implement weed control measures on areas of the Project identified to be of special concern. The following preventive measures will be implemented to prevent the spread of noxious and invasive weeds:

- Prior to construction, provide contractors with information and training regarding noxious weed management, weed identification, and the effects of such weeds on agriculture, livestock, and wildlife. The contractors will be informed of the importance of preventing the spread of noxious and invasive weeds in areas not infested and of controlling the proliferation of weeds already present.
- Prior to construction, noxious and invasive weed infestation areas of concern will be identified and flagged in the field by qualified personnel. The flagging will alert construction personnel to the infestation so that appropriate BMPs may be applied.
- In areas where infestations were identified and flagged in the field, the construction contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they were stripped to eliminate the transport of soil-borne noxious and invasive weed propagules. These weed-infested stockpiles will be marked with clearly visible signage until reclamation. Soil and vegetative matter will not be moved outside of the identified and marked noxious and invasive weed infestation areas.
- Vehicles and earth moving equipment will be washed when entering the Project Site for the first time and will be rewashed after any off road travel through identified and flagged noxious and invasive weed infestation areas.
- Ensure that straw or hay bales used for sediment barrier installations or mulch distribution are weed-free. If weed-free bales are unavailable, use alternative weed-free sediment barrier installations.
- Implement stabilization and/or reclamation of disturbed lands immediately following construction, as outlined in the master and site-specific reclamation plan.
- Reseeding areas following site disturbance is important. Reseeding will occur as set forth in the site-specific reclamation plans. Continuing revegetation efforts with native seed mixes provides soil stabilization, promotes the establishment of native plant communities, and potentially prevents the spread of noxious and invasive weeds from competition of native plants.
- Disturbed ground may require chemical or mechanical weed control before weeds go to seed.

3.3.2 Treatment Methods

PCW will implement noxious and invasive weed control measures and BMPs in accordance with existing regulations and jurisdictional land management agency or landowner agreements. PCW will continue coordinating with appropriate agencies to determine which weed species will require treatment and/or site-specific mitigation approaches. Within the Project Site, noxious and invasive weed control will be conducted using herbicide treatment methods. Treatment methods other than herbicide application, such as cultural, mechanical, biological, and enhancement measures, will be considered during the reclamation process to facilitate noxious weed control (Attachment B).

Herbicide

Herbicide application will be used to treat any identified noxious and/or potentially problematic invasive plant population in an effort to reduce infestations prior to soil disturbance caused by construction. Post-reclamation strategies will entail either herbicide application or mechanical treatment to noxious weeds in infestation areas depending on the phenology of the weed species. Herbicide application will occur either following seedbed establishment or after allowing two seasons of growth. Mechanical controls will be used between herbicide treatments to provide short-term control and minimize weed establishment (see below). For most noxious weeds, herbicide spraying is most effective in early spring. On all BLM-administered lands, a pesticide use permit (PUP) will be required prior to any herbicide application (BLM 2011b) (Attachment C).

Only herbicides that are approved for use by the land management agency or landowner will be used. Treatments will not be conducted during precipitation events or when precipitation is expected within 24 hours. If weeds targeted for herbicide treatments are found in the vicinity of limited reclamation potential (LRP) areas or sensitive sites (as outlined in the site-specific reclamation plans), proper buffers established in coordination with the BLM and local agencies will be used to prevent the spread of herbicides to these areas. If weeds are found in LRP areas or sensitive sites, cultural and/or mechanical controls will be implemented. In areas where noxious and invasive weeds may be interspersed with native vegetation, the herbicide application method will be adapted to target only weeds and therefore preserve and retain native plants.

The effects to special status species (see BLM Manual 6840 Special Status Species) will be considered when designing herbicide treatment programs. A selective herbicide and a wick or backpack sprayer will be used to minimize risks to special status plants. Vegetation will not be treated with herbicide during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in the treatment area. Other treatment methods (i.e., cultural or mechanical treatment) will be implemented during these periods.

Herbicide application is an effective means of reducing the size of noxious weed populations. Applications will be controlled to minimize effects on surrounding vegetation. In areas of dense infestation, a broader application will be used and a follow-up seeding program implemented. Supplemental seeding will be based on criteria outlined in the site-specific reclamation plans. The timing of subsequent revegetation efforts will be based on the life of the selected herbicide.

BLM Manual 9011 (Chemical Pest Control) outlines the policies, and BLM Handbook H-9011-1 (Chemical Pest Control) outlines the procedures, for use of herbicides on public lands. An approved Pesticide Use Proposal is required to apply chemical herbicide (Attachment C). All herbicide applications on BLM-administered public lands are required to be applied by a certified commercial applicator(s) and all herbicides used must be from the current list of herbicides approved for application on BLM-administered lands (BLM 2011b).

Cultural/Mechanical

Cultural control refers to management practices that prevent weed spread and promote competition from other native plants (BLM 2011b). This may include native plant seeding, burning, flooding, and limiting livestock grazing or recreational uses in infested areas.

Mechanical control includes mowing, chopping, and discing, which are very effective short-term control. Repeating mechanical treatment weakens plants making them susceptible to disease and competition from other native plants and depletes food reserves. Mowing weeds in newly revegetated areas during the first season of establishment, prior to seed formation, could minimize weed establishment.

3.4 MONITORING

The purpose of the monitoring program is to document whether areas that have been reclaimed are progressing toward revegetation and ecosystem reconstruction. Part of successful revegetation includes maintaining native plant communities with minimal weed species. Monitoring of noxious and invasive weeds will be conducted as part of the reclamation success monitoring described in the site-specific reclamation plans. Invasive plant species should account for less than 5 percent total plant cover, and reclamation species should be outcompeting weed species within two years of reclamation initiation. State-listed noxious weeds (Table 1) should account for 0 percent of the total plant cover. The BLM Rawlins Field Office has a zero tolerance policy for state-listed noxious weed species. Noxious and invasive weeds will be monitored annually in all areas affected by Project construction.

Infestations of noxious and invasive weeds noted during monitoring activities will be treated according to the methods described in this Plan. Small infestations will likely be treated locally with herbicide applications appropriate for the specific species. When a large infestation occurs or reoccurs, an evaluation will be performed to determine what led to the infestation, a specific weed control plan will be developed or modified, and a treatment strategy will be implemented. This evaluation will be made available to relevant local noxious weed supervisory authorities.

The assessment and monitoring of revegetation efforts will take place annually. Known infestation areas and areas of special concern will be monitored, evaluated, and controlled annually and until the noxious and invasive weed occurrence is eradicated or controlled. If necessary, the monitoring schedule may become more or less frequent.

3.5 RECORDKEEPING

Treatment of known infestations will begin prior to initiation of construction activities. Any identified populations will be treated in an effort to reduce infestations prior to soil disturbance caused by construction. Site-specific treatment plans, including pesticide use proposals (PUPs), will be developed describing treatment location, materials and methods used, and approximate schedule for control and monitoring activities. Only herbicides that are approved for use by land managing

agencies or landowners will be used and all herbicides will be applied in accordance with their label requirements.

Infestations will be monitored annually to track success of treatment. The boundary of each weed population will be mapped using GPS and data will be recorded including percent cover of each species. Results of monitoring will be used to determine adaptive management strategies and how the treatment plan should be modified to ensure success. Information on each treatment will be recorded regularly to help determine the best herbicide or combination of control methods using the table below or a similar format.

Table 2. Record of Noxious Weed Treatments

Location	Treatment Date	Control Method Applied	Follow up Date	Follow up notes (how successful was treatment)

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Attachment A

Noxious Weed Survey Report
West Sinclair Rail Facility

July 2013
(Updated March 2014)

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final Environmental Impact Statement (EIS) concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD (BLM 2012), BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre (Figure 1). The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. To inform the subsequent environmental analysis, BLM requested that PCW conduct surveys for noxious and invasive weed species.

SWCA Environmental Consultants (SWCA) conducted noxious weed species surveys for the West Sinclair Rail Facility (Rail Facility) site in 2012 and 2013. The Rail Facility site consists of the rail line, offloading and lay down areas associated with the rail line extension. Noxious and invasive weed species surveys focused on the potential occurrence of state listed noxious weeds as well as other non-listed invasive species. Areas that could serve as potential vectors for noxious and invasive species were also identified.

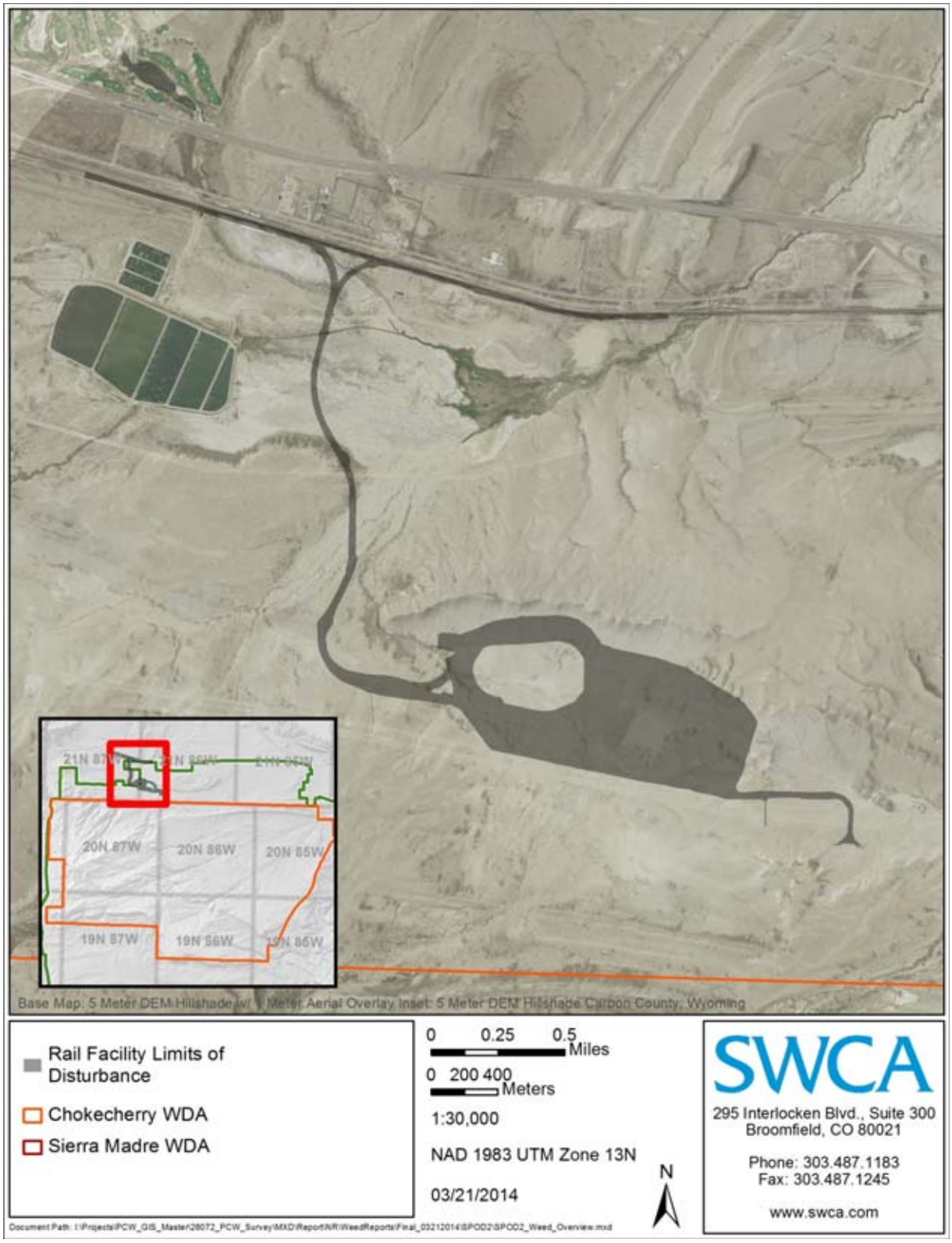

Figure 1. Overview of the West Sinclair Rail Facility Limits of Disturbance.

2.0 BACKGROUND AND METHODS

SWCA biologists completed biological resource surveys of the Rail Facility site in 2012 and 2013. Surveys were conducted within all planned disturbance areas associated with the Rail Facility site as well as a 100-foot minimum buffer surrounding all planned disturbances (Figure 1). During survey efforts, biologists recorded any occurrences of noxious and invasive species (Table 1).

Table 1. Noxious and Invasive Weed Species List for the CCSM Project

Common Name	Scientific Name	USDA/NRCS Plant Codes
State of Wyoming[1]		
Canada thistle	*Cirsium arvense*	CIAR4
Diffuse knapweed	*Centaurea diffusa*	CEDI3
Leafy spurge	*Euphorbia esula*	EUES
Houndstongue	*Cynoglossum officinale*	CYOF
Perennial sowthistle	*Sonchus arvensis*	SOAR2
Perennial pepperweed	*Lepidium latifolium*	LELA2
Hoary cress (whitetop)	*Cardaria draba*	CADR
Russian knapweed	*Acroptilon repens*	ACRE3
Musk thistle	*Carduus nutans*	CANU4
Saltcedar (tamarisk)	*Tamarix* spp.	TAMAR
Spotted knapweed	*Centaurea stoebe* ssp. *micranthos*	CESTM
Other Noxious and Invasive Species of Concern		
Halogeton	*Halogeton glomeratus*	HAGL
Black henbane	*Hyoscyamus niger*	HYNI
Cheatgrass	*Bromus tectorum*	BRTE
Poverty weed	*Iva axillaris*	IVAX

Sources: [1]Wyoming Weed and Pest Council 2013

Prior to the surveys, previously known noxious weed occurrences were reviewed to inform survey efforts (BLM 2012). Within the Rail Facility Site, BLM has recorded occurrences of two noxious weed species, Russian knapweed (*Centaurea repens*) and perennial pepperweed *(Lepidium latifolium*). Russian knapweed occurrences have been documented along the Union Pacific railroad corridor and perennial pepperweed has been document throughout the Sugar Creek drainage (BLM 2012). In addition to these occurrences, povertyweed (*Iva axillaris*) was documented associated with a black greasewood (*Sarcobatus vermiculatus*)/inland saltgrass (*Distichlis spicata*) shrubland during wetland delineations in the Rail Facility Site. Halogeton and cheatgrass are known to occur in the pipeline corridor south of the Rail Facility.

3.0 RESULTS AND DISCUSSION

Surveys in the Rail Facility site identified no new occurrences of noxious and invasive species within the Rail Facility Site. Surveys did document previously known populations of Russian knapweed along the Union Pacific railroad corridor as well as occurrences of halogeton and cheatgrass along existing roads, fences, and pipeline rights-of-ways. Additionally, povertyweed and perennial pepperweed were identified in scattered locations during wetland surveys.

No additional occurrences of noxious or invasive weed species were identified during survey efforts. However, an assessment was completed to identify areas that could be potential vectors for noxious weeds. Pre-construction and post-construction monitoring will occur in these areas to minimize the chances of establishment by noxious and invasive species. Figures 2 through 6 identify the known noxious weed locations identified in the Rail Facility survey area as well as the areas that could serve as potential vectors for noxious and invasive species.

4.0 REFERENCES

Bureau of Land Management (BLM). 2012. Final Environmental Impact Statement for the Chokecherry and Sierra Madre Wind Energy Project. Bureau of Land Management Rawlins Field Office, Carbon County, Wyoming. June 2012.

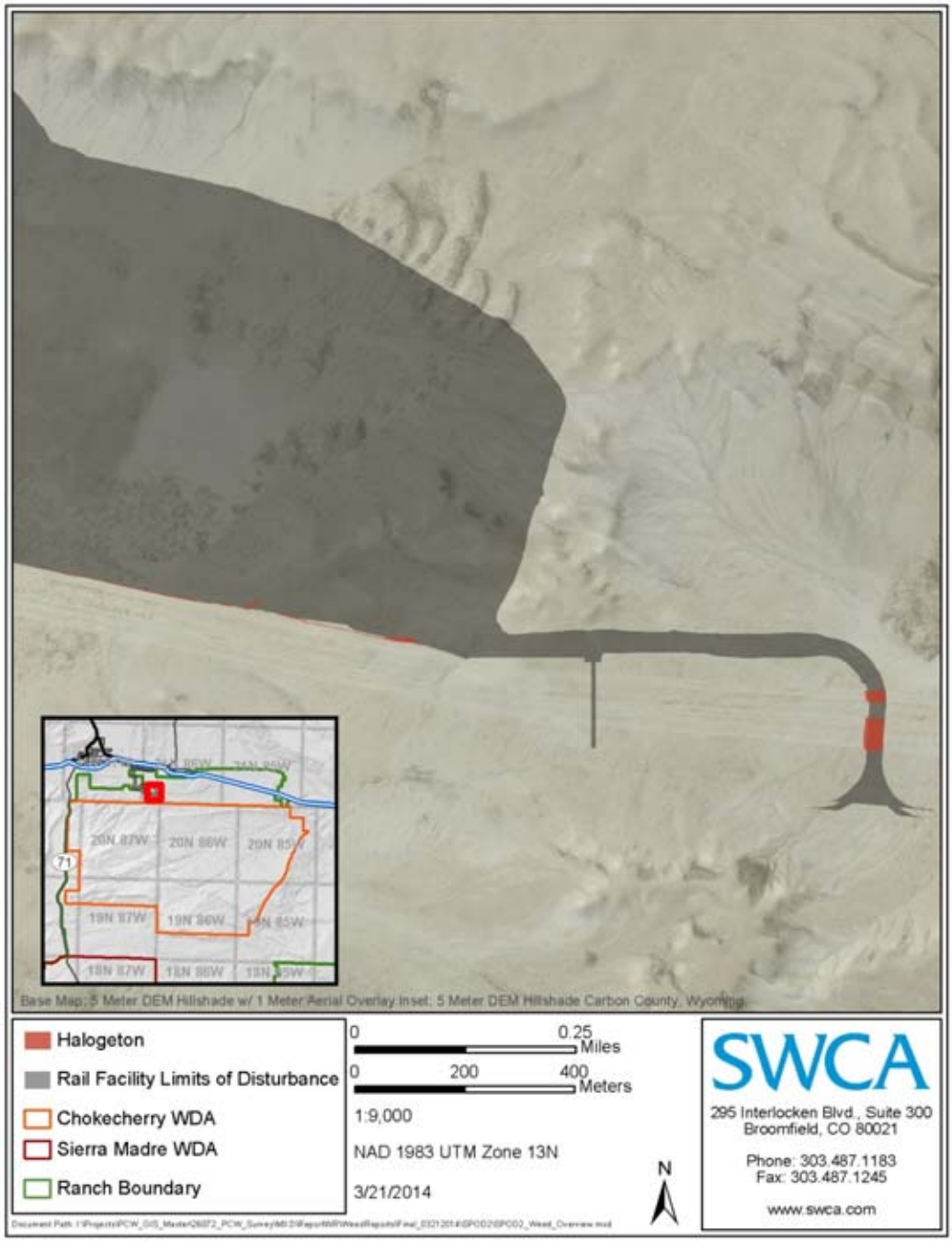

Figure 2. Identified occurrence of halogeton along existing pipeline rights-of-way in the southeastern portion of the Rail Facility Site.

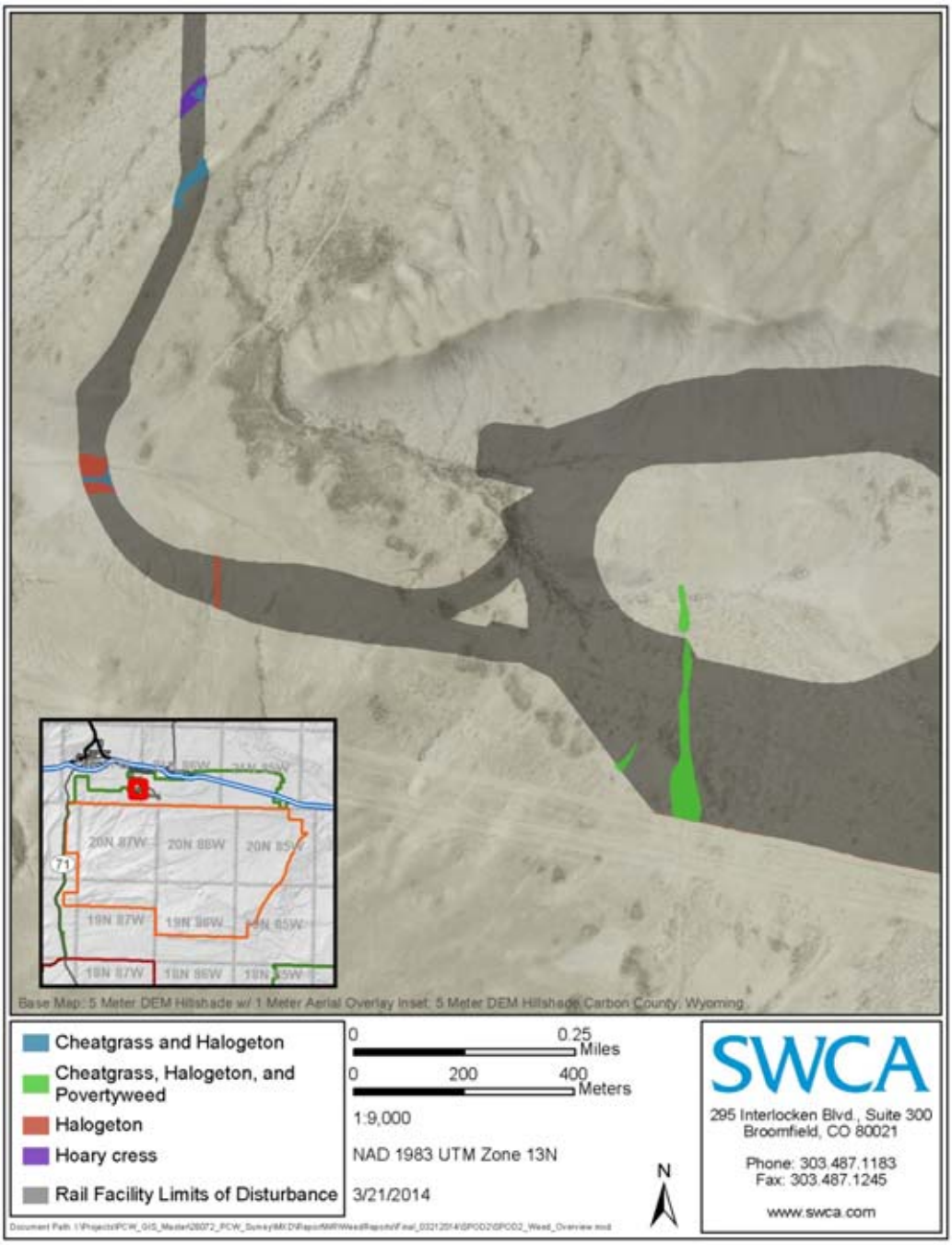

Figure 3. Identified occurrences of halogeton, cheatgrass, and povertyweed along existing roadways and fences in the southern portion of the Rail Facility Site and areas identified for future monitoring for hoarycress and other noxious and invasive species.

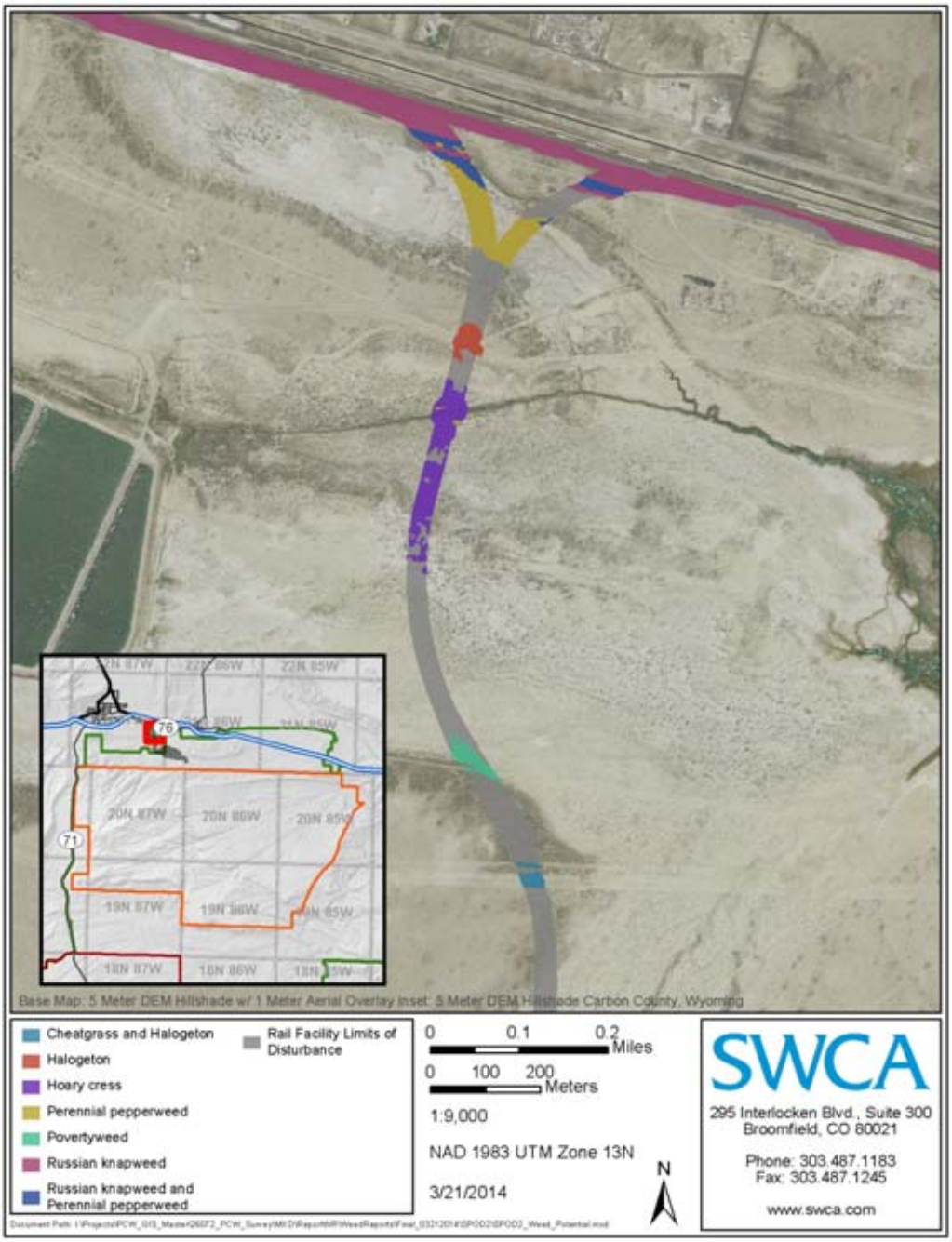

Figure 4. Identified occurrences of halogeton, cheatgrass, Russian knapweed, and povertyweed along existing roadways, railways, pipeline corridors, and drainages in the northern portion of the Rail Facility Site and areas identified for future monitoring for other noxious and invasive species.

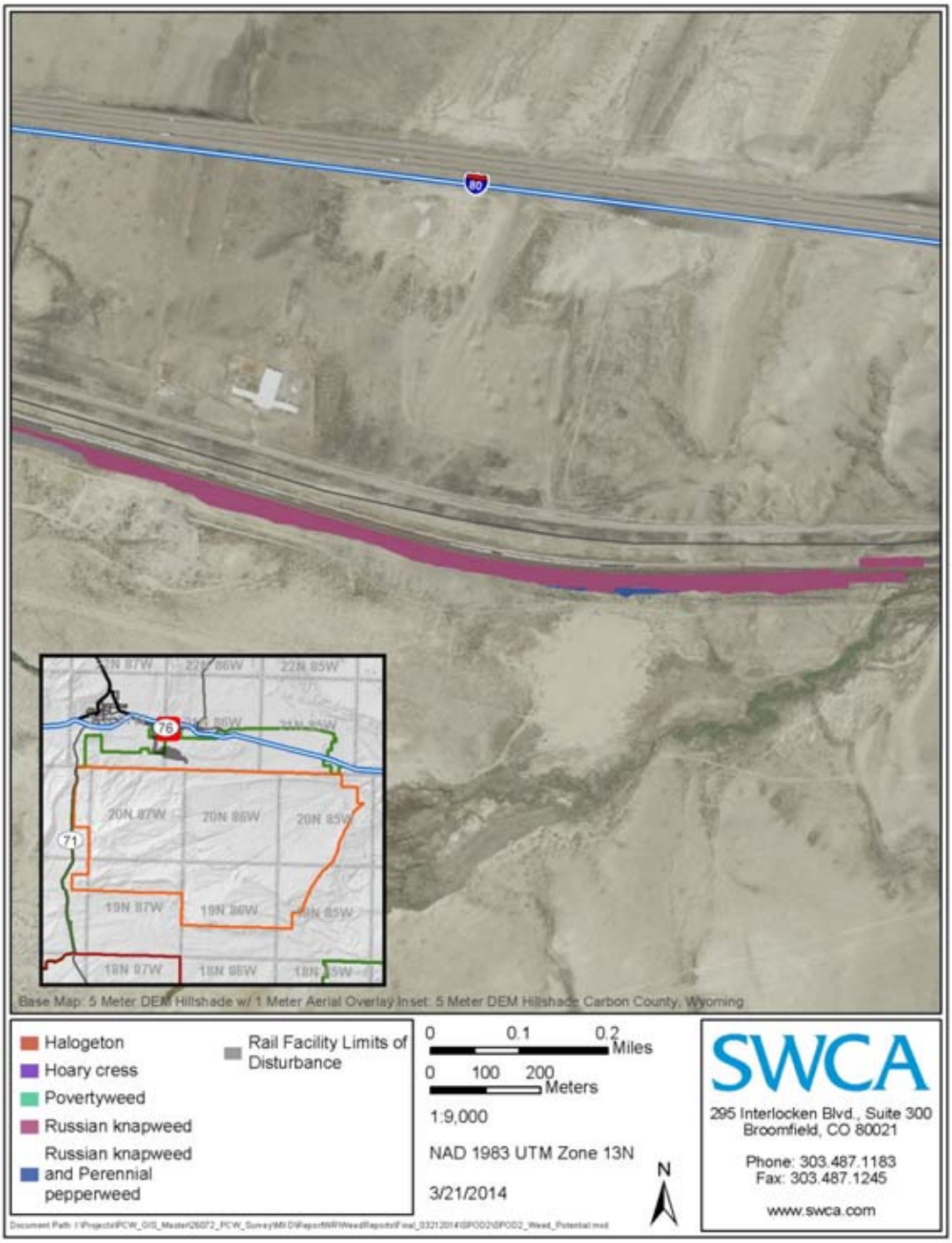

Figure 5. Identified occurrences of halogeton and Russian knapweed along the existing rail corridor in the northern portion of the Rail Facility Site

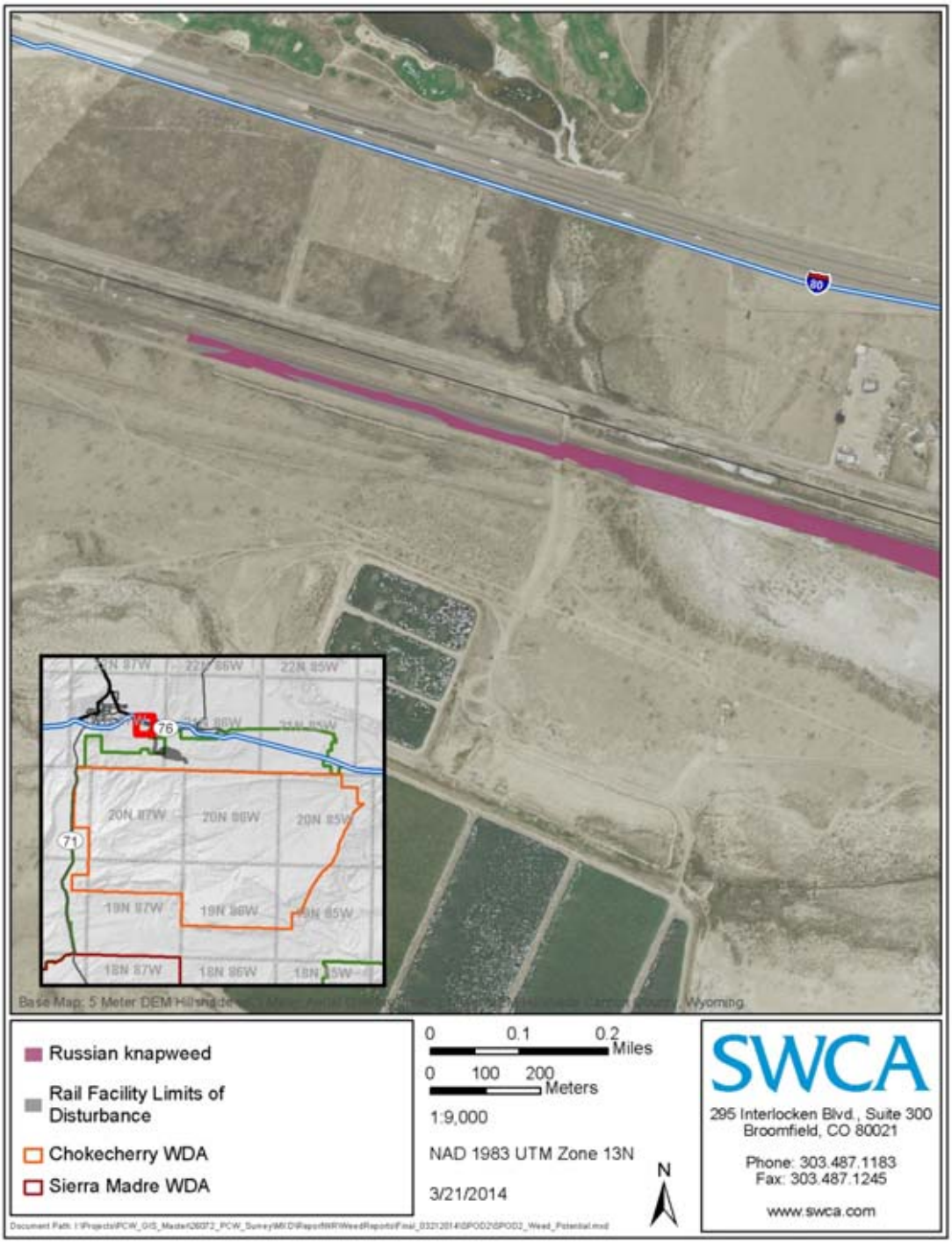

Figure 6. Identified occurrences of Russian knapweed along the existing rail corridor in the northern portion of the Rail Facility Site.

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Noxious Weed Distribution and Control

March 2014

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PURPOSE

The purpose of this document is to identify the current distribution of noxious weed species identified in the CCSM Project Site and to provide management options for the control of these species. Weed management will be in accordance with the site-specific weed management plans. Small infestations will likely be treated locally with herbicide applications appropriate for the specific species. When a large infestation occurs or reoccurs, an evaluation will be performed to determine what led to the infestation, a specific weed control plan will be developed or modified, and a treatment strategy will be implemented.

PCW will implement noxious and invasive weed control measures and BMPs in accordance with existing regulations and jurisdictional land management agency or landowner agreements. PCW will coordinate with appropriate agencies to determine which weed species will require treatment and/or site-specific mitigation approaches. On all BLM-administered lands, PCW will apply for a pesticide use permit (PUP) prior to any herbicide application. Within the CCSM Project Site, noxious and invasive weed control will be conducted using herbicide treatment methods. Treatment methods other than herbicide application, such as cultural, mechanical, biological, and enhancement measures, will be considered during the reclamation process to facilitate noxious weed control

CANADA THISTLE (*CIRSIUM ARVENSE*)

DESCRIPTION AND PHOTOGRAPHS

- Perennial, erect, up to 5 feet tall. Leaves are variable, but typically light to dark green, oblong, deeply cut, and spiny with serrated edge.
- Light lavender to deep purple flowers are in small, bristly clusters in in late spring to early summer.
- Infests disturbed areas in crops, pastures, rangelands, roadsides, and riparian areas.
- Most competitive in deep, well-aerated, productive, cool, moist soils; less common in light, dry soils.
- Horizontal roots may extend over 15 feet; vertical roots may grow 6 to 15 feet deep.
- Emerges from its root system in mid to late spring (late April through May).

Figure 1. Canada Thistle (*Cirsium arvense*)

DAMAGE & THREATS

Canada thistle reduces forage consumption in pastures and rangeland because cattle typically will not graze near infestations (Beck 2008). Infestations throughout the United States cost tens of millions of dollars annually in direct crop losses and control costs (PCA 2005). Canada thistle has the potential to increase fire frequency and severity as a result of its abundant and readily ignited litter (Zouhar 2001). Canada thistle crowds out and replaces native plants, which reduces plant and wildlife diversity in natural areas.

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, Canada thistle occurs in Sage Creek and is primarily found in agricultural improvements, along ditches and surrounding impoundments. This species was also found in ditches, natural drainages, and also along existing roadways within the Chokecherry and Sierra Madre Wind Development Areas (WDAs) (Table 1). Canada thistle was not found to be a common species within the West Sinclair Rail Facility Site and no infestations were delineated. Within the Road Rock Quarry Site, Canada thistle occurs in association with other noxious weed species in the western end of the Road Rock Quarry Site and is primarily found along ditches, surrounding impoundments and natural drainages. Canada thistle was found to occur on Upper and Lower Miller Hill within the Phase I Wind Turbine Development Site and is primarily found in agricultural improvements, along ditches, and existing roadsides (Table 1). Specific locations and maps showing these occurrences are available in the weed survey reports for these sites.

Table 1. Canada Thistle Occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	North Platte River, Sage Creek, and Lower Miller Hill
West Sinclair Rail Facility	None
Road Rock Quarry	Western end of site
Phase I Wind Turbine Development	Upper and Lower Miller Hill

MANAGEMENT OPTIONS

Combining control methods is the best form of Canada thistle management. The key is to stress the plant and force it to use stored root nutrients[7]. Canada thistle can recover from almost any stress because of its root system, so success requires a management plan implemented over several years.

Chemical

Several herbicides are effective against Canada thistle, but retreatment for three or more years may be required (Table 2). Dicamba and chlorsulfuron are more effective when combined with 2,4-D as a split-season application[7]. Apply 2,4-D in spring when Canada thistle is 10 to 15 inches tall, in pre-bud to early bud growth stages, then treat re-growth in fall with dicamba or chlorsulfuron. The tendency of this species to grow in wet areas may restrict the use of certain herbicides. Herbicides are most effective when combined with cultural and/or mechanical control.

Table 2. Herbicides Recommended to Control Canada Thistle.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Picloram	Triumph K Triumph 22K Picloram K Picloram K Picloram 22K Picloram 22K OutPost 22K Tordon K Tordon 22K Trooper 22K Grazon PC	1 qt/acre	Anytime when weeds are rapidly growing	Restricted-use herbicide cannot be used where there is a potential for water contamination
Aminopyralid[2]	Milestone[2]	5-7 oz /acre	Spring at pre-bud growth stage; or fall	Use higher rate for older or dense stands. Can use in areas near/in aquatic sites
Chlorsulfuron[1]	Alligare Chlorsulfuron Telar DF Telar XP NuFarm Chlorsulf SPC 75 WDG Herbicide Chlorsulfuron E-Pro 75 WDG	1.0 oz a.i./acre	Spring bolting to bud growth stages; or fall	Use as follow up on regrowth after 2,4-D treatment. Residual herbicide. Selective, will not harm many grass species. Do not apply near water. Essential to use non-ionic surfactant at 0.25% v/v
Clopyralid	Spur Pyramid R&P Clopyralid 3 Cody Herbicide Reclaim Stinger Transline CleanSlate	0.67 to 1.33 pints/acre	Spring after all shoots have emerged, rosette to early bud growth stages; or fall	Apply 1 pint/acre or more in fall
2,4-D	Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4	2 qt/acre	Spring, in pre-bud to	Selectively controls broadleaf plants. Multiple applications

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Agrisolution 2,4-D LV4 2,4-D Amine 4 2,4-D LV 4 Solve 2,4-D 2,4-D LV 6 Five Star D-638 Alligare 2,4-D Amine 2,4-D LV6 2,4-D Amine 2,4-D Amine 4 Opti-Amine Barrage HF HardBall Unison Clean Amine Low Vol 4 Ester Weed Killer Low Vol 6 Ester Weed Killer Saber Salvo Savage DS Aqua-Kleen Aqua-Kleen Esteron 99C Weedar 64 Weedone LV-4 Weedone LV-4 Solventless Weedone LV-6 Formula 40 2,4-D LV 6 Ester Platoon WEEDstroy AM-40 Hi-Dep 2,4-D Amine Barrage LV Ester 2,4-D LV4 2,4-D LV6 Clean Crop Amine 4 Clean Crop Low Vol 6 Ester Salvo LV Ester 2,4-D 4# Amine Weed Killer Clean Crop LV-4 ES Savage DS Cornbelt 4 lb. Amine Cornbelt 4# LoVol Ester Cornbelt 6# LoVol Ester Amine 4 Lo Vol-4 Lo Vol-6 Ester Base Camp Amine 4 Broadrange 55 Agrisolution 2,4-D LV6		early bud stages	necessary because of resprout. Certain formulations available to use in areas near/in aquatic sites

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4			
Dicamba	Dicamba DMA Vision Cruise Control Banvel Clarity Vision Rifle Banvel Diablo Vanquish Herbicide Vanquish Sterling Blue	2 qts/acre	Spring rosette growth stage; or fall	Use as follow up on regrowth after 2,4-D treatment. Established grass that is growing under stress may be damaged by dicamba

[1]Use a surfactant with Telar® for adequate control (0.25% to 0.5% v/v; equivalent to 1-2 quarts of surfactant per 100 gallons of spray solution.
[2] This herbicide is not approved for use on lands managed by the Bureau of Land Management.
a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Repeated mowing (every three to four weeks throughout the entire growing season) combined with herbicides is effective. Mowing alone will not eradicate an infestation but can reduce infestation density by 50%. Mowing must be repeated – a one-time mowing will stimulate plant growth and increase infestation size and density.

Cultural

Where approved for use by the landowner or land-managing agency, establishment of selected native grasses, crested wheatgrass (*Agropyron cristatum*), or alfalfa (*Medicago sativa*) has been shown to outcompete Canada thistle (CSU 2013). Effective cultural control includes herbicide treatment before seeding as most species are effective competitors only after they are established.

CHEATGRASS OR DOWNY BROME (*BROMUS TECTORUM*)

DESCRIPTION AND PHOTOGRAPHS

- Annual grass, reproduces from seed
- Grass grows up to 30 inches tall
- Soft hairs cover the plant
- Leaves are dark green with hint of purple, but turns yellow to reddish-brown
- The seed head droops, seeds from 2-6" long at maturity including awns that disperse by wind, water, or adhering to clothing or animal's fur.
- widespread in sagebrush steppe communities

Figure 2. Cheatgrass (*Bromus tectorum*)

DAMAGE & THREATS

Cheatgrass has the potential to dramatically alter the ecosystems it invades. Cheatgrass reduces desirable forage plant productivity and diversity of plant species. Cheatgrass is highly flammable. Cheatgrass-fueled wildfires in the west have converted native grasses and sagebrush to low seral cheatgrass-dominated landscapes (Smith and Enloe 2006). Cheatgrass can reduce wildlife habitat, including areas critical for sage grouse.

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Cheatgrass (*Bromus tectorum*) was not found to be a common species within the Phase I Haul Road and Facilities Site and no infestations were delineated. However, cheatgrass was observed outside the Phase I Haul Road and Facilities Site in the Haul Road survey area in a previously disturbed burn or Spike treatment area as the haul road corridor descends south of Hugus Draw off of the Chokecherry WDA area. Cheatgrass was found in the southern portions of the West Sinclair Rail Facility Site and is also known to occur in the pipeline corridor south of the Rail Facility (Table 3). Cheatgrass is found throughout drainage east of the Road Rock Quarry Site on sandier soils. Cheatgrass was delineated in this area extending downstream from a small pond outside the limits of disturbance (LOD) and southeast of the Road Rock Quarry. This species was also noted in several locations throughout the Phase I Wind Turbine Development Site particularly on sandier soils. Cheatgrass was identified along roadsides and in areas recently disturbed by grazing and fire within the Sierra Madre WDA (Table 3). Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 3. Cheatgrass occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	South of Hugus Draw as Road Descends out of Chokecherry WDS
West Sinclair Rail Facility	Southern end of site
Road Rock Quarry	Eastern edge of site
Phase I Wind Turbine Development	Northern portion of Chokecherry WDA

MANAGEMENT OPTIONS

Because cheatgrass is very persistent once it becomes established, eradication of large infestations is not usually a reasonable goal (Zouhar 2003). The extent to which cheatgrass dominates a plant community greatly determines the appropriate suppression strategy, and cheatgrass response to management options is very site specific. Reclamation activities within or adjacent to cheatgrass occurrences should occur as quickly as feasible following initial disturbance to reduce the likelihood of establishment by cheatgrass. Species used for reclamation in and adjacent to cheatgrass occurrences should be selected to maximize likelihood of immediate growth and stabilization to reduce the spread of cheatgrass and other weed species.

Chemical

Chemical control of cheatgrass generally requires a multiple year approach. There are few herbicides that provide effective control. The herbicides in Table 4 are recommended for range and pasturelands.

Mechanical

Mow before seed production (early flowering) to reduce seed numbers then repeat mowing throughout the growing season. This can be nearly as effective as glyphosate7. Summer mowing may facilitate seed dispersal.

Table 4. Herbicides Recommended to Control Cheatgrass.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Imazapic	Panoramic 2SL Plateau	4-8 oz product/acre	Pre or post emergent	Can reseed following application. Sagebrush species display high tolerance at label rates.
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS Glyphosate 5.4 Glyfos Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord SP Accord XRT Accord XRT II Glypro Glypro Plus Rodeo Showdown	6-12 oz/acre	Early spring for suppression	Can be used in reseeding projects

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone Agrisolutions Cornerstone Plus Agrisolutions Rascal Agrisolutions Rascal Plus			
Imazapic + Glyphosate	Journey	16-32 oz/acre	Spring or fall. Fall is ideal.	

Cultural

Where approved for use by the landowner or land-managing agency, drill seeding rangeland after chemical control is an effective control measure (Ponzetti 1997). Control without replacement by desirable perennials will likely result in the reestablishment of cheatgrass or some other undesirable species[4]. Studies in Wyoming have found that Luna pubescent wheatgrass (*Thinopyrum intermedium*), Hycrest crested wheatgrass (*Agropyron cristatum*), and Sodar streambank wheatgrass (*Elymus lanceolatus* ssp. *lanceolatus*) provided significant competition, effectively reducing cheatgrass (Whitson and Koch 1998). Washing of construction equipment that work within cheatgrass occurrences prior to use in other areas will reduce the likelihood of spread.

HALOGETON (*HALOGETON GLOMERATUS*)

DESCRIPTION AND PHOTOGRAPHS

- Annual herbaceous plant, typically 6 to 12 inches tall, with short, fleshy leaves less than half an inch long.
- Plants are bluish-green in spring and early summer, turning yellow, pink, purplish, or even reddish by late summer or early fall. Distinguished by the unique soft, slender spine on leaf tips and tiny, cotton-like hairs in the leaf axils.
- Infests disturbed areas in rangelands, such as livestock bedding or feeding areas, around desert watering sites, and overgrazed areas. Also along roadsides and rail lines, burn areas, and other disturbed sites.
- Found mainly on disturbed, arid sites in saltgrass, salt desert shrub, mixed desert shrub, sagebrush, or pinyon-juniper plant communities.
- Especially abundant in alkaline or saline soils
- Flowers July to September, and reproduces from seeds.

Figure 3. Halogeton (*Halogeton glomeratus*)

DAMAGE & THREATS

Halogeton can displace desirable vegetation, including Gardner saltbush (*Atriplex gardneri*). Halogeton is high in toxins (oxalates) and is a serious health threat to grazing animals, especially sheep. A sheep will be killed by 12 to 18 ounces of halogeton, depending on the amount of other forage consumed (Pavek 1992). Halogeton becomes more toxic as the growing season advances. Livestock readily graze halogeton, but cases of large scale poisoning of cattle are rare compared to sheep. Most losses occur when hungry and thirsty animals are allowed feed in heavy infestations of halogeton (USDA 2006).

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, halogeton occurs along roadsides and areas of recent pipeline development in the northern portion of the site. Small occurrences of this species along roadsides intersecting saline environments were not delineated. Occurrences of halogeton were found throughout the West Sinclair Rail Facility Site associated with ROWs, drainages, roads, and disturbed areas in the site. (Table 5). Within the Road Rock Quarry Site, halogeton occurs in association with other noxious weed species along the eastern edge of the site. Halogeton was found to occur along existing roads throughout the Phase I Wind Turbine Development Site (Table 5). Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 5. Halogeton occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Adjacent to pipeline corridors north of Chokecherry WDA and at Bolten Road crossing
West Sinclair Rail Facility	Throughout the site
Road Rock Quarry	Eastern edge of site
Phase I Wind Turbine Development	Northern Portions of Lower Miller Hill, found incidentally throughout Project site along existing roads.

MANAGEMENT OPTIONS

Plant populations can be controlled by proper use of herbicides, and very small infestations can be eradicated if treated early. Revegetating infested rangelands with more desirable species of perennial grasses is an economical and practical method of controlling the spread of halogeton.

Chemical

Research results indicate that several herbicides are effective for halogeton control (Table 6). The low volatile ester of 2,4-D will kill about 97 to 98 percent of the plants when applied in late May or early June, but is not selective[15]. If other vegetation is depleted, further invasion by halogeton could occur from seed in the soil or other pioneer invaders, such as Russian thistle (*Salsola kali*). Repeated treatments are usually necessary for control. Herbicide control of established stands on saline soils and low precipitation is not recommended.

Table 6. Herbicides Available to Control Halogeton

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Metsulfuron methyl	MSM 60 AmTide MSM 60DF Herbicide Escort DF Escort XP MSM E-Pro 60 EG Herbicide MSM E-AG 60 EG Herbicide Patriot PureStand Metsulfuron Methyl DF	0.45oz. ai/acre	actively growing plants	Residual herbicide. Selective, will not harm many grass species. Use for extensive infestations in pastures and rangeland. Do not apply near water.
2,4-D	Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4 2,4-D Amine 4 2,4-D LV 4 Solve 2,4-D 2,4-D LV 6 Five Star D-638 Alligare 2,4-D Amine 2,4-D LV6 2,4-D Amine 2,4-D Amine 4 Opti-Amine Barrage HF HardBall Unison Clean Amine Low Vol 4 Ester Weed Killer Low Vol 6 Ester Weed Killer	1-2 lb a.e./acre	Preflowering stage, mid-summer	Selectively controls broadleaf plants. Certain formulations available to use in areas near/in aquatic sites. Can use higher rate; however, native plants are Impacted.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Saber Salvo Savage DS Aqua-Kleen Aqua-Kleen Esteron 99C Weedar 64 Weedone LV-4 Weedone LV-4 Solventless Weedone LV-6 Formula 40 2,4-D LV 6 Ester Platoon WEEDstroy AM-40 Hi-Dep 2,4-D Amine Barrage LV Ester 2,4-D LV4 2,4-D LV6 Clean Crop Amine 4 Clean Crop Low Vol 6 Ester Salvo LV Ester 2,4-D 4# Amine Weed Killer Clean Crop LV-4 ES Savage DS Cornbelt 4 lb. Amine Cornbelt 4# LoVol Ester Cornbelt 6# LoVol Ester Amine 4 Lo Vol-4 Lo Vol-6 Ester Base Camp Amine 4 Broadrange 55 Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4			
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS Glyphosate 5.4 Glyfos Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord SP Accord XRT Accord XRT II	2 - 4 lbs a.e./acre Varies by formulation	Emerged plants before the bloom stage.	Nonselective herbicide. Certain formulations available to use in areas near/in aquatic sites. spot treatment on small infestations

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Glypro Glypro Plus Rodeo Showdown Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone Agrisolutions Cornerstone Plus Agrisolutions Rascal Agrisolutions Rascal Plus			

a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Mow or till before flowering stage to prevent seeding. Periodic mowing close to the soil surface can significantly reduce but not completely prevent seed production.

Cultural

Where approved for use by the landowner or land-managing agency, establishing and maintaining competitive perennial vegetation can dramatically slow the introduction and spread of halogeton. Native species options include thickspike wheatgrass (*Elymus lanceolatus*), streambank wheatgrass (*Elymus lanceolatus* ssp.*lanceolatus*), Sandberg bluegrass (*Poa secunda*), slender wheatgrass (*Elymus*

trachycaulus), western wheatgrass (Pascopyrum smithii), bottlebrush squirreltail (*Elymus elymoides*), sand dropseed (*Sporobolus airoides*), saltbush (*Atriplex* sp.) and globemallow species (*Sphaeralcea* sp.) (USDA, NRCS. 2013).

LEAFY SPURGE (*EUPHORBIA ESULA*)

DESCRIPTION AND PHOTOGRAPHS

- A creeping, herbaceous perennial that grows 1 to 3 feet tall. Bluish-green leaves are narrow with smooth margins, one inch to 4 inches long.
- Flowers occur in clusters at the top of stems and are surrounded by yellowish-green showy bracts. Contains white, milky latex in all plant parts.
- Extensive root system is abundant in the top foot of soil and may grow 15 feet deep.
- Shoots originate in early spring from crown tissue just below the soil surface and from buds along the root system. Bracts emerge about two weeks before flowering (primarily April or May) and give leafy spurge the appearance of flowering.
- Tolerates moist to dry soil conditions but is most aggressive under dry conditions where competition from native plants is reduced.
- Invades disturbed sites, including prairies, pastures, abandoned fields, and roadside areas.

Figure 4. Leafy Spurge (*Euphorbia esula*)

DAMAGE & THREATS

Leafy spurge overtakes native vegetation by using available water and nutrients and through plant toxins that prevent the growth of other plants underneath it. It's an aggressive invader that can completely overtake large areas of open land. This weed can reduce rangeland cattle carrying capacity by 50 to 75 percent (CSU 2008); cattle won't graze in dense stands. The latex can cause irritation, blotching, blisters, and swelling in some people.

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, leafy spurge occurs along the Platte River near the water extraction facility (Table 7). Leafy spurge was not found within the West Sinclair Rail Facility, Road Rock Quarry, or Phase I Wind Turbine Development Site. Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 7. Canada thistle occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Near the water extraction point from the Platte River
West Sinclair Rail Facility	None
Road Rock Quarry	None
Phase I Wind Turbine Development	None

MANAGEMENT OPTIONS

Since leafy spurge can recover from almost any control effort, a management strategy that combines multiple control methods over four to five years is recommended.

Chemical

Proper timing of herbicide application is imperative, typically spring with follow-up treatment in the fall (Table 8). Herbicides applied during the hot and dry weeks of summer are less effective because leafy spurge is somewhat dormant. Apply herbicides in spring when true flowers emerge (not just the bracts). Tordon 22K is the most effective herbicide for leafy spurge control (CSU 2008). Tordon 22K applied at 2 quarts per acre annually or every other year can provide good leafy spurge control. Since this treatment is expensive it is generally used to control small or isolated patches. Tordon 22K may be tank-mixed with 2,4-D to provide adequate control at a reduced cost. Multiple treatments are necessary every year for several years. Leafy spurge can re-infest rapidly if left uncontrolled for a single year.

Table 8. Herbicides Available to Control Leafy Spurge (CSU 2008; USDA 2002)

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Picloram	Triumph K Triumph 22K Picloram K Picloram K Picloram 22K Picloram 22K OutPost 22K Tordon K Tordon 22K Trooper 22K Grazon PC	1-2 qt/acre	Spring at flowering growth stage; or to regrowth in fall.	Restricted-use herbicide cannot be used where there is a potential for water contamination.
Picloram + 2,4-D	GunSlinger Picloram + D Picloram + D Tordon 101M Tordon 101 R Forestry Tordon RTU Grazon P+D HiredHand P+D Pathway Trooper 101 Trooper P + D	1-1.5 qts Picloram + 1-1.5 qts of 2,4-D/acre	Spring at flowering growth stage.	Apply for 3-5 consecutive years. Shoot control is generally 80 to 90 percent and cattle will feed in the area again.
Dicamba	Dicamba DMA Vision Cruise Control Banvel Clarity Vision Rifle Banvel Diablo	2 qts/acre	Spring at flowering growth stage; or to regrowth in fall.	Repeat for 3 years to see best results. Established grass that is growing under stress may be damaged by dicamba.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Vanquish Herbicide Vanquish Sterling Blue			
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS Glyphosate 5.4 Glyfos Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord SP Accord XRT Accord XRT II Glypro Glypro Plus Rodeo Showdown Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone	1 qt/acre	First application first of June and second one month later.	Apply sequentially at one month intervals, coupled with fall grass seeding. Selective herbicide. Certain formulations available to use in areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Agrisolutions Cornerstone Plus Agrisolutions Rascal Agrisolutions Rascal Plus			
Glyphosate + 2,4-D	Landmaster BW Campaign Landmaster BW	54 fl. oz/acre	At early seed-set.	Risk of grass injury, especially when applied in the fall. Alternate with Picloram + 2,4-D. Treated areas cannot be grazed or hayed until 8 weeks after treatment.
Imazapic	Panoramic 2SL Plateau	8-12 oz/acre + MSO at 1 quart/acre	Early fall (late-August through October)	Use higher rate for older and dense stands. Use in pastures, rangelands, safe around trees. Apply in fall when milky latex is still present.

a.i. = active ingredient; a.e. = acid equivalent; MSO = methylated seed oil

Mechanical

Mechanical treatment is not recommended for controlling leafy spurge.

Cultural

Vigorous grass growth is important for controlling leafy spurge. Over-grazing stresses grasses and makes them much less competitive with this species. Where available and approved for use by the landowner or land-managing agency, additional irrigation may favor grass growth and make it more competitive with leafy spurge.

MUSK THISTLE (*CARDUUS NUTANS*)

DESCRIPTION AND PHOTOGRAPHS

- Biennial weed that reproduces only from seed.
- Showy red-purple flowers with painful spiny stems and leaves.
- Mature plants range are 1 to 6 feet tall with multi-branched stems. Leaves are dark green coarsely lobed, with a smooth waxy surface and a yellowish to white spine at the tip.
- Large disk-shaped flower heads, 1.5-3.5 inches in length at the tips of stems. Flower heads droop to a 90-degree angle from the stem when mature (also called nodding thistle).
- Invades open natural areas, meadows, prairies, grassy bald, disturbed areas, old pastures, roadsides, waste places, ditch banks, old fields, and hay fields.

Figure 5. Musk thistle (*Carduus nutans*)

DAMAGE & THREATS

One musk thistle plant can set up to 20,000 seeds. This aggressive plant can lead to severe degradation of native grasslands and meadows.

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, Musk thistle occurs in ditches and along roadways of the Sierra Madre WDA (Table 9). Musk thistle was not found to be a common species within the West Sinclair Rail Facility and Road Rock Quarry Sites and no infestations were delineated. Musk thistle was found to occur on lower miller hill within the Phase I Wind Turbine Development Site and is primarily found along existing roadsides (Table 9). Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 9. Musk thistle occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Scattered and isolated occurrences in ditches and along roadways of the Sierra Madre WDA
West Sinclair Rail Facility	None
Road Rock Quarry	None
Phase I Wind Turbine Development	Scattered and isolated occurrences in ditches and along roadways of the Sierra Madre WDA

MANAGEMENT OPTIONS

The key for successful management is to prevent seed production. Herbicides should be applied during the rosette stage or prior to flowering. Manual control is most effective prior to the development of seeds.

Chemical

Several herbicides are registered in pasture, rangeland and noncrop areas to control musk thistle (Table 10). Apply these herbicides in spring or fall to musk thistle rosettes. Applications during the reproductive growth stages with these herbicides (bud through flowering) will not eliminate viable seed development.

Chlorsulfuron or metsulfuron methyl have been shown to prevent or dramatically reduce viable seed formation when applied in spring, up to early flower growth stages (Beck 2008b). The latest time to apply these herbicides is when developed terminal flowers have opened up to the size of a dime.

Table 10. Herbicides Recommended to Control Musk Thistle (Beck 2008b).

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Picloram	Triumph K Triumph 22K Picloram K Picloram K Picloram 22K Picloram 22K OutPost 22K Tordon K Tordon 22K Trooper 22K Grazon PC	0.5-1 pt/acre	Spring at rosette growth stage; or in fall	Use higher rate for older or dense stands. Restricted-use herbicide cannot be used where there is a potential for water contamination
Aminopyralid[2]	Milestone[2]	3-5 fl oz /acre	Spring at rosette growth stage; or in fall	Use higher rate for older or dense stands. Can use in areas near/in aquatic sites.
Chlorsulfuron[1]	Alligare Chlorsulfuron Telar DF Telar XP NuFarm Chlorsulf SPC 75 WDG Herbicide Chlorsulfuron E-Pro 75 WDG	0.5 oz/acre	Spring at rosette growth stage; or in fall to rosettes	use non-ionic surfactant at 0.25% v/v.
Metsulfuron methyl	MSM 60 AmTide MSM 60DF Herbicide Escort DF Escort XP MSM E-Pro 60 EG Herbicide MSM E-AG 60 EG Herbicide Patriot PureStand Metsulfuron Methyl DF	0.5 oz/acre	Spring at rosette growth stage; or in fall to rosettes	use non-ionic surfactant at 0.25% v/v.
Clopyralid	Spur Pyramid R&P Clopyralid 3 Cody Herbicide Reclaim Stinger Transline CleanSlate	0.67 to 1.33 pints/acre	Spring at rosette growth stage; or in fall	Use higher rate for older or dense stands.
Dicamba	Dicamba DMA Vision Cruise Control Banvel	1-2 pts/acre	Spring at rosette growth stage; or in fall	Can add 2,4-D . Use higher rate for older or dense stands.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Clarity Vision Rifle Banvel Diablo Vanquish Herbicide Vanquish Sterling Blue			

[1]Use 1 quart of surfactant per 100 gallons of spray solution.
[2] This herbicide is not approved for use on lands managed by the Bureau of Land Management.
a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Musk thistle will not tolerate tillage and can be removed easily by severing its root below ground with a shovel. Mowing can effectively reduce seed output if plants are cut when the terminal head is in the late-flowering stage, prior to development of seeds (Beck 2008, USFS 2005). Mowed debris can be gathered and burned to destroy any seed that has developed.

Cultural

Where approved for use by the landowner or land-managing agency, cultural methods can help effectively control musk thistle. Rotational grazing can favor pasture and rangeland grass growth, which can outcompete musk thistle.

PERENNIAL PEPPERWEED (*LEPIDIUM LATIFOLIUM*)

DESCRIPTION AND PHOTOGRAPHS

- Multiple stems grow in stiff, erect masses that can reach eight feet in height, but are typically 2 to 4 feet.
- Leaves are bright green to grayish-green and lance-shaped. Lower leaves can be up to 1 foot long and 3 inches wide and are toothed along the edges. Leaves get smaller and less serraded towards the top of the stem.
- Flowers are small, white, 4-petaled and borne in dense clusters near the end of the stems.
- Deep, extensive root system capable of generating new shoots.
- Flowering occurs from early summer into fall. Seeds remain on the plant throughout the winter and drop at irregular intervals.
- Common problem in flood plains, irrigation structures, pastures, hay meadows, cropland, wetlands, riparian areas, roadsides, and residential sites.

Figure 6. Perennial Pepperweed (*Lepidium latifolium*)

DAMAGE & THREATS

Perennial pepperweed rapidly forms large, dense stands that displace desirable vegetation. Populations spread along waterways and can infest entire stream corridors, riparian areas, or irrigation structures. It can inhibit growth of vital trees along waterways such as cottonwood and willow. Once established, perennial pepperweed is persistent and difficult to control in crops, natural areas, and ornamental plantings. This species reduces forage quality in hay or pasture and is toxic to livestock (MWCA 2009).

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Perennial pepperweed was not found to be a common species within the CCSM Project Site. Within the Phase I Haul Road and Facilities Site, perennial pepperweed occurs along Little Sage Creek (Table 11). Perennial pepperweed occurs in the northern end of the West Sinclair Rail Facility Site near the existing rail corridor and is primarily found scattered along ditches and natural drainages in association with other plant species. Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 11. Perennial pepperweed occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Little Sage Creek crossing
West Sinclair Rail Facility	Northern end of site adjacent to Union Pacific rail
Road Rock Quarry	None
Phase I Wind Turbine Development	None

MANAGEMENT OPTIONS

Containment of new infestations is critical. The most effective method of containment is to spray borders of the infested areas with a herbicide (Kruger and Sheley 1999). Control is difficult once perennial pepperweed is established because the plant is so competitive and spreads rapidly by its creeping roots.

Chemical

Several post-emergent herbicides control perennial pepperweed, but applications should be repeated for several years to treat resprouting shoots and seedlings (Table 12). Chemical control can be enhanced by establishing competitive vegetation at the site. In areas with a dense thatch buildup, mow old shoots before applying herbicides. Herbicides work best when applied at the flower bud stage. If herbicide cannot be applied at the flower bud to flowering stages, mow plants and treat re-sprouting shoots. Chemical control of perennial pepperweed on non-cropland is best achieved by using chlorsulfuron or metsulfuron methyl, but cannot be used near water.

Table 12. Herbicides Available to Control Perennial Pepperweed (Wilson, et.al. 2004)

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Chlorsulfuron[1]	Alligare Chlorsulfuron Telar DF Telar XP NuFarm Chlorsulf SPC 75 WDG Herbicide Chlorsulfuron E-Pro 75 WDG	0.75-1.5 oz a.i/acre	Flowerbud to flowering, or fall if green tissue is present.	Residual herbicide. Selective, will not harm many grass species. Do not apply near water.
Metsulfuron methyl	MSM 60 AmTide MSM 60DF Herbicide Escort DF Escort XP MSM E-Pro 60 EG Herbicide MSM E-AG 60 EG Herbicide Patriot PureStand Metsulfuron Methyl DF	0.45-0.60 oz. ai/acre	Flowerbud to flowering, or fall if green tissue is present.	Residual herbicide. Selective, will not harm many grass species. Do not apply near water.
2,4-D	Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4 2,4-D Amine 4 2,4-D LV 4 Solve 2,4-D 2,4-D LV 6 Five Star D-638 Alligare 2,4-D Amine 2,4-D LV6 2,4-D Amine 2,4-D Amine 4	1 - 2 lb a.e./acre	Anytime actively growing, best results at flowerbud to flowering.	Selectively controls broadleaf plants. Multiple applications necessary because of resprout. Certain formulations available to use in areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Opti-Amine Barrage HF HardBall Unison Clean Amine Low Vol 4 Ester Weed Killer Low Vol 6 Ester Weed Killer Saber Salvo Savage DS Aqua-Kleen Aqua-Kleen Esteron 99C Weedar 64 Weedone LV-4 Weedone LV-4 Solventless Weedone LV-6 Formula 40 2,4-D LV 6 Ester Platoon WEEDstroy AM-40 Hi-Dep 2,4-D Amine Barrage LV Ester 2,4-D LV4 2,4-D LV6 Clean Crop Amine 4 Clean Crop Low Vol 6 Ester Salvo LV Ester 2,4-D 4# Amine Weed Killer Clean Crop LV-4 ES Savage DS Cornbelt 4 lb. Amine Cornbelt 4# LoVol Ester Cornbelt 6# LoVol Ester Amine 4 Lo Vol-4 Lo Vol-6 Ester Base Camp Amine 4 Broadrange 55 Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4			
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS Glyphosate 5.4 Glyfos	2 - 4 lbs a.e./acre Varies by formulation.	Mow plants when bolting and apply to resprouting foliage.	Nonselective herbicide. Certain formulations available to use in areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord SP Accord XRT Accord XRT II Glypro Glypro Plus Rodeo Showdown Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone Agrisolutions Cornerstone Plus Agrisolutions Rascal Agrisolutions Rascal Plus			
Imazapyr	Imazapyr 2SL Imazapyr 4SL Ecomazapyr 2SL Arsenal Railroad Herbicide Chopper Arsenal Applicators Conc. Arsenal Arsenal PowerLine	2 - 6 oz a.e./acre	Anytime actively growing, best results at flowerbud to flowering.	Residual herbicide, nonselective. Good for fence rows and highway rights-of-way. Do not use in rangeland or pasture. Use Habitat for areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Stalker Habitat Polaris Polaris AC Polaris AC Polaris AQ Polaris RR Polaris SP Polaris SP Polaris Herbicide Habitat Herbicide SSI Maxim Arsenal 0.5G Ecomazapyr 2 SL Imazapyr 2 SL Imazapyr 4 SL			

a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Mowing breaks old stems into small fragments and helps prevent shading of favorable species; however, mowing also stimulates plants to resprout and produce new growth. Combining mowing with herbicides has been shown to be an effective control strategy. Mow plants at the bolting or flower bud stage and apply herbicides to resprouting shoots once they have reached the flower bud stage.

Cultural

Where approved for use by the landowner or land-managing agency, establishing and maintaining competitive perennial vegetation can dramatically slow the introduction and spread of perennial pepperweed. Vigorous sod-forming grasses, alfalfa (*Medicago sativa*), or cropping systems with annual tillage can help prevent pepperweed introduction and establishment in agricultural areas.

POVERTY WEED (*IVA AXILLARIS*)

DESCRIPTION AND PHOTOGRAPHS

- Perennial, erect, with 6 inches to 2 feet tall leafy branches.
- Leaves are narrowly oblong, 0.5-2 inches long, rough, fleshy.
- Numerous greenish flower heads on stem, nodding.
- Infests cultivated crops, grain fields, meadows, and waste places
- Unpleasant odor, disliked by grazing animals
- Extensive, woody root system forms dense patches.
- Blooms May - September

Figure 7. Poverty weed (*Iva axillaris*)

DAMAGE & THREATS

Poverty weed can become highly competitive when established in agricultural fields and may significantly reduce crop yields. Heavily infested rangeland areas have little grazing value due to the low palatability of the plant. Some report that poverty weed is a selenium accumulator and may be toxic to livestock when ingested; however, this is rare due to the unpalatable nature of the plant. Poverty weed pollen is highly allergenic and plants may cause contact dermatitis in sensitive individuals (CDFA 2014).

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, poverty weed was not found to be a common species and no infestations were delineated (Table 13) although scattered occurrence of poverty weed was noted near the North Platte River water extraction site. Poverty weed was documented associated with a black greasewood (*Sarcobatus vermiculatus*)/inland saltgrass (*Distichlis spicata*) shrubland during wetland delineations within the West Sinclair Rail Facility Site. Within the Road Rock Quarry Site, poverty weed occurs in association with other noxious weed species on the southeastern corner of the site (Table 13) next to a small pond. Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 13. Poverty weed occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	None
West Sinclair Rail Facility	Associated with a black greasewood /inland saltgrass shrubland
Road Rock Quarry	Southeast of Quarry location next to small impoundment
Phase I Wind Turbine Development	None

MANAGEMENT OPTIONS

Poverty weed is generally very difficult to control due to a deep root system with high-energy reserves (CDFA 2014). Only a limited number of effective chemical options are available (Table 14).

Chemical

Research from Canada has shown 2,4-D applied at 2 lb ae/acre over a five year period was highly effective at controlling poverty weed (Best 1975). Picloram applied at 0.75 lb ae/acre was also found to be effective (Best 1975). Research from Australia has shown that high volume spot applications of 0.3% v/v clopyralid, 0.2% v/v picloram + 0.8% v/v 2,4-D were effective for short-term control. Extended control for 1 or 2 years and a very high level of control for 3 years was obtained with 0.1% v/v picloram + 0.4% v/v 2,4-D, 0.8% v/v dicamba, and 0.72% v/v glyphosate applied to each plant until the leaf surface is visibly wet (spray-to-wet method).

Table 14. Herbicides Recommended to Control Poverty weed.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
2,4-D	Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4 2,4-D Amine 4 2,4-D LV 4 Solve 2,4-D 2,4-D LV 6 Five Star D-638 Alligare 2,4-D Amine 2,4-D LV6 2,4-D Amine 2,4-D Amine 4 Opti-Amine Barrage HF HardBall Unison Clean Amine Low Vol 4 Ester Weed Killer Low Vol 6 Ester Weed Killer Saber Salvo Savage DS Aqua-Kleen Aqua-Kleen Esteron 99C Weedar 64 Weedone LV-4 Weedone LV-4 Solventless Weedone LV-6 Formula 40 2,4-D LV 6 Ester	2 lb a.e/acre	Spring, in pre-bud to early bud stages.	Selectively controls broadleaf plants. Multiple applications necessary because of resprout. Certain formulations available to use in areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Platoon WEEDstroy AM-40 Hi-Dep 2,4-D Amine Barrage LV Ester 2,4-D LV4 2,4-D LV6 Clean Crop Amine 4 Clean Crop Low Vol 6 Ester Salvo LV Ester 2,4-D 4# Amine Weed Killer Clean Crop LV-4 ES Savage DS Cornbelt 4 lb. Amine Cornbelt 4# LoVol Ester Cornbelt 6# LoVol Ester Amine 4 Lo Vol-4 Lo Vol-6 Ester Base Camp Amine 4 Broadrange 55 Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4			
Picloram	Triumph K Triumph 22K Picloram K Picloram K Picloram 22K OutPost 22K Tordon K Tordon 22K Trooper 22K Grazon PC	0.75 lb a.e./acre	Anytime when weeds are rapidly growing.	Restricted-use herbicide cannot be used where there is a potential for water contamination.
Picloram + 2,4-D	GunSlinger Picloram + D Picloram + D Tordon 101M Tordon 101 R Forestry Tordon RTU Grazon P+D HiredHand P+D Pathway Trooper 101 Trooper P + D	0.1% v/v picloram + 0.4% v/v 2,4-D	Spring after all shoots have emerged, rosette to early bud growth stages; or fall	Restricted-use herbicide cannot be used where there is a potential for water contamination.
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS	0.72% v/v	Early spring for suppression	Can be used in reseeding projects

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Glyphosate 5.4 Glyfos Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord XRT Accord XRT II Glypro Glypro Plus Rodeo Showdown Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone Agrisolutions Rascal Agrisolutions Rascal Plus			
Dicamba	Dicamba DMA Vision Cruise Control Banvel Clarity Vision Rifle Banvel Diablo Vanquish Herbicide	0.8% v/v	Spring growth stage; or fall	Use as follow up on regrowth after 2,4-D treatment. Established grass that is growing under stress may be damaged by dicamba.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Sterling Blue			

a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Intensive tillage over a three-year period failed to effectively control poverty weed and is not recommended[3]. Hand pulling is very difficult and must be repeated as new shoots emerge. Gloves and long sleeves should be worn due to the irritating properties of the foliage. Controlled burning is not expected to be effective for management since poverty weed is a deep-rooted perennial and a natural component of many grassland communities that experience periodic fire. There is little research on mowing, but regrowth is likely to occur with no long-term damage to the plant[3].

Cultural

Where approved for use by the landowner or land-managing agency, alternating wheat with summer fallow or growing perennial hay crops such as alfalfa (*Medicago sativa*) can help suppress infestations. Managing pastures to prevent overgrazing also helps to suppress colonization of poverty weed[3].

RUSSIAN KNAPWEED (*ACROPTILON REPENS*)

DESCRIPTION AND PHOTOGRAPHS

- Stems are erect, 18 to 36 inches tall, with many branches. Lower leaves are 2-4 inches long and deeply lobed; upper leaves are smaller with smooth margins. Shoots and leaves are covered with dense gray hairs.
- Flowers are urn-shaped, solitary, and composed of pink, lavender or white disk flowers.
- Infests cultivated land, dry pastures, roadsides, and rangeland.
- Emerges in early spring, bolts in May to June (elevation dependent) and flowers through the summer into fall.

Figure 8. Russian Knapweed (*Acroptilon repens*)

DAMAGE & THREATS

Russian knapweed crowds out and replaces native plants, reduces plant and animal diversity, harmful impacts to native species and natural ecosystems. This weed is toxic to horses (Beck 2008c), reduces forage for livestock, and reduces biodiversity for wildlife habitat (Zouhar 2001b).

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Russian knapweed occurs scattered in ditches, natural drainages, and also along existing roadways throughout the Phase I Haul Road and Facilities Site (Table 15). Within the West Sinclair Rail Facility Site, Russian knapweed was found along the Union Pacific railroad corridor consistent with BLM datasets. Russian knapweed was not found to be a common species within the Road Rock Quarry Site and no infestations were identified. Russian knapweed locations elsewhere primarily occur in agricultural areas, along ditches, and existing roadsides (Table 15). Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 15. Russian knapweed occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Scattered in small patches throughout the site in roadways and drainages
West Sinclair Rail Facility	Northern end of the site along the Union Pacific rail
Road Rock Quarry	None
Phase I Wind Turbine Development	None

MANAGEMENT OPTIONS

Combining control methods is the best form of Russian knapweed management. A single control strategy, such as mowing or an herbicide, usually is not sufficient. The key is to stress the plant and force it to use stored root nutrients . The best way to control Russian knapweed is to combine herbicide treatment with seeding competitive grasses. Treatments should be repeated for several years.

Chemical

Russian knapweed is controlled by picloram, aminopyralid, clopyralid, clopyralid + 2,4-D, and chlorsulfuron (Table 16). Russian knapweed is very susceptible to fall-applied herbicides due to active root bud growth and development (Beck 2008c; Zouhar 2001b).

Table 16. Herbicides Available to Control Russian Knapweed (Beck 2008c)

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
Picloram	Triumph K Triumph 22K Picloram K Picloram K Picloram 22K Picloram 22K OutPost 22K Tordon K Tordon 22K Trooper 22K Grazon PC	2 to 4 pints/acre	Spring at bud to mid-flowering growth stages; or late in fall.	Restricted-use herbicide cannot be used where there is a potential for water contamination.
Aminopyralid[2]	Milestone[2]	4 to 6 oz /acre	Spring and summer at bud to flowering growth stages; or late in fall.	Use higher rate for older or dense stands. Fall treatments to dormant plants are effective. Can use in areas near/in aquatic sites.
Chlorsulfuron[1]	Alligare Chlorsulfuron Telar DF Telar XP NuFarm Chlorsulf SPC 75 WDG Herbicide Chlorsulfuron E-Pro 75 WDG	1.0 oz a.i./acre	Spring bud to flowering growth stage; or late in fall.	Residual herbicide. Selective, will not harm many grass species. Do not apply near water.
Clopyralid	Spur Pyramid R&P Clopyralid 3 Cody Herbicide Reclaim Stinger Transline CleanSlate	1 to 1.33 pints	Spring after all shoot have emerged, bud to mid-flower growth stages; late in or fall.	Use higher rate for older or dense stands. Fall treatments to dormant plants are effective
Clopyralid + 2,4-D	Commando Curtail Cutback	3-4 qts/acre	Spring after all shoots have emerged, bud to mid-flower growth stages; late in or fall.	Use higher rate for older or dense; late treatments in fall to dormant plants very effective

[1]Use a surfactant with Telar® for adequate control (0.25% to 0.5% v/v; equivalent to 1-2 quarts of surfactant per 100 gallons of spray solution.
[2] This herbicide is not approved for use on lands managed by the Bureau of Land Management.
a.i. = active ingredient; a.e. = acid equivalent

Mechanical

A combination of cutting (or mowing) and herbicides can be used to control Russian knapweed; cutting alone will not eliminate new growth. Cutting several times (spring, summer, fall) stresses Russian knapweed plants and forces them to use nutrient reserves stored in the root system[4]. Follow up with an herbicide application in the fall.

Cultural

Where approved for use by the landowner or land-managing agency, sow streambank wheatgrass (*Elymus lanceolatus* ssp. *lanceolatus*), thickspike wheatgrass (*Elymus lanceolatus*), crested wheatgrass (*Agropyron cristatum*) and Russian wildrye (*Psathyrostachys juncea*) after Russian knapweed is suppressed with herbicides[3]. Sod-forming perennial grasses, like streambank or thickspike wheatgrasses, help prevent reinvasion better than bunch grasses like crested wheatgrass.

WHITETOP OR HOARY CRESS (*CARDARIA DRABA*)

DESCRIPTION AND PHOTOGRAPHS

- A creeping perennial that grows 10 to 18 inches tall. Leaves are 0.5 to 2 inches long with blunt ends. Leaves and stems have a grayish- green color and leaves are soft and covered in fine hairs.
- Numerous white flowers with four petals, give the plant a white, flat-topped appearance.
- Flowers from May to June; seed sets in mid-summer.
- Typically found on generally open, unshaded, disturbed ground. Widespread in fields, waste places, meadows, pastures, croplands, and along roadsides
- Grows well on alkaline soils that are wet in late spring, generally prefers areas with moderate amounts of rainfall.
- Commonly found in saltcedar (*Tamarix* spp.), antelope bitterbrush / rough fescue (*Purshia tridentata* / *Festuca scabrella*), antelope bitterbrush / bluebunch wheatgrass (*Pseudoroegneria spicata*), big sagebrush (*Artemisia tridentata* spp.), and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) communities (Colorado State Parks 2005).

Figure 9. Whitetop (*Cardaria draba*)

DAMAGE & THREATS

Whitetop is highly competitive, once established, spreading primarily by extremely persistent roots and will eventually eliminate desirable vegetation and become a monoculture. This weed invades rangelands and is generally unpalatable.

CURRENT DISTRIBUTION

Surveys were conducted within the CCSM Phase I disturbance areas as well as a 100 foot minimum buffer surrounding all planned disturbances. During survey efforts, biologists recorded any occurrences of noxious and invasive weed species encountered. Any new infestations observed during construction or reclamation will be recorded and monitored.

Within the Phase I Haul Road and Facilities Site, whitetop occurs throughout the site and is primarily found associated with ditches natural drainages (Table 17). Whitetop was found to occur within a drainage in the central area of the West Sinclair Rail Facility Site. Within the Road Rock Quarry and Phase I Wind Turbine Development Sites, whitetop was not found to be a common species and no infestations were delineated (Table 17). Specific locations and maps showing these occurrences are available in the respective weed survey reports for these sites.

Table 17. Whitetop occurrences.

Project Site	Locations
Phase I Haul Road and Facilities	Potential in drainages throughout the site
West Sinclair Rail Facility	Areas adjacent to Sugar Creek
Road Rock Quarry	None
Phase I Wind Turbine Development	None

MANAGEMENT OPTIONS

Control of whitetop is difficult because of the perennial root system, abundant seed production, and diverse habitats invaded by the plant. Containing existing weed infestations by annual border spraying of the outside perimeter of the infestation is important to prevent spread.

Chemical

Herbicides are effective in suppressing or controlling new infestations of hoary cress (Table 18). On large, well established infestations, herbicides should be combined with management methods that increase desirable competitive vegetation to achieve long-term control. Metsulfuron methyl or chlorsulfuron provide the most effective hoary cress control on range, pasture, wildland, and rights-of-way sites (Duncan and Ranz 2010). Successful control usually depends on an aggressive reapplication program.

Table 18. Herbicides Available to Control Whitetop[4]

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
2,4-D	Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4 2,4-D Amine 4 2,4-D LV 4 Solve 2,4-D 2,4-D LV 6 Five Star D-638 Alligare 2,4-D Amine 2,4-D LV6 2,4-D Amine 2,4-D Amine 4 Opti-Amine Barrage HF HardBall Unison Clean Amine Low Vol 4 Ester Weed Killer Low Vol 6 Ester Weed Killer Saber Salvo Savage DS Aqua-Kleen Aqua-Kleen Esteron 99C Weedar 64 Weedone LV-4 Weedone LV-4 Solventless Weedone LV-6 Formula 40 2,4-D LV 6 Ester Platoon WEEDstroy AM-40 Hi-Dep 2,4-D Amine Barrage LV Ester 2,4-D LV4 2,4-D LV6	1 - 2 lb a.i./acre	Bolting to budding stages.	Selectively controls broadleaf plants, will not harm grass. Apply annually for at least 2years to reduce density.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Clean Crop Amine 4 Clean Crop Low Vol 6 Ester Salvo LV Ester 2,4-D 4# Amine Weed Killer Clean Crop LV-4 ES Savage DS Cornbelt 4 lb. Amine Cornbelt 4# LoVol Ester Cornbelt 6# LoVol Ester Amine 4 Lo Vol-4 Lo Vol-6 Ester Base Camp Amine 4 Broadrange 55 Agrisolution 2,4-D LV6 Agrisolution 2,4-D Amine 4 Agrisolution 2,4-D LV4			
Imazapic	Panoramic 2SL Plateau	8-12 oz/acre + MSO at 1 quart/acre	Full bloom or fall to rosettes	
Glyphosate	Aqua Star Forest Star GlyStar Gold Gly Star Original Gly Star Plus Gly Star Pro Glyphosate 4 PLUS Glyphosate 5.4 Glyfos Glyfos PRO Glyfos Aquatic ClearOut 41 Plus Accord Concentrate Accord SP Accord XRT Accord XRT II Glypro Glypro Plus Rodeo Showdown Mirage Mirage Plus Aquamaster Roundup Original Roundup Original II Roundup Original II CA Honcho Honcho Plus Roundup PRO Roundup PRO Concentrate Roundup PRO Dry Roundup PROMAX	2-3 lbs a.e./acre	Bolt growth stage.	Certain formulations available to use in areas near/in aquatic sites.

Active Ingredient	Trade Names	Application Rate	Application Timing	Notes
	Aqua Neat Credit Xtreme Foresters Razor Razor Pro GlyphoMate 41 AquaPro Aquatic Herbicide Rattler Buccaneer Buccaneer Plus Mirage Herbicide Mirage Plus Herbicide Gly-4 Plus Gly-4 Plus Gly-4 Glyphosate 4 Agrisolutions Cornerstone Agrisolutions Cornerstone Plus Agrisolutions Rascal Agrisolutions Rascal Plus			
Metsulfuron methyl	MSM 60 AmTide MSM 60DF Herbicide Escort DF Escort XP MSM E-Pro 60 EG Herbicide MSM E-AG 60 EG Herbicide Patriot PureStand Metsulfuron Methyl DF	0.5-1 oz. ai/acre+ non-ionic surfactant at 0.25% V/V	Early in the spring, to regrowth before bud stage, or to fall regrowth.	Residual herbicide. Selective, will not harm many grass species. Do not apply near water.
Chlorsulfuron	Alligare Chlorsulfuron Telar DF Telar XP NuFarm Chlorsulf SPC 75 WDG Herbicide Chlorsulfuron E-Pro 75 WDG	1.0-1.5 oz a.i/acre+ non-ionic surfactant at 0.25% V/V	Pre-bloom to bloom; or fall	Residual herbicide. Selective, will not harm many grass species. Do not apply near water.

a.i. = active ingredient; a.e. = acid equivalent

Mechanical

Mowing alone will not effectively control whitetop and may injure desirable vegetation. Mowing to ground level at the early flower growth stage may reduce stem density and the number of seeds produced, but does not provide long-term control. Repeat mowing when the plants re-bud. Mowing integrated with an appropriate herbicide about a month later can be effective.

Cultural

Where approved for use by the landowner or land-managing agency, the effectiveness of a mowing program can be increased by planting perennial grasses as competitors.

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Attachment C

Pesticide Use Proposal Form

March 2014

UNITED STATE DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

PESTICIDE USE PROPOSAL

STATE:
COUNTY:
FIELD OFFICE:
DURATION OF PROPOSAL:

DATE:
PROPOSAL NUMBER:
EA REFERENCE NUMBER:
DECISION RECORD (DR) NUMBER:

LOCATION:

ORIGINATOR – NAME:
ORIGINATOR – COMPANY:
ORIGINATOR – CONTACT INFORMATION:

I. APPLICATION INFORMATION – (Including mixtures and adjuvants):

1. TRADE NAME(S):
2. COMMON NAME(S):
3. EPA REGISTRATION NUMBER(S):
4. MANUFACTURER(S):
5. METHOD OF APPLICATION:
6. MAXIMUM RATE OF APPLICATION – AS STATED ON THE LABEL:
    a. Formulated Product:
    b. Pounds Active Ingredient or Acid Equivalent:
7. INTENDED RATE OF APPPLICATION:
    a. Formulated product:
    b. Pounds Active Ingredient or Acid Equivalent:
8. APPLICATION DATE(S):
9. NUMBER OF APPLICATIONS:

II. PEST [List specific pest(s) and reason(s) for the proposed application of the pesticide]:

III. DESIRED RESULTS OF THE APPLICATION – LINKED TO THE OBJECTIVES OF THE APPLICATION:

IV. APPLICATION SITE DESCRIPTION:

1. ESTIMATED NUMBER OF ACRES:
2. GENERAL DESCRIPTION (Describe land type or use, size, stage of growth of target species, soil characteristics, and any additional information that may be important in describing the area to be treated.)

V. SENSITIVE ASPECTS AND PRECAUTIONS (Describe sensitive areas – marsh, endangered, threatened, candidate, and sensitive species habitat – and distance to application site. List measures to be taken to avoid impact to these areas):

VI. NON-TARGET VEGETATION (Describe potential immediate and cumulative impacts to non-target pests in Project area as a result of the pesticide application. Identify any planned mitigation measures that will be employed – BE GENERAL, SPECIFICS DISCUSSED IN THE EA):

VII. INTEGRATED PEST MANAGEMENT PRACTICES CONSIDERED IN THE OVERALL PROJECT:

VIII. SIGNATURES:

1. Pesticide Use Proposal's Originator: _____ Date:_____
   a. Company: _____
2. Certified Pesticide Applicator: _____ Date:_____
   a. Printed Name: _____
   b. Address: _____
   c. License Number: _____
   d. Certifying Organization: _____

3. Field Office Weed and Pest Coordinator: _____ Date: _____

4. Field Office Manager: _____ Date:_____

5. BLM State Weed and Pest Coordinator: _____ Date:_____

6. Deputy State Director: _____ Date:_____
   - Concur or Approved
   - Not Concur or Disapproved
   - Concur or Approved With Modifications

     - Any changes (modifications) to this proposal by the state pesticide Coordinator will be listed below or in an attached memo to the manager requesting approval from the Deputy State Director

APPENDIX K

Chokecherry and Sierra Madre Wind Energy Project
Aquatic Resources Inventory Report

West Sinclair Rail Facility

Prepared for

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August 2013
(Updated March 2014)

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. This Aquatic Resources Inventory Report addresses the West Sinclair Rail Facility (Rail Facility), an integral part of the CCSM Project. The Rail Facility connects the CCSM Project to the existing Union Pacific Railroad located south of Interstate 80 along the northern boundary of the CCSM Project Site.

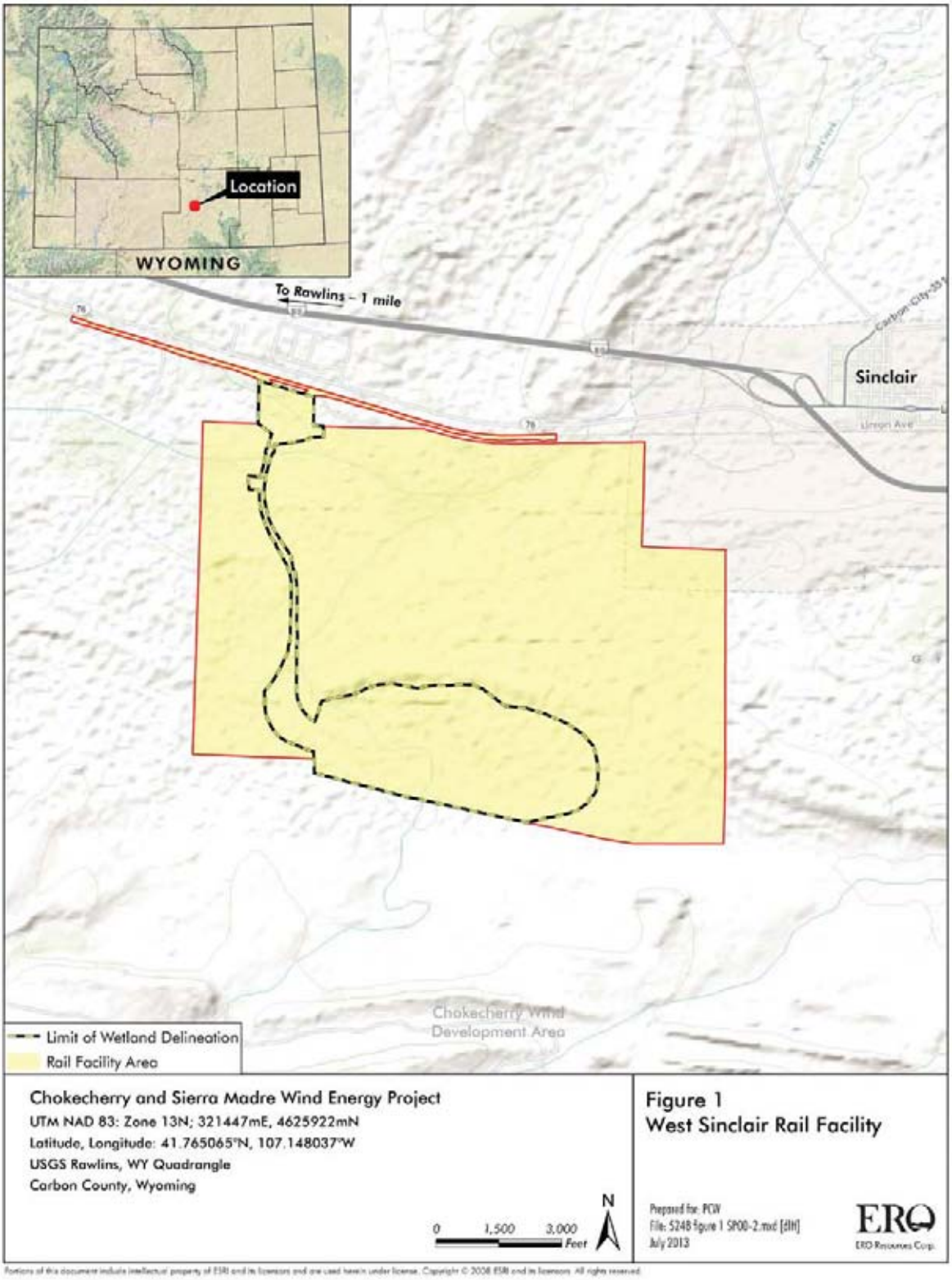

Figure 1. West Sinclair Rail Facility Area

In September 2012, PCW and ERO Resources Corporation (ERO) met with the U.S. Army Corps of Engineers (Corps) to discuss the CCSM Project, the wetland delineation method, and the Clean Water Act Section 404 permitting approach for the CCSM Project. Based on this meeting with the Corps, ERO implemented the wetland delineation methods described below. Leigh Rouse, Moneka Worah, Denise Larson, and Courtney Marne, all with ERO, delineated wetlands and other waters in the Rail Facility Site from October 22 to 24, 2012.

2.0 LOCATION

The CCSM Project is located south of Rawlins in Carbon County, Wyoming. The Rail Facility is southwest of Sinclair, Wyoming (Figure 1). The UTM coordinates of the approximate center are 321447mE, 4625922mN, Zone 13. The latitude/longitude of the approximate center is 41.765065°N/107.148037°W.

2.1 DIRECTIONS TO THE SITE

From Cheyenne, take Interstate 80 east to Sinclair, Wyoming. Take Exit 221 toward Sinclair and turn north on the frontage road for approximately 5 miles. The Rail Facility is south of the frontage road and existing railroad (Figure 1).

3.0 SITE CONDITIONS

The majority of the Rail Facility Site is flat with a small ridge in the southern portion of the facility. The Rail Facility Site is within the Intermountain Semi-Desert Province (sagebrush steppe) vegetation community. This vegetation community consists primarily of sagebrush and saltbrush with a variety of grasses in the understory. Near drainages, black greasewood and saltgrass become more dominant. The vegetation cover varies from less than 20 percent to about 80 percent due to the semiarid conditions of the area.

Sugar Creek, a perennial stream with wetlands along its streambanks, exists along the northern portion of the Rail Facility Site. Sugar Creek is approximately 25 feet wide where it crosses the Rail Facility running track. Three intermittent drainages tributary to Sugar Creek also occur within the Rail Facility Site. The northernmost tributary (Tributary 1) is a large alkali flat wetland and the other two tributaries (Tributaries 2 and 3) are ephemeral drainages. All three tributaries connect to Sugar Creek in the vicinity of the Rail Facility. Tributary 3 does not contain characteristics of waters of the U.S. in the southern portion of the delineated area as shown on Figure 2. Sugar Creek and Tributary 1 occur in hydrologic unit code 101800021303 and Tributaries 2 and 3 occur in hydrologic unit code 10180021304. Sugar Creek has a surface flow connection to the North Platte River, a traditionally navigable water (TNW).

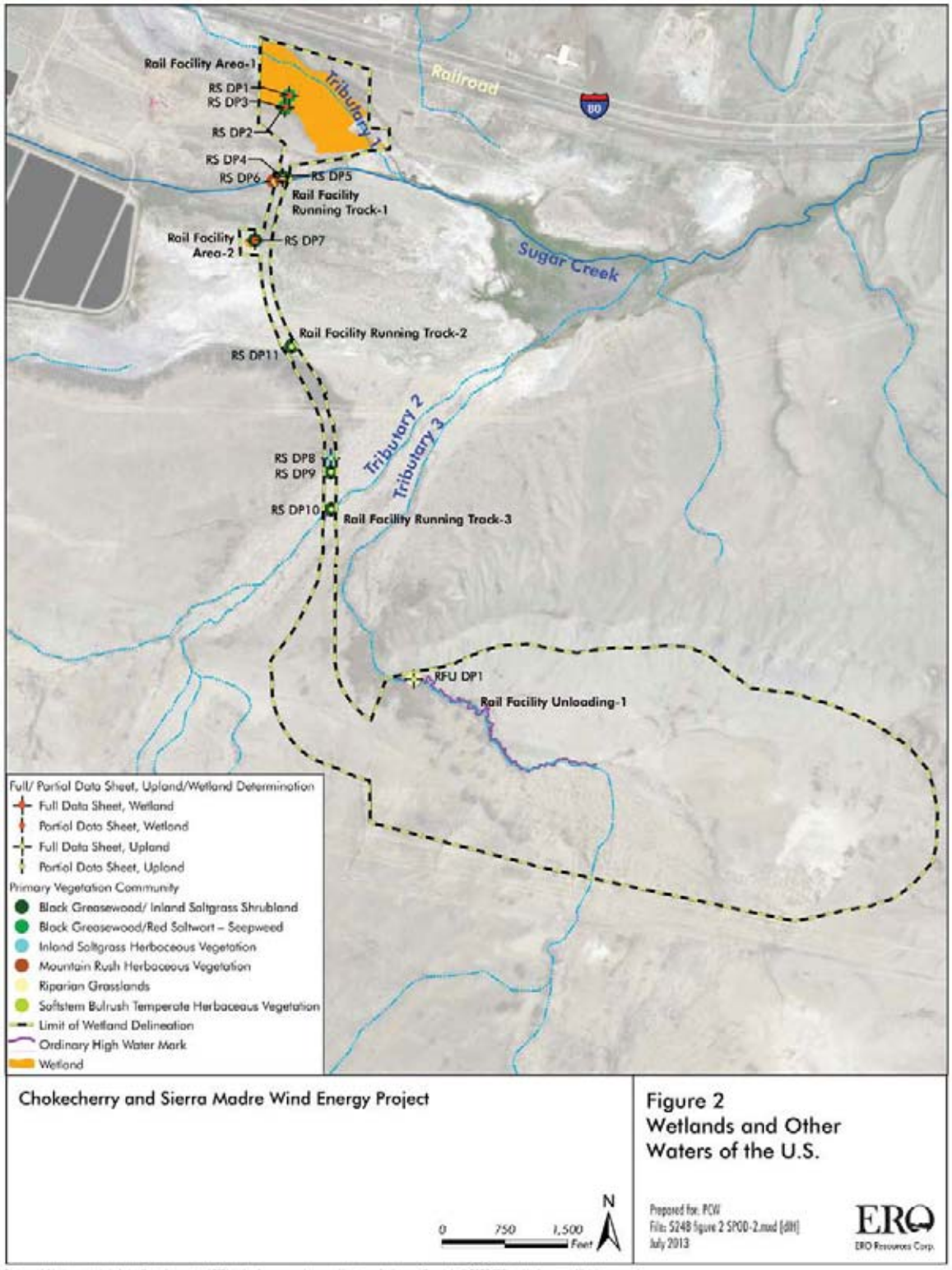

Figure 2. Wetlands and Other Waters of the U.S.

4.0 METHODS

4.1 WETLAND DELINEATION

ERO evaluated the delineated area of the Rail Facility Site for potential isolated wetlands, jurisdictional wetlands, and other waters of the U.S. Using methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Corps 2008a), and guidance from the Wyoming Regulatory Office of the Corps (May 1, 2011), ERO determined the presence of wetlands based on three wetland indicators: hydrophytic vegetation, hydric soils, and wetland hydrology. ERO followed the routine method under the 1987 Corps manual for areas that are equal to or less than 5 acres. Although the Rail Facility Site is greater than 5 acres, based on conversations with the Corps, it was determined the routine method was appropriate and the transect method was not necessary. This is based on the determination that the site is relatively homogeneous with respect to vegetation, soils, and hydrology regime. In addition, because the proposed project would only impact a certain section of the drainages and is overall a linear project, it did not seem appropriate to establish transects along the major watercourse where impacts were not proposed.

ERO applied the routine method by determining the plant community types at areas of proposed disturbance within the Rail Facility Site and completing data forms for representative points within each community type. Wetland determination data forms from the Regional Supplement were completed for each representative data point to determine which community types were wetlands. Where wetlands border uplands, data were collected from a set of upland and wetland data points, which determined indicators of the boundary between wetlands and nonwetlands. Each data point was identified by a unique label.

The wetland indicator status of plant species were identified using the National Wetland Plant List (Lichvar and Kartesz 2009) and taxonomy was determined using Vascular Plants of Wyoming (Dorn 2001). The plot size for each data point followed the Regional Supplement guidelines and absolute cover was recorded on each data form. Soil profile data were collected to a depth of 20 inches whenever possible to adequately characterize the soil profile; however, due to the time of year, for some data points a soil profile could only be collected to 8 inches or could not be taken due to frozen ground. Photos were taken at each data point of the vegetation community and soil profile, when a soil profile was recorded.

Plant communities in the delineated area of the Rail Facility Site were characterized as wetland or nonwetland (upland) plant communities based on data gathered from the data points within each community type including dominant plant species, landscape position, soils, and hydrological conditions. Each community type was based on the U.S. National Vegetation Classification (USNVC) as described in NatureServe (NatureServe 2013) and Field Guide to Wetland and Riparian Plant Associations in Colorado (Carsey et al. 2003) (Field Guide). The Field Guide for Colorado was used because a similar publication has not been completed for Wyoming and many of the plant communities are the same for both states. When the communities found within the delineated area of the Rail Facility Site did not fit

USNVC descriptions, the communities were described based on dominant plant species and landscape position. In some communities, such as Black Greasewood / Inland Saltgrass Shrubland, the USNVC descriptions include both wetlands and uplands, depending on landscape position and hydrological conditions. For this report, these communities were separated into wetlands and uplands.

Wetland boundaries within the delineated area of the Rail Facility Site were determined by plant communities, topographic changes, and other visible distinctions between wetlands and uplands. Additional data points were established, if necessary, to help define the wetland/upland boundary if an area was determined to be atypical or if an area had mosaic characteristics that were not identified from previous data points.

Intermittent, ephemeral, and perennial drainages with characteristics of an active channel, such as a defined bed and bank, ordinary high water mark (OHWM), and other erosional features, were also identified. When determining the OHWM, ERO used *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Corps 2008b). Any other potential waters of the U.S., including playas, salt flats, canals, and ditches, were also identified during the survey. Photos were taken of each type of feature identified in the Rail Facility Site.

The dimensions of drainages with the characteristics and boundaries of wetlands were mapped using a Trimble GEOXT Global Positioning System (GPS) unit or drawn onto aerial photography when appropriate. Data were differentially corrected using the CompassCom base station. All differential corrections were completed using Trimble Pathfinder Office 4.20 software. GPS data were incorporated onto base mapping using ARC Geographic Information System (GIS) software. Ponds, lakes, and other water bodies were identified and mapped using the higher of either the water surface elevation or OHWM.

The wetland delineation was focused on sections of the Rail Facility Site where disturbance is proposed. The delineation included the delineation area as shown on Figure 2. Based on discussions with PCW, it was determined that construction of the Rail Facility would avoid the other areas in the Rail Facility Site (those areas outside of the delineation limits shown on Figure 2).

4.2 WETLAND CLASSIFICATION

Wetlands are classified according to the U.S. Fish and Wildlife Service's (Service) Cowardin classification system (Cowardin et al. 1979) combined with a hydrogeomorphic (HGM) approach (Brinson 1993) (Table 9 on page 23). HGM classes found in Wyoming are mineral soil flats, organic soil flats, riverine, lacustrine fringe, slope, and depressional. The Cowardin classification uses a hierarchical structure of systems, subsystems, and classes to classify both wetlands and deepwater habitats. Wetlands with persistent vegetation are classified in the Cowardin system as palustrine, which typically includes wetlands referred to as marshes, fens, wet meadows, and sloughs. The palustrine system also includes small, shallow, permanent, or intermittent water bodies such as ponds. Palustrine wetlands may be situated shoreward of

lakes and river channels, on river floodplains, in isolated catchments, or on slopes (Cowardin et al. 1979). Under the palustrine system, wetlands are classified as emergent (erect, rooted, herbaceous, and usually perennial hydrophytes that remain standing until at least the next growing season); scrub-shrub (woody vegetation less than 20 feet tall); or forested (woody vegetation 20 feet or taller).

The Cowardin riverine system includes wetlands and deepwater habitats contained within a channel, with the exception of wetlands dominated by trees, shrubs, and emergent vegetation. The riverine system usually contains flowing water and is bounded on the landward side by uplands, channel banks, or other wetlands. Within the riverine system, wetlands are divided into the tidal, lower perennial (low gradient and slow water), upper perennial (high gradient and fast water), and intermittent subsystems. Within these subsystems, riverine wetlands are further classified as unconsolidated bottom, aquatic bed, streambed, rocky shore, unconsolidated shore, and emergent wetland (nonpersistent).

5.0 WETLANDS AND OTHER WATERS

ERO delineated 21.36 acres of wetlands and 0.14 acre of other waters in the delineated area of the Rail Facility Site (Figure 2). Wetlands and other waters in the delineated area are described below. Wetland determination data forms were completed at eight data points within the Rail Facility Site (Appendix A). Each wetland and other water feature was given a unique identifying label. Table 9 on page 23 summarizes the wetlands mapped in the delineated area of the Rail Facility Site and lists each wetland label and its wetland type. Wetlands were found along Sugar Creek, Tributary 1, and a small alkali flat off the Rail Facility running track.

Palustrine emergent wetlands and palustrine scrub-shrub wetlands are the two types of Cowardin-classified vegetated wetlands within the delineated area of the Rail Facility Site. Palustrine emergent wetlands are nontidal wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. Within the delineated area, these wetlands are included under the subclass “persistent” because the vegetation persists until the next growing season. Palustrine Scrub-Shrub are nontidal wetlands dominated by woody vegetation less than 20 feet tall. Within the delineated area, these wetlands are included under the subclass “broad-leaved” deciduous.

The communities, along with their Cowardin classification, prevalent species, and species wetland indicators found in the delineated area are described below. The definitions of the wetland indicator for each species are:

- Obligate Wetland (OBL)—Occurs with an estimated 99% probability in wetlands.
- Facultative Wetland (FACW)—Estimated 67%–99% probability of occurrence in wetlands.
- Facultative (FAC)—Equally likely to occur in wetlands and nonwetlands (34%–66% probability).

- Facultative Upland (FACU)—67%–99% probability in nonwetlands, 1%–33% in wetlands.
- Upland (UPL)—>99% probability in nonwetlands in this region.
- NI—No Indicator or no information available.

6.0 WETLAND COMMUNITIES

6.1 WETLAND – MOUNTAIN RUSH HERBACEOUS VEGETATION

6.1.1 Palustrine Emergent Wetland

This wetland community occurs on flat stream benches within the Rail Facility Site (Figure 3; Table 1). This community generally occurs in seasonally saturated soils and is dominated by mountain rush, with a variety of other herbaceous wetland species commonly observed. Within the Rail Facility Site, this wetland community transitions to the upland community of Black Greasewood / Inland Saltgrass Shrubland.

Table 1. Prevalent species in Mountain Rush Herbaceous Vegetation community

Scientific Name	Common Name	Wetland Indicator
Agrostis gigantea	Redtop (black bent)	FACW
Carex nebrascensis	Nebraska sedge	OBL
Carex praegracilis	Clustered field sedge	FACW
Deschampsia cespitosa	Tufted hairgrass	FACW
Distichlis spicata	Inland salt grass	FAC
Eleocharis palustris	Common spikerush	OBL
Ericameria nauseosa	Rubber rabbitbrush	UPL
Festuca sp.	Fescue sp.	FAC to UPL
Hordeum jubatum	Foxtail barley	FAC
Iris missouriensis	Iris	FACW
Juncus arcticus	Mountain (Arctic) rush	FACW
Leymus cinereus	Basin wildrye (Great Basin lyme grass)	FAC
Schoenoplectus maritimus	Cosmopolitan bulrush	OBL
Sporobolus airoides	Alkali-sacaton	FAC
Triglochin sp.	Arrowgrass	OBL

Soils – Soil data were gathered at one data point (RS DP6, Figure 2). The soils have a matrix of 10YR 5/2. Mottles are present with a chroma of 7.5YR 5/8. The soils meet criteria for the depleted matrix hydric soil indicator. The soils are mostly loamy clay to clay loam.

Hydrology – The primary hydrology indicator for this community is saturation at the surface.

Figure 3. Mountain Rush Herbaceous Vegetation wetland abutting the Softstem Bulrush community at RS DP6.

6.2 WETLAND – SOFTSTEM BULRUSH TEMPERATE HERBACEOUS VEGETATION

6.2.1 Palustrine Emergent Wetland

Only found in one location in the delineated area of the Rail Facility Site, bulrushes occur in shallow pools of water in slow-moving streams to saturated areas (Figure 4; Table 2). The surrounding plant community is the Mountain Rush Herbaceous community.

Table 2. Prevalent species in Softstem Bulrush Temperate Herbaceous Vegetation community

Scientific Name	Common Name	Wetland Indicator
Deschampsia cespitosa	Tufted hairgrass	FACW
Eleocharis palustris	Common spikerush	OBL
Lepidium latifolium	Broadleaf pepperwort	FAC
Plantago lanceolata	English plantain	FAC
Poa pratensis	Kentucky bluegrass	FAC
Polypogon monspliensis	Annual rabbitsfoot grass	FACW
Schoenoplectus maritimus	Cosmopolitan bulrush	OBL
Schoenoplectus tabernaemontani	Softstem bulrush	OBL

Soils – Soil data were gathered at one data point (RS DP4, Figure 2). At RS DP4, the soils have a matrix chroma of 10YR 5/2 with mottles of 7.5YR 5/8 in the upper 6 inches, meeting the criteria for the depleted matrix hydric soil indicator. The soils are primarily loamy clay.

Hydrology – The primary hydrology indicator for this community is surface water and saturation at the surface.

Figure 4. Channel with adjacent wetland vegetation dominated by the Softstem Bulrush Temperate Herbaceous community at RS DP4.

6.3 WETLAND – BLACK GREASEWOOD / INLAND SALTGRASS SHRUBLAND

6.3.1 Palustrine Scrub-Shrub Wetland

This wetland occurs on alkali flats and depressions, commonly with salt deposits on the surface (Figure 5; Table 3). Black greasewood shrubs dominate the overstory. Saltgrass and other wetland herbaceous species comprise the understory. The understory is sometimes sparsely vegetated. This wetland vegetation community differs from the Upland Black Greasewood / Inland Saltgrass Shrubland community by having more wetland species and having indicators of wetland soils and hydrology. The similar upland community contains more facultative upland or upland vegetation, such as Great Basin wildrye, Kentucky bluegrass, or kochia. The boundary between uplands and wetlands occurs where these upland grasses are replaced by facultative and facultative wetland species such as rough bentgrass and foxtail barley.

Table 3. Prevalent species in Black Greasewood / Inland Saltgrass Shrubland community

Scientific Name	Common Name	Wetland Indicator
Agrostis scabra	Rough bentgrass	FAC
Atriplex tridentata (gardneri subsp. *utahensis)*	Gardner's saltbrush	FACW
Bassia hyssopifolia	Five-horn smotherweed	FAC
Hordeum jubatum	Foxtail barley	FAC
Iva axillaris	Povertyweed (deer-root)	FAC
Juncus arcticus	Mountain (Arctic) rush	FACW
Salicornia rubra	Glasswort	OBL
Sarcobatus vermiculatus	Black greasewood	FAC

Soils – Soil data were gathered at two data points (RS DP2 and RS DP7, Figure 2). At RS DP2, the soils have a matrix chroma of 10YR 5/3 with mottles of 5YR 4/4. At RS DP7, the soils have a matrix of 10YR 4/2. No redox features were observed. At both points, the soils do not meet the criteria for any of the hydric soil indicators; however, they appear to be problematic due to being within an alkaline flat and, therefore, hydric soils are assumed. The soils are clay loam and sandy clay loam.

Hydrology – The primary hydrology indicators for this community are a salt crust and surface soil cracks.

Figure 5. Salt Flat containing the Black Greasewood / Inland Saltgrass Shrubland community at RS DP7.

6.4 WETLAND – BLACK GREASEWOOD / RED SALTWORT – SEEPWEED

6.4.1 Palustrine Scrub-Shrub Wetland

This sparsely vegetated community occurs on alkali flats with fine-textured soils (Figure 6; Table 4). In wetter areas, red saltwort and seepweed dominate, with black greasewood becoming more common along the edges or in other drier areas. The center of the alkali flats may be unvegetated. This community primarily transitions to the Black Greasewood / Inland Saltgrass Shrubland wetland or upland community.

Table 4. Prevalent species in Black Greasewood / Red Saltwort – Seepweed community

Scientific Name	Common Name	Wetland Indicator
Chrysothamnus parryi	Rubber rabbitbrush	UPL
Elymus trachycaulus	Slender wildrye	FACU
Juncus arcticus	Mountain (Arctic) rush	FACW
Puccinellia nuttalliana	Nuttall's alkali grass	FACW
Salicornia rubra	Glasswort	OBL
Sarcobatus vermiculatus	Black greasewood	FAC
Suaeda calceoliformis	Pursh seepweed	FACW
Suaeda nigra	Shrubby seepweed	OBL

Soils – Soil data were gathered at one data point (RS DP1, Figure 2). At RS DP1, the soils have a matrix chroma of 10YR 2/2 for the first inch below ground surface (bgs), 2.5YR 4/2 between 1 and 3 inches, and 7.5YR 4/3 below 3 inches. Redox features of 10YR 4/6 are present below 1 inch bgs. The soils meet the criteria for the red parent material hydric soil indicator. The soils are silty clay.

Hydrology – The primary hydrology indicators for this community are a salt crust, surface soil cracks, and oxidized rhizospheres on living roots.

Figure 6. Black Greasewood / Red Saltwort – Seepweed wetland observed at RS DP1.

7.0 UPLAND COMMUNITIES

7.1 UPLAND – BIG SAGEBRUSH STEPPE GROUP

The Big Sagebrush Steppe Group includes several plant associations depending on the associated shrubs and herbaceous species, with big sagebrush being the dominant species in all plant associations. Big sagebrush covers the level plains and mountain slopes and commonly occurs adjacent to wetlands (Figure 7; Table 5). Within the Rail Facility Site, this community does not occur adjacent to any wetlands and is found near the southern ridge of the site.

Table 5. Prevalent species in Big Sagebrush Steppe Group community

Scientific Name	Common Name	Wetland Indicator
Artemisia tridentata subsp. *tridentata*	Big Basin sagebrush	UPL
Elymus trachycaulus	Slender wheatgrass	UPL
Eriacameria nauseosa	Rubber rabbitbrush	FACU
Eriogonum umbellatum	Sulphur-flower buckwheat	UPL
Festuca idahoensis	Idaho fescue	UPL
Gutierrezia sarothrae	Broom snakeweed	FACU
Juncus arcticus	Mountain (Arctic) rush	UPL
Koeleria macrantha	Prairie junegrass	FACW
Leymus cinereus	Great Basin wildrye	UPL
Pascopyrum smithii	Western wheatgrass	FAC
Phlox hoodii	Spiny phlox	FAC
Poa pratensis	Kentucky bluegrass	UPL
Pseudoroegneria spicata	Bluebunch wheatgrass	FAC
Purshia tridentata	Antelope bitterbrush	UPL
Rosa woodsii	Woods' rose	UPL
Salix exigua	Sandbar (narrowleaf) willow	FACU
Sarcobatus vermiculatus	Black greasewood	FACW
Stenotus acaulis	Stemless mock goldenweed	FAC
Symphoricarpos sp.	Snowberry	UPL

Figure 7. Upland – Big Sagebrush Steppe Group vegetation

7.2 UPLAND – BLACK GREASEWOOD / INLAND SALTGRASS SHRUBLAND

This community commonly occurs on the upper slopes adjacent to the Black Greasewood wetland communities (Figure 8; Table 6). The understory species vary, with black greasewood being the dominant overstory species. The soils are fine textured and alkali. The lack of hydrology, increase in upland herbaceous understory, and topographic change separate this community from the Black Greasewood wetland community. Soil profiles at two data points (RS DP3 and RS DP5, Figure 2) showed a matrix chroma of 10YR 4/3 and 2.5Y 4/3, with RS DP3 containing mottles of 7.5YR 5/8. The soils vary from clay, clay loam, to sandy loam.

Table 6. Prevalent species in Black Greasewood / Inland Saltgrass Shrubland community

Scientific Name	Common Name	Wetland Indicator
Agropyron cristatum	Crested wheatgrass	UPL
Artemisia arbuscola	Little sagebrush	UPL
Astragalus bisulcatus	Twogrooved milkvetch	UPL
Atriplex canescens	Four-wing saltbush	UPL
Atriplex confertifolia	Shadscale saltbrush	UPL
Atriplex tridentata (gardneri subsp. *utahensis)*	Gardner's saltbrush	FACW
Cirsium arvense	Canada thistle	FACU
Elymus elymoides	Western bottle-brush grass	FACU
Ericameria nauseosa	Rubber rabbitbrush	UPL
Juncus arcticus	Mountain (Arctic) rush	FACW
Pascopyrum smithii	Western wheatgrass	FAC
Poa secunda	Curly bluegrass	FACU
Puccinellia nuttalliana	Nuttall's alkaligrass	FACW
Salicornia rubra	Glasswort	OBL
Sarcobatus vermiculatus	Black greasewood	FAC
Suaeda calceoliformis	Pursh seepweed	FACW

Figure 8. Upland area consisting of the Black Greasewood / Inland Saltgrass Shrubland community at RS DP3.

7.3 UPLAND – INLAND SALTGRASS HERBACEOUS VEGETATION

This herbaceous community was found in a fairly flat swale without any indication of surface flows (Figure 9; Table 7). Saltgrass sparsely covers the fine-textured alkali/saline soils. At RS DP8 (Figure 2), the soils have a matrix chroma of 10YR 3/2, with no redox features observed. The soils are clay loam.

Table 7. Prevalent species in Inland Saltgrass Herbaceous Vegetation community

Scientific Name	Common Name	Wetland Indicator
Distichlis spicata	Inland saltgrass	FAC

Figure 9. Inland Saltgrass Herbaceous community observed at RS DP8 surrounded by greasewood and saltbush shrubs.

7.4 UPLAND – RIPARIAN GRASSLANDS

The Riparian Grasslands community contains a variety of mostly upland grasses and occurs in vegetated swales and around ephemeral drainages (Figure 10; Table 8). Riparian Grasslands also form the upland border around wetland stream systems. At Rail Facility Unloading (RFU) DP1 (Figure 2), the soils have a matrix chroma of 10YR 3/2, with no redox features observed. The soils are clay loam.

Table 8. Prevalent species in Riparian Grasslands community

Scientific Name	Common Name	Wetland Indicator
Bromus inermis	Smooth brome	FACU
Bromus tectorum	Cheatgrass	UPL
Carex praegracilis	Clustered field sedge	FACW
Elymus trachycaulus	Slender wheatgrass	FACU
Juncus arcticus	Mountain (Arctic) rush	FACW
Leymus cinereus	Great Basin wildrye	FAC
Pascopyrum smithii	Western wheatgrass	FAC
Phleum pratense	Timothy	FACU
Poa pratensis	Kentucky bluegrass	FAC
Rosa woodsii	Woods' rose	FACU
Symphoricarpos oreophilus	Mountain snowberry	UPL

Figure 10. Riparian Grasslands observed at RFU DP1.

8.0 CONCLUSIONS

A total of 21.36 acres of wetlands and 0.14 acre of other waters were mapped in the delineation area (Table 9). The wetlands along Sugar Creek and Tributary 1 are riverine palustrine emergent or scrub-shrub wetlands. The wetlands in the alkali flat off the Rail Facility running track are mineral soil flat scrub-shrub wetlands. The wetlands hydrology source is primarily surface water for all of the wetlands present in the delineated area of the Rail Facility Site. Sugar Creek and Tributaries 1, 2, and 3 have a surface flow connection to the North Platte River, a TNW. The wetland off the Rail Facility running track does not appear to have a surface flow connection to known waters of the U.S.

Table 9. Summary of wetlands and other waters in the Rail Facility Site.

Segment/Feature Label	Data Point ID	Vegetation Community	Aquatic Resource Type	Delineated Acres
Rail Facility Area-1	RS DP1, RS DP2	Black Greasewood / Red Saltwort –Seepweed	Emergent Wetland	21.05
Rail Facility Area-2	RS DP7	Black Greasewood / Inland Saltgrass Shrubland	Scrub-Shrub Wetland	0.25
Rail Facility Running Track-1	RS DP4, RS DP5, RS DP6	Softstem Bulrush Temperate Herbaceaus Vegetation / Mountain Rush Herbaceous Vegetation	OHWM	0.02
			Emergent Wetland	0.06
Rail Facility Running Track-2	RS DP11	Black Greasewood / Inland Saltgrass Shrubland	OHWM	0.01
Rail Facility Running Track-3	RS DP10	Black Greasewood / Inland Saltgrass Shrubland	OHWM	0.01
Rail Facility Unloading-1	RFU DP1	Riparian Grasslands	OHWM	0.10
Grand Total				**21.5**

9.0 REFERENCES

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Attachment A

Data Forms – Routine Wetland Determination and Crossing Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-23-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RFU DP1

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): D Lat: 41.7589389N Long: -107.1649911E Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Within ephemeral channel, 1-3 ft wide (Tributary 3). Riparian Grasslands community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Bromus tectorum	15	Y	UPL
2. Elymus trachycaulus	20	Y	FACU
3. Pascopyrum smithii	20	Y	FAC
4. Poa pratensis	15	Y	FAC
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	35	x 3 = 105
FACU species	20	x 4 = 80
UPL species	15	x 5 = 75
Column Totals:	70 (A)	260 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** _____ **No** X

Remarks:

SOIL

Sampling Point: RFU DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16+	10YR 3/2	100					ClLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Soil too hard to dig deeper.

Depth (inches): 16+

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No redox features observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP1

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Salt flat Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): D Lat: 41.7778978545N Long: -107.171091821E Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil Yes, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Wetlands in alkali flat along tributary to Sugar Creek - Black Greasewood/Red Saltwort - Seepweed community

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1. Sarcobatus vermiculatus	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Salicornia rubra	70	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/2	100					SiCl	
1-3	2.5Y 4/2	93	10YR 4/6	7	C	M	SiCl	
3-17+	7.5YR 4/3	98	10YR 4/6	2	C	PL	SiCl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ☑ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): 17+

Hydric Soil Present? Yes X No ___

Remarks:

Problematic soils due to alkaline soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ☑ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ☑ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP2

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Salt Flat Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): D Lat: 41.777517502 Long: -107.17128007 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil Yes, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Wetlands in alkali flat along tributary to Sugar Creek - Black Greasewood/Inland Saltgrass Shrubland Wetland community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1. Sarcobatus vermiculatus	35	Y	FAC
2.			
3.			
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Salicornia rubra	15	Y	OBL
2. Bassia hyssopifolia	20	Y	FAC
3. Disctichilis spicata	15	Y	FAC
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/2	92	5YR 4/4	8	C	PL	SaLo	
2-20	10YR 5/3	80	5YR 4/4	20	C	PL	SaLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Problematic soils due to alkaline soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP3

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Salt Flat Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): D Lat: 41.7774813874 Long: -107.171278594 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil Yes, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point adjacent to salt flat. Did not contain hydric soils or hydrology. Black Greasewood/Inland Saltgrass Shrubland Upland community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Sarcobatus vermiculatus	60	Y	FAC
2.			
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 5 ft. radius)			
1. Disctichilis spicata	15	Y	FAC
2. Bassia hyssopifolia	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 65 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	95	x 3 = 285
FACU species	0	x 4 = 0
UPL species	0	x 5 = 0
Column Totals:	95 (A)	285 (B)

Prevalence Index = B/A = 3

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ☑ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5YR 4/2	100					SaLo	
5-20	2.5YR 4/3	90	7.5YR 5/8	10	C	M, PL	SaLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

Does not meet the hydric soil requirements

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Did not contain salt crust found at adjacent data point

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP4

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): D Lat: 41.775203656 Long: -107.171283434 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

3-4 foot WUS between wetland banks. Wetlands along Sugar Creek. Softstem Bulrush Temperate Herbaceous Vegetation Community

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Schoenoplectus maritimus	45	Y	OBL
2. Lepidium latifolium	40	Y	FAC
3. Plantago lanceolata	2	N	FAC
4. Poa pratensis	5	N	FAC
5.			
6.			
7.			
8.			
	92 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 8 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	95	7.5YR 5/8	5	C	PL	LoCl	
6-20	10YR 5/2	100					LoCl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ☑ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP5

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): D Lat: 41.7752260465 Long: -107.171300967 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

Upland point along banks of Sugar Creek.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1. Sarcobatus vermiculatus	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Disctichilis spicata	60	Y	FAC
2. Atriplex gardneri	10	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16+	10YR 4/3	100					ClLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Soil too hard to dig deeper

Depth (inches): 16+

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No redox features observed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP6

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): D Lat: 41.7750804466 Long: -107.171693052 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Wetlands along Sugar Creek - Mountain Rush Herbaceous Vegetation community

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Schoenoplectus maritimus	40	Y	OBL
2. Lepidium latifolium	30	Y	FAC
3. Juncus acticus	25	Y	FACW
4. Plantago lanceolata	5	N	FAC
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	95	7.5YR 5/8	5	C	PL	LoCl	
6-20	10YR 5/2	100					LoCl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ☑ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP7

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): D Lat: 41.7731300643 Long: -107.172431581 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil Yes, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** X **No** _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

Problematic soils due to alkaline soils. Wetland - Black Greasewood/Inland Saltgrass Shrubland community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. radius)			
1. Sarcobatus vermiculatus	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5 ft. radius)			
1. Atriplex gardneri	30	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

SOIL

Sampling Point: RS DP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8+	10YR 4/2	100					ClLo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Soil too hard to dig deeper

Depth (inches): 8+

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Problematic soils due to alkaline soils.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chokecherry and Sierra Madre Wind Energy Project City/County: Carbon County Sampling Date: 10-22-12

Applicant/Owner: Power Company of Wyoming State: WY Sampling Point: RS DP8

Investigator(s): Leigh Rouse and Courtney Marne Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): D Lat: 41.7660909595 Long: -107.168866975 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

No potential waters of the U.S. observed. Inland Saltgrass Herbaceous Vegetation Community.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 ft. Radius)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5 ft. Radius)			
1. Disctichilis spicata	55	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 45 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks:

Uplands dominated by Sarcobatus vermiculatus with about 35% vegetative cover. Data point is within a vegetated swale. No ordinary high water mark characteristics.

SOIL

Sampling Point: RS DP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10+	10YR 3/2	100					ClLp	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Soil too hard to dig deeper

Depth (inches): 10+

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Difficult to dig after 8 inches due to time of year. No redox features observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ☑ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

CHOKECHERRY CROSSING SITE FORM

Crossing ID (road segment- number) RS DP9 Date: 10-22-12

Investigators Leigh Rouse and Courtney Marne

SITE CONDITIONS

Type of Feature:

☒ Upland-vegetated swale ☐ Wetland-vegetated swale ☐ WUS w/Wet ☐ WUS Only ☐ Other _____

Width of WUS in feet (if present) N/A

Physical Setting/Stressors

Slope 1 %

Shape of drainage: ☐ V-shaped ☒ Flat-bottomed ☐ Incised channel w/overbank ☐ Salt flat ☐ Wet meadow ☐ Basin

HGM Class: ☒ Riverine ☐ Depression ☐ Slope ☐ Lacustrine

Water Source: ☒ Stream ☐ Groundwater ☐ Irrigation

Water Supply: ☐ Perennial ☐ Intermittent ☒ Ephemeral

Barriers: ☐ Road/culvert ☐ Rock outcrop/vertical face ☒ Fences

☒ Livestock use

☐ Noxious weeds

VEGETATION

Dominant Community Hydrophytic? ☐ Yes ☒ No

Dominant Vegetation Communities	Relative Cover (%)	Wetland or Upland	Cowardin Code
1. Inland Saltgrass Herbaceous Vegetation	55	Upland	
2.			
3.			
4.			
5.			
6.			
7.			
8.			

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom (UB) Aquatic Bed (AB) Rocky Shore (RS) Uncon Shore (US) Emergent(EM) Shrub-scrub (SS) Forested (FO)	Floating vascular (f); Rooted vascular (r); Algal (a); Persistent (p); Non-Persistent (n); Broad-leaved deciduous (b); Needle-leaved evergreen (e); Cobble – gravel (c); Sand (s); Mud (m); Organic (o)	Temporarily flooded (A); Saturated (B); Seasonally flooded (C); Seas.-fld./sat. (E); Semi-Perm. Flooded (F); Intermittently exposed (G); Artificially flooded (K); Sat./semiperm./Seas. (Y); Int. exposed/permanent (Z)	Hypersaline (7) ; Eusaline (8); Mixosaline (9); Fresh (0); Acid (a); Circumneutral (c); Alkaline/calcareous (i); Organic (g); Mineral (n); Beaver (b); Partially Drained/ditched (d); Farmed (f); Diked/impounded (h); Art. Substrate (r); Spoil (s); Excavated (x)
Palustrine	Palustrine				
Riverine	Lower perennial; Upper perennial; Intermittent				

DATA COLLECTION

☒ GPS point taken ☐ WUS/Wetland GPSed

☒ Photos of crossing (u/s & d/s) ☐ WUS/Wetland drawn on map

☒ Upland and wetland communities noted

Routine Determination Form(s) Completed? ☒ No ☐ Yes Data Point ID(s) RS DP8 is associated data form for this community

Remarks:

Surface soil cracks along the channel bottom.
Banks on both sides of the channel are eroded and un-vegetated. Incised channel does not contain characteristics of an ordinary high water mark
Upland vegetative cover is about 50% and dominated by Sarcobatus vermiculatus.

CHOKECHERRY CROSSING SITE FORM

Crossing ID (road segment- number) RS DP10 Date: 10-22-12

Investigators Leigh Rouse and Courtney Marne

SITE CONDITIONS

Type of Feature:

☐ Upland-vegetated swale ☐ Wetland-vegetated swale ☐ WUS w/Wet ☒ WUS Only ☐ Other _____

Width of WUS in feet (if present) 3 ft.

Physical Setting/Stressors

Slope 1 %

Shape of drainage: ☐ V-shaped ☒ Flat-bottomed ☐ Incised channel w/overbank ☐ Salt flat ☐ Wet meadow ☐ Basin

HGM Class: ☒ Riverine ☐ Depression ☐ Slope ☐ Lacustrine

Water Source: ☒ Stream ☐ Groundwater ☐ Irrigation

Water Supply: ☐ Perennial ☐ Intermittent ☒ Ephemeral

Barriers: ☐ Road/culvert ☐ Rock outcrop/vertical face ☒ Fences

☒ Livestock use

☐ Noxious weeds

VEGETATION

Dominant Community Hydrophytic? ☐ Yes ☒ No

Dominant Vegetation Communities	Relative Cover (%)	Wetland or Upland	Cowardin Code
1. Inland Saltgrass Herbaceous Vegetation	<5	Upland	
2.			
3.			
4.			
5.			
6.			
7.			
8.			

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom (UB) Aquatic Bed (AB) Rocky Shore (RS) Uncon Shore (US) Emergent(EM) Shrub-scrub (SS) Forested (FO)	Floating vascular (f); Rooted vascular (r); Algal (a); Persistent (p); Non-Persistent (n); Broad-leaved deciduous (b); Needle-leaved evergreen (e); Cobble – gravel (c); Sand (s); Mud (m); Organic (o)	Temporarily flooded (A); Saturated (B); Seasonally flooded (C); Seas.-fld./sat. (E); Semi-Perm. Flooded (F); Intermittently exposed (G); Artificially flooded (K); Sat./semiperm./Seas. (Y); Int. exposed/permanent (Z)	Hypersaline (7) ; Eusaline (8); Mixosaline (9); Fresh (0); Acid (a); Circumneutral (c); Alkaline/calcareous (i); Organic (g); Mineral (n); Beaver (b); Partially Drained/ditched (d); Farmed (f); Diked/impounded (h); Art. Substrate (r); Spoil (s); Excavated (x)
Palustrine	Palustrine				
Riverine	Lower perennial; Upper perennial; Intermittent				

DATA COLLECTION

☐ GPS point taken ☐ WUS/Wetland GPSed

☐ Photos of crossing (u/s & d/s) ☒ WUS/Wetland drawn on map

☒ Upland and wetland communities noted

Routine Determination Form(s) Completed? ☒ No ☐ Yes Data Point ID(s) DP8 is the associated data form

Remarks:

Surface soil cracks along the channel bottom.
Banks on both sides of the channel are eroded and un-vegetated.
Upland vegetative cover is about 50% and dominated by Sarcobatus vermiculatus.

CHOKECHERRY CROSSING SITE FORM

Crossing ID (road segment- number) RS DP11 Date: 10-22-12

Investigators Leigh Rouse and Courtney Marne

SITE CONDITIONS

Type of Feature:

☐ Upland-vegetated swale ☐ Wetland-vegetated swale ☐ WUS w/Wet ☐ WUS Only ☒ Other Salt flat

Width of WUS in feet (if present) N/A

Physical Setting/Stressors

Slope 0 %

Shape of drainage: ☐ V-shaped ☐ Flat-bottomed ☐ Incised channel w/overbank ☒ Salt flat ☐ Wet meadow ☐ Basin

HGM Class: ☐ Riverine ☐ Depression ☐ Slope ☐ Lacustrine

Water Source: ☐ Stream ☐ Groundwater ☐ Irrigation

Water Supply: ☐ Perennial ☐ Intermittent ☐ Ephemeral

Barriers: ☐ Road/culvert ☐ Rock outcrop/vertical face ☒ Fences

☒ Livestock use

☐ Noxious weeds

VEGETATION

Dominant Community Hydrophytic? ☒ Yes ☐ No

Dominant Vegetation Communities	Relative Cover (%)	Wetland or Upland	Cowardin Code
1. Black Greasewood/ Inland Saltgrass Shrubland	75	Upland	
2.			
3.			
4.			
5.			
6.			
7.			
8.			

System	Subsystem	Class	Subclass	Water Regime	Other Modifiers
Lacustrine	Littoral; Limnoral	Rock Bot. (RB) Uncon Bottom (UB) Aquatic Bed (AB) Rocky Shore (RS) Uncon Shore (US) Emergent(EM) Shrub-scrub (SS) Forested (FO)	Floating vascular (f); Rooted vascular (r); Algal (a); Persistent (p); Non-Persistent (n); Broad-leaved deciduous (b); Needle-leaved evergreen (e); Cobble – gravel (c); Sand (s); Mud (m); Organic (o)	Temporarily flooded (A); Saturated (B); Seasonally flooded (C); Seas.-fld./sat. (E); Semi-Perm. Flooded (F); Intermittently exposed (G); Artificially flooded (K); Sat./semiperm./Seas. (Y); Int. exposed/permanent (Z)	Hypersaline (7) ; Eusaline (8); Mixosaline (9); Fresh (0); Acid (a); Circumneutral (c); Alkaline/calcareous (i); Organic (g); Mineral (n); Beaver (b); Partially Drained/ditched (d); Farmed (f); Diked/impounded (h); Art. Substrate (r); Spoil (s); Excavated (x)
Palustrine	Palustrine				
Riverine	Lower perennial; Upper perennial; Intermittent				

DATA COLLECTION

☒ GPS point taken

☒ Photos of crossing (u/s & d/s)

☒ Upland and wetland communities noted

☒ WUS/Wetland GPSed

☐ WUS/Wetland drawn on map

Routine Determination Form(s) Completed? ☒ No ☐ Yes Data Point ID(s) RS DP7 associated wetland data form

Remarks:

Area has an intermittent salt crust and surface cracks.

Inscised channel observed in the area. Channel has less than 5% vegetation.

APPENDIX L

Chokecherry and Sierra Madre Wind Energy Project
Site-Specific Reclamation Plan
West Sinclair Rail Facility

Prepared for

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March 2014

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Master Reclamation Plan for the CCSM Project (BLM 2012a: Appendix B). The Master Reclamation Plan for the CCSM Project provides an overview of the reclamation goals, standards and procedures that will be used to ensure successful reclamation of disturbed areas.

SWCA Environmental Consultants (SWCA) has prepared this Site-specific Reclamation Plan (Plan) for the West Sinclair Rail Facility (Rail Facility), an integral component of the CCSM Project, in accordance with the CCSM Project Master Reclamation Plan. The Rail Facility

connects the CCSM Project to the existing Union Pacific Railroad located south of Interstate 80 along the northern boundary of the CCSM Project (Figure 1).

This Site-specific Reclamation Plan describes the methods for reclaiming disturbance associated with the Rail Facility and the processes for monitoring and reporting on reclamation success. These procedures were developed in accordance with BLM Wyoming Reclamation Policy (2012b), Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), RFO Reclamation Guidance (BLM 2011), Wyoming Department of Environmental Quality (WDEQ) Land Quality Division reclamation guidelines (WDEQ 2007), and State of Wyoming's reclamation guidance for wind development, in coordination with BLM staff.

The reclamation procedures and success standards set out in the CCSM Project Master Reclamation Plan and this Site-specific Reclamation Plan apply to federal lands. While the preference is to use these procedures and standards on private lands and state lands, specific reclamation procedures and standards on private lands and state lands may vary and will be developed in coordination with private landowners, the Wyoming Industrial Siting Council, the State Land Board and the Wyoming Game and Fish Commission (WGFC), as appropriate. This Site-Specific Reclamation Plan is intended to be adaptive to take into account changing conditions and technologies. PCW, in coordination with the BLM Authorized Officer (AO), may update, modify, or change the procedures contained in this Plan if warranted due to site conditions or other factors.

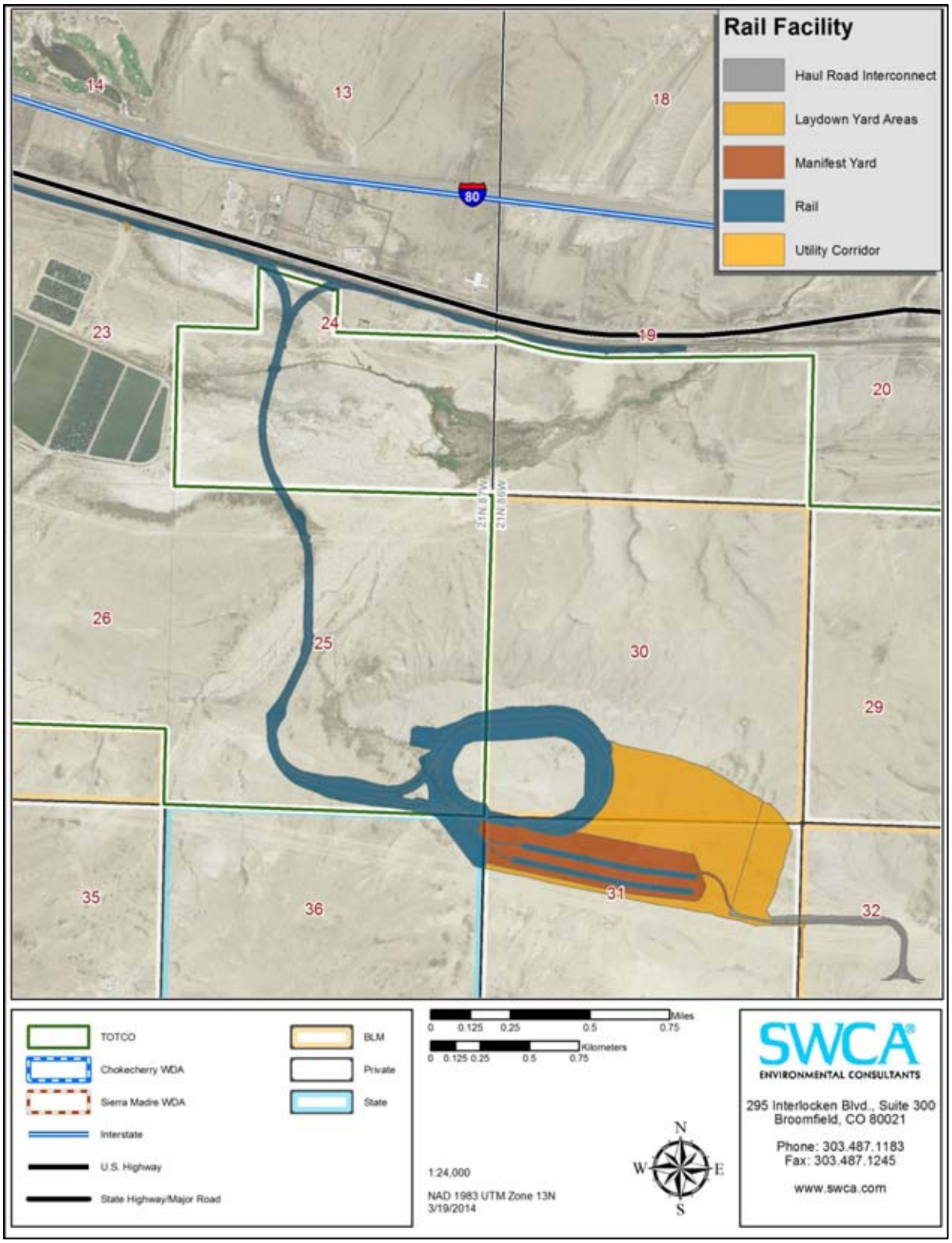

Figure 1. Overview of the West Sinclair Rail Facility.

1.1 DEFINITIONS, OBJECTIVES AND SUCCESS STANDARDS

The Master Reclamation Plan for the CCSM Project defines reclamation goals, objectives and success standards for the CCSM Project; including initial stabilization, interim reclamation and final reclamation (BLM 2012a). This section reiterates those objectives and success standards.

Reclamation is defined in the CCSM Project Master Reclamation Plan as the rehabilitation of a disturbed area to make it acceptable for designated use. Reclamation measures are intended to ensure that biophysical conditions are maintained in the short term to achieve long-term goals of revegetation and ecosystem reconstruction.

In accordance with the CCSM Project Master Reclamation Plan, PCW will stabilize soils and control erosion for all disturbed areas immediately after surface disturbance occurs. Following initial stabilization, PCW will initiate interim reclamation for those areas that are not required for routine operations and maintenance, but which may be re-disturbed during non-routine activities or decommissioning. The objective of interim reclamation is to maintain a healthy, biologically active topsoil; control erosion; minimize visual impacts; and, reduce habitat and forage loss until final reclamation is initiated. PCW will reclaim wetlands per the requirements of the Clean Water Action section 404 permit from the Corps of Engineers.

For areas that will not be re-disturbed during operations and maintenance, and for all other areas following decommissioning, PCW will proceed with final reclamation as soon as practicable. The objective of final reclamation is to return the land to a condition approximating that which existed prior to disturbance with allowances for an improved and/or stable ecological condition where possible. This includes reconstruction of the landform to its original state along with re-establishment of a stable vegetative community, hydrologic systems, visual resources, agricultural values, and wildlife habitats.

The success of reclamation on federal lands will be measured against the standards set out in the BLM Rawlins Field Office Resource Management Plan (BLM 2008) and the CCSM Project Master Reclamation Plan, as further clarified in the Monitoring and Reporting Plan (Attachment A). These success standards address soil handling, drainage and erosion control, revegetation, invasive plants and noxious weeds, and landscape reconstruction.

2.0 PRE-DISTURBANCE SITE CHARACTERIZATION

As discussed in the CCSM Project Master Reclamation Plan, pre-disturbance site characterization is critical for reclamation monitoring purposes to describe the surrounding landscape, determine ecological community types, and assess biophysical parameters. To complete pre-disturbance site characterization for the Rail Facility, PCW used soil surveys, vegetation data, aerial imagery, climate information, and other natural features to delineate the ecological sites that occur within the limits of disturbance of the Rail Facility. Vegetation and soil surveys were conducted in 2009 and 2013 for the Rail Facility to ensure that each identified ecological site is appropriately classified.

The baseline information collected includes topographic, hydrologic, vegetation, and soil parameters. Methods for the pre-disturbance characterization and reclamation success monitoring are consistent with the methods used by NRCS to develop ecological sites (Caudle et al. 2013; Herrick et al. 2009; Schoeneberger et al. 2012) and are provided in Attachment A. The vegetation and soils data collected as part of the pre-disturbance site characterization were used to develop ecological site reclamation implementation plans for each ecological site (Attachment B). These plans contain the detailed site-specific information necessary to conduct reclamation. Through this process, PCW also identified ecological sites and other areas that may have limited reclamation potential (LRP). Prior to construction, PCW will establish undisturbed reference sites in coordination with the BLM AO, to evaluate reclamation success. Current pre-construction evaluation sites may be selected as final reference sites if they provide the representative conditions (i.e., site conditions are consistent with the variability described for each ecological site) and are located outside of the Project limits of disturbance.

2.1 ECOLOGICAL SITE DELINEATION

An ecological site is a specific type of land defined by its physical characteristics that differs from other communities within a landscape in its ability to produce and support a distinctive type and amount of vegetation, and in its ability to respond similarly to management actions and natural disturbances (Natural Resources Conservation Service [NRCS] 2013). NRCS approved ecological site descriptions have not been published for areas within the CCSM Project Site. The NRCS has not published soil data and approved ecological sites for the reclamation area; as a result, ecological sites were delineated from the best available biophysical parameters for the reclamation area and supported through ground surveys (Attachment B). PCW described ecological sites for the CCSM Project area using a spatially implicit modeling approach that incorporated spatially available vegetation, soil, and digital elevation model (DEM) data. The model was further ground-truthed and supplemental data was gathered at 126 sampling and monitoring locations spatially distributed throughout the CCSM Project Site. Ecological sites are identified according to their predominant soil texture and the precipitation zone they occur in ("*Soil Texture*", "*Precipitation Zone*" site – e.g., *Clayey 7-9 Inch site*).

Biophysical and climatic parameters have been characterized in the disturbance area to delineate ecological sites, assess pre-disturbance conditions, and determine ecological site-specific seed mixtures for revegetation (Attachment B). Four ecological sites in a 7-9 inch precipitation zone (NRCS 2012) occur within the limits of disturbance for the Rail Facility: *Clayey 7-9 Inch sites*; *Sandy 7-9 Inch sites*; *Saline Upland 7-9 Inch sites*; and, *Saline Lowland 7-9 Inch sites*. Descriptions for each ecological site are included in Attachment B. Figure 3 below illustrates the distribution of each ecological site within the limits of disturbance of the West Sinclair Rail Facility.

2.2 REFERENCE SITES

As discussed in the CCSM Project Master Reclamation Plan, reference sites document the site characteristics necessary to evaluate reclamation success standards and serve as a reference to

the surrounding landscape and ecological community types within the disturbance area. Reference sites for each ecological site occurring in the Rail Facility will be established in the growing season prior to initial surface disturbance in coordination with BLM resource specialists. A minimum of three reference sites will be established prior to surface-disturbing activities for each ecological site. Final reference sites will be determined in coordination with the BLM AO. Multiple reference sites for each ecological site account for local variability in vegetation, soil, and climatic conditions and provide a range of vegetation and soil baseline standards to assess reclamation success. In addition to reference sites, characterizations will be completed at select locations within the disturbance area to further verify that the disturbance area is similar in character to the selected reference site(s). To characterize each reference and disturbance verification site, PCW will use the standardized protocols for vegetation sampling, soil sampling, and site description (Attachment A).

Each disturbance area for the Rail Facility is assigned to one or more ecological sites, as detailed in Figure 3. Following establishment of the reference sites, each reference site will be associated with an ecological site, and thus one or more disturbance areas. The reference sites associated with the disturbance areas will be used to assess reclamation success.

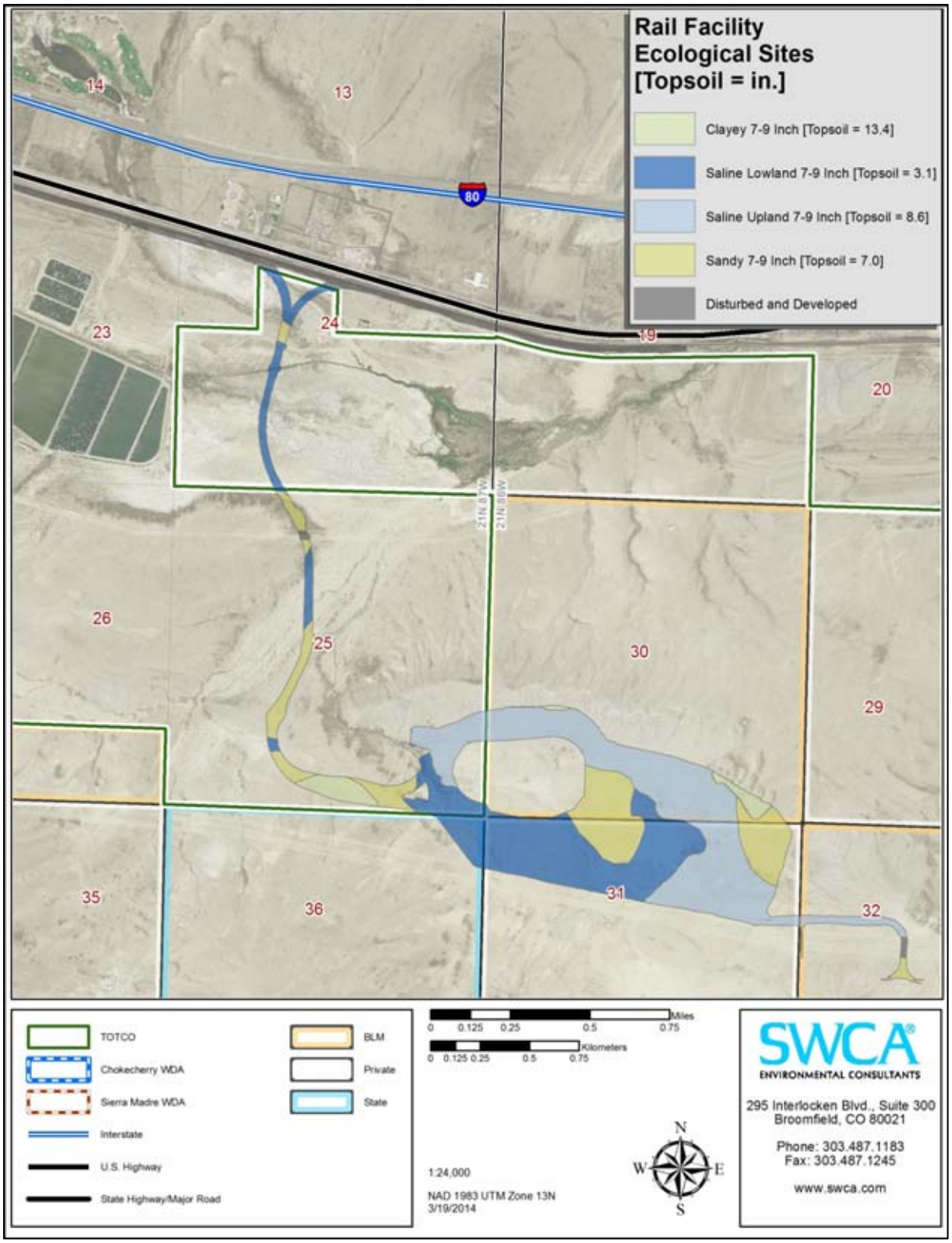

Figure 2. Overview of ecological sites within the Rail Facility.

2.3 SOIL CONDITIONS

Soil depths, composition, textures, colors, and other physical and chemical properties, have been evaluated during soil surveys for the Rail Facility and geotechnical testing. Attachment B describes the soil conditions for each ecological site in the Rail Facility Site per the requirements of the BLM Wyoming Reclamation Policy (BLM 2012b) and the Rawlins Field Office Reclamation Plan template (BLM 2011). Attachment B contains physical, chemical, and biological soil attributes for each ecological site that occurs within the Rail Facility Site.

Soils within the Rail Facility are primarily derived from sedimentary formations and are predominantly orthents; soils that are shallow to very deep, medium to fine textured, have a frigid temperature regime, an aridic moisture regime, and mixed or bentonitic mineralogy. Geotechnical testing indicates that the Rail Facility is underlain by deep alluvial fine-textured soils. Depth to bedrock is generally 20 feet or greater.

Soils adjacent to the Union Pacific railroad are characterized by 2 to 5 feet of construction fill material (likely from other industrial development in the corridor) overlaying deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. Bedrock was not encountered during geotechnical testing in the area adjacent to the Union Pacific railroad. The remaining areas of the Rail Facility Site south of the Union Pacific railroad corridor are characterized by deep alluvial silts, clays, and sands with slight amounts of gravel and organics and evidence of alkali staining. No fill materials are present in the soils south of the railroad corridor. Bedrock of the Steele Shale Formation was encountered at locations in the southern third of the Rail Facility Site at depths generally in the range of 20 to 25 feet below ground surface.

2.4 PRE-DISTRUBANCE VEGETATION COMPOSITION

The Rail Facility Site is primarily characterized by areas of salt desert shrub and sagebrush steppe (Figure 3). Sparsely vegetated, grassland, riparian, and barren communities are also present in the Rail Facility Site, but make up only a small percentage of the vegetation communities. Vegetation communities were confirmed by SWCA Environmental Consultants (SWCA) in 2012 and 2013 across the CCSM Project Site, including the areas surrounding the Rail Facility. Table 1 includes a summary of the vegetation communities within the Rail Facility Site.

Table 1. Vegetation Communities within the Rail Facility Site.

Vegetation Community	Acreage	Percentage
Shadscale saltbush	116.1	31.4%
Gardner's saltbush/greasewood	79.1	21.4%
Wyoming big sagebrush/threadleaf sedge	38.5	10.4%
Wyoming big sagebrush/greasewood	23.0	6.2%
Shadscale saltbush/Wyoming big sagebrush	21.7	5.9%
Gardner's saltbush	20.9	5.6%

Vegetation Community	Acreage	Percentage
Greasewood/saltbush/basin big sagebrush	15.1	4.1%
Threadleaf sedge	5.9	1.6%
Wyoming big sagebrush/bird's foot sagebrush	5.4	1.5%
Other[1]	13.2	3.6%
Disturbed/developed	31.1	8.4%
TOTAL	370.0	100.0%

Notes:

(1) Greasewood, shadscale saltbush/black sagebrush, Wyoming big sagebrush/rabbitbrush, and greasewood/saltgrass each make up less than 1 percent of the total acreage of the Rail Facility Site

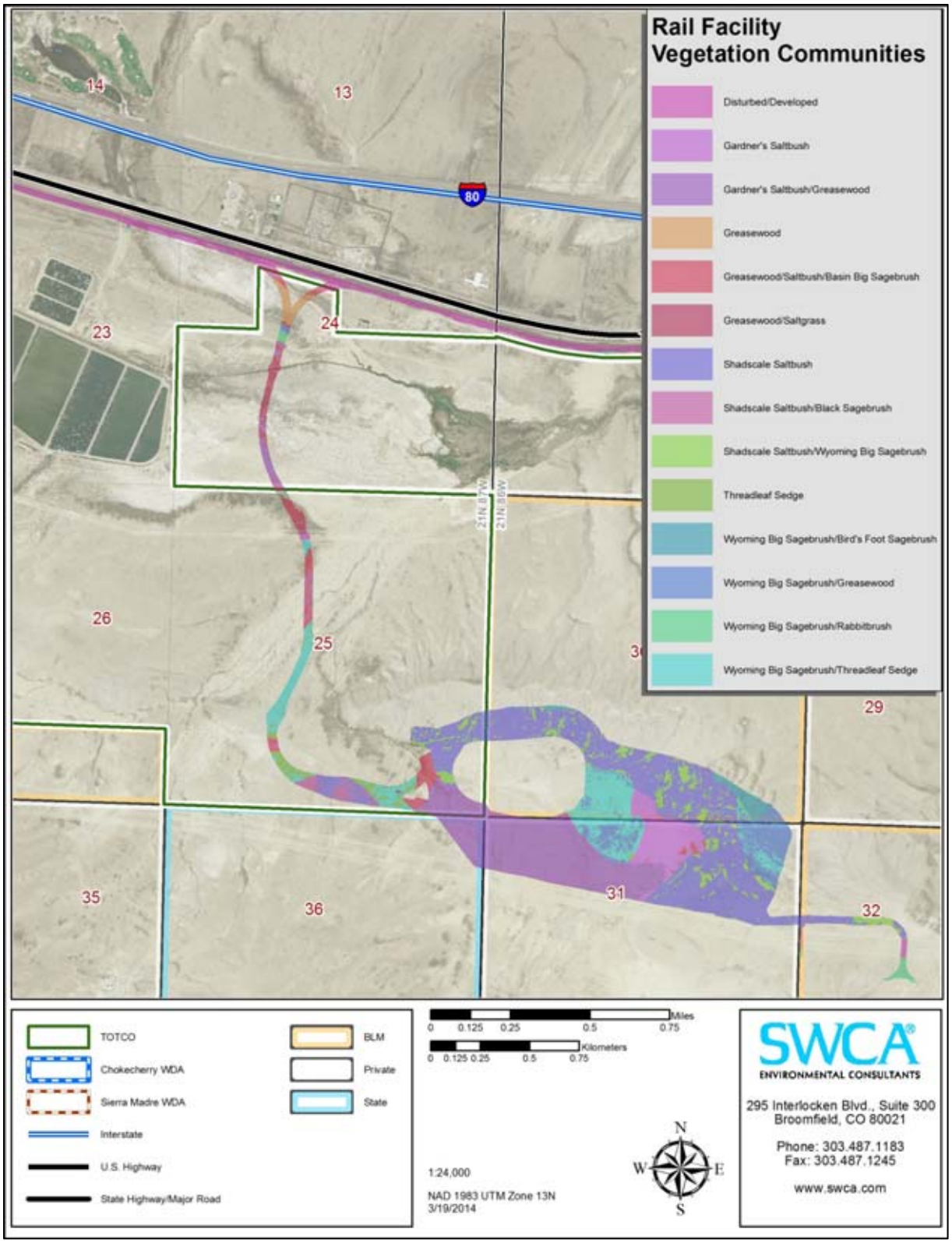

Figure 3. Overview of vegetation within the Rail Facility.

2.4.1 Saltbush (*Atriplex* spp.) Communities

The saltbush (*Atriplex* spp.) cover type is dominated by Gardner's saltbush (*A. gardneri*) and shadscale (*A. confertifolia*). Gardner's saltbush is a subshrub, which is woody at its base and seldom grows higher than 16 inches. It grows on alkaline soils of barren plains and hills. Shadscale is a relatively compact spiny shrub, also tending to grow in alkaline soils on plains and hills. Shadscale normally grows in dense clumps and ranges from 1 to 3 feet in height (Simonin 2001).

Gardner's Saltbush (*Atriplex gardneri*) Communities

Gardner's saltbush is most commonly found on saline, poorly developed, or clayey soils with a pH ranging from 7.8 to 8.6 (NatureServe 2014). Pure stands of Gardner's saltbush generally occur on Saline Lowland, Clayey, Saline Upland Ecological Sites. Soils are typically low in available phosphorous, nitrogen and potassium. Gardner's saltbush also grows on sodic, silty or sandy soils, usually on harsh and arid sites (generally 7-9 inch precipitation zones), with widely fluctuating temperatures and high winds. Gardner's saltbush is a spreading, low growing, evergreen, perennial member of the goosefoot family (Chenopodiaceae). It is often called a sub-shrub being woody at the base. It grows from 8-20 inches in height and has alternate, gray-green leaves up to 2 inches long. The plant has a highly branched deep root system, with lateral spread up to 7 feet. The species tolerates poor site conditions and is used to stabilize soils and to reclaim disturbed areas.

Gardner's Saltbush/Greasewood (Sarcobatus vermiculatus)
This sub-association is generally found on Saline Lowland and Clayey Ecological Sites in 7-9 inch precipitation zones. Black greasewood (*Sarcobatus vermiculatus*) can occur in pure stands or in association with saltbush species (NatureServe 2014). Greasewood is a native flowering perennial, with an erect to low growing growth form that can reach 10 feet tall and 3-6 feet across. Greasewood is halophytic and associated with saline and alkaline soils with a pH ranging from 6.2-9.8. This association occurs on moderately steep to steep eroded slopes or on toeslopes composed of clay or shale sediments. The majority of the ground surface (80%) is comprised of bare ground and gravels. The vegetation is characterized by a sparse to moderately dense (20-40% cover) woody layer co-dominated by Gardner's saltbush and greasewood. Other shrubs and dwarf-shrubs include scattered basin big sagebrush, bud sagebrush *(Picrothamnus desertorum),* shadscale saltbush *(Atriplex confertifolia),* rubber rabbitbrush *(Ericameria nauseosa),* broom snakeweed (*Gutierrezia sarothrae),* winterfat (*Krascheninnikovia lanata*), Pursh seepweed (*Suaeda calceoliformis),* and spineless horsebrush (*Tetradymia canescens)*. If present the graminoid layer is typically sparse and may include Sandberg bluegrass (*Poa secunda*), Indian ricegrass (*Achnatherum hymenoides),* bottlebrush squirreltail (*Elymus elymoides)*, and the introduced annual- cheatgrass (*Bromus tectorum)*. The forb layer is made up of annual species and therefore varies in cover and composition. Common perennial forbs include hoary tanyaster (*Machaeranthera canescens),* povertyweed (*Iva axillaris),* and textile onion (*Allium textile)*.

Shadscale Saltbush (*Atriplex confertifolia*) Communities

These open to sparse shrublands are dominated by shadscale saltbush but lack other diagnostic species (NatureServe 2014). These communities are widespread across western and central Wyoming. Pure stands of shadscale saltbush may occur on Saline Upland, Clayey, Sandy, Loamy, or Shale Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. In general stands occur on hills, ridges, and toeslopes, where soils are often shallow clays or clay loams (and occasionally sandy soils) derived from marine shales, with a high percentage of bare ground and gravel at the surface. Vegetation cover is generally sparse, not exceeding 35%. The short-shrub canopy is dominated by shadscale saltbush with other associated species, including buckwheat, Gardner's saltbush, yellow rabbitbrush, and shortspine horsebrush. The herbaceous layer varies from sparse to relatively dense, and may comprise Indian ricegrass, bluebunch wheatgrass, and Sandberg bluegrass.

Shadscale Saltbush/Black Sagebrush (Artemisia nova)
This sub-association occurs on Shale, Sandy, and Shallow Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This plant association typically has sparse vegetation cover, and low plant diversity (NatureServe 2014). Shrubs are typically scattered with wide interspaces and few herbaceous understory species; biological soil crusts are sometimes prevalent. Shadscale and black sagebrush communities may form a mosaic with the black sagebrush dominating on lower elevations, less saline and less alkaline sites than shadscale saltbush.

Shadscale Saltbush/Wyoming Big Sagebrush (Artemisia tridentata *ssp*. wyomingensis)
This sub-association may occur in Saline Upland, Shale, Loamy, and Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This sub-association is found irregularly in xeric, alkaline sites where slopes tend to be gentle to moderate, and the relatively deep, alkaline soils may be modified by a thin layer of alluvial or colluvial deposits (NatureServe 2014). Stands are codominated by shadscale saltbush and Wyoming big sagebrush. The understory tends to be sparse and inconsistent in its composition.

2.4.2 Greasewood Communities

Black greasewood is a native flowering perennial with an erect to low spreading growth form reaching 10 feet tall and 3-6 feet across (NatureServe 2014). On saline sites greasewood may grow in nearly pure stands or in association with saltbushes (*Atriplex* spp.). Greasewood typically occurs in areas receiving 3-20 inches of annual precipitation and is often confined to alkali-sodic soils in alluvial areas, floodplains, dry washes, and gullies where soil moisture is high. Soil pH typically ranges from 6.2 to 9.8 and surface soils are typically rich in sodium and other cations. Pure stands of greasewood occur primarily on Saline Lowland and Saline Upland Ecological Sites where the water table remains high enough to maintain vegetation, despite salt accumulations. This community usually occurs as a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood. Other shrubs that may be present or codominant in some occurrences include shadscale saltbush, Gardner's saltbush, Wyoming big sagebrush (*Artemisia tridentata* ssp.

wyomingensis), basin big sagebrush, silver sagebrush (*Artemisia cana* ssp. *cana)*, or winterfat. Occurrences are often adjacent to mixed salt desert scrub or big sagebrush shrublands. Graminoids dominate the herbaceous layer, when present; common species include alkali sacaton (*Sporobolus airoides),* western wheatgrass, saltgrass *(Distichlis spicata)*, bluegrass (*Poa* sp.*),* Nuttall's alkaligrass *(Puccinellia nuttalliana)*, or common spikerush (*Eleocharis palustris).*

Greasewood/Saltbush/Basin Big Sagebrush (*Artemisia tridentata* ssp. *tridentata*)

This sub-association occurs on Saline Lowland, Sandy, Loamy, and Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association is characteristic of stream terraces and floodplains and the presence of other shrubs in the canopy indicates less saline conditions than pure stands of greasewood (NatureServe 2014). Soils are typically saline, deep and generally sandy, but a few sites are on well-drained silt loams or clays. Total shrub cover for this association is typically between 5 and 30%. The typical sagebrush element is basin big sagebrush but Wyoming big sagebrush may also occur. The sagebrush and the greasewood component can vary in terms of their cover dominance. Four-wing saltbush is also co-dominant with rubber rabbitbrush and yellow rabbitbrush (*Chrysothamnus viscidiflorus)* as other common minor elements of the shrub canopy. Understory cover varies from sparse to dense and non-native species may persist.

Greasewood/Saltgrass (*Distichlis spicata*)

This sub-association occurs mainly on Saline Lowland Ecological Sites in 7-9 inch precipitation zones. This association is found on broad floodplains, along large rivers and streams, on the margins of upland seeps, and often occurs around playas dominated by saltgrass (NatureServe 2014). Sites typically undergo intermittent flooding and substrates are deep, alkaline, saline and generally have fine-textured soils with a perennial high water table. The association is characterized by a fairly open to moderate shrub canopy (18-60% cover) dominated by greasewood with a herbaceous layer dominated by saltgrass (10-80% cover). Other associated shrubs and dwarf-shrubs may include rubber rabbitbrush, broom snakeweed, and spineless horsebrush. The graminoid layer may include alkali sacaton, mountain rush (*Juncus balticus)* and basin wildrye (*Leymus cinereus).* The forb layer is typically sparse, though may be dominated by seepweed (*Suaeda* sp.*),* povertyweed, and ipomopsis (*Ipomopsis* spp.).

2.4.3 Wyoming Big Sagebrush Communities

Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is a variety of big sagebrush and is closely related to mountain big sagebrush. Wyoming big sagebrush overlaps in range and elevation with basin big sagebrush (NatureServe 2014). Plants are considerably smaller than those of basin big sagebrush, usually less than 0.9 m tall, and have main stems branching from the ground. Flowering stems are not as widely branching as those of the basin variety, but otherwise closely resemble that subspecies. Leaves are typically shorter, from 1 to 1.5 cm long, and flabelliform. The range of mountain big sagebrush and Wyoming big sagebrush overlap and are known to hybridize with each other.

Pure stands of Wyoming big sagebrush mainly occur on Loamy Ecological Sites, with some on Sandy and Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. Wyoming big sagebrush steppe communities are prevalent in the West (NatureServe 2014). The species is a native long-lived shrub, generally 18-30 inches tall with rounded uneven crowns. The species typically occurs on foothills, undulating terraces, slopes and plateaus but also occurs in basins and valley bottoms. It is most commonly found on frigid, mesic, and xeric soils of silty, clayey, skeletal and mixed textures. Soil pH varies from moderately acidic to moderately basic. Species diversity is relatively low in Wyoming big sagebrush communities; common associates may include fringed sagebrush, broom snakeweed, western wheatgrass, Sandberg bluegrass, bluebunch wheatgrass, bottlebrush squirreltail, Idaho fescue (*Festuca idahoensis*), Thurber needlegrass (*Achnatherum thurberianum*) and needle-and-thread grass.

Wyoming Big Sagebrush/Bird's Foot Sagebrush (*Artemisia pedatifida*)

This sub-association occurs entirely on Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association commonly occurs on alkaline clay and clay-loam soils (NatureServe 2014). The Wyoming big sagebrush component tends to grow on the shallowest, most well-drained, and hottest soils of the site. Common understory associates include Indian ricegrass, needle-and-thread, threadleaf sedge, Idaho fescue, bottlebrush squirreltail, bluebunch wheatgrass, fringed sagebrush, and winterfat.

Wyoming Big Sagebrush/Greasewood

This sub-association mainly occurs on Clayey and Shallow Clayey Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. This association is characteristic of valley bottom positions and the presence of other shrubs in the canopy indicates less saline conditions than pure stands of greasewood (NatureServe 2014). Soils are typically saline, deep and generally sandy, but a few sites are on well-drained silt loams or clays. Total shrub cover for this association is typically between 5 and 30%. The typical sagebrush element is Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis),* but basin big sagebrush (*Artemisia tridentata ssp. tridentate)* may also occur. The sagebrush and the greasewood component can vary in terms of their cover dominance. Four-wing saltbush (*Atriplex canescens),* is also co-dominant with rubber rabbitbrush (*Ericameria nauseosa)*, and yellow rabbitbrish (*Chrysothamnus viscidiflorus)* as other common minor elements of the shrub canopy. Understory cover varies from sparse to dense and non-native species may persist.

Wyoming Big Sagebrush/Yellow Rabbitbrush (Chrysothamnus viscidiflorus)

This sub-association occurs on Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. Yellow rabbitbrush is a native perennial, warm season shrub that grows 1-3 feet in height (NatureServe 2014). It inhabits dry open areas on plains, valley bottoms, foothills and mountains. This association occurs on sites that are flat to gently sloping. The ground surface has moderate to high cover of bare soil and litter. The vegetation is characterized by a relatively open (25% cover) shrub canopy co-dominated by Wyoming big

sagebrush and yellow rabbitbrush with a sparse herbaceous layer. Other shrubs and dwarf-shrubs may be present including fringed sagebrush, rubber rabbitbrush, and greasewood. Herbaceous vegetation is typically sparse but may include threadleaf sedge, bottlebrush squirreltail, and basin wildrye.

Wyoming Big Sagebrush/Threadleaf Sedge (*Carex filifolia*)

This sub-association generally occurs on Sandy Ecological Sites in 7-9 inch and 10-14 inch precipitation zones. The Wyoming big sagebrush component occurs in an open shrub canopy, while threadleaf sedge is abundant in the understory (NatureServe 2014). Other common understory associates include needle-and-thread, plains prickly pear, woolly pod milkvetch *(Astragalus purshii),* and hooded phlox (*Phlox hoodii).*

2.4.4 Threadleaf Sedge Communities

The threadleaf sedge upland grassland community occurs entirely on Sandy, Shallow Sandy, and Gravelly Ecological Sites in 7-9 and 10-14 inch precipitation zones. Threadleaf sedge is a cool-season, sod-forming, drought-resistant, low-growing, native perennial graminoid (NatureServe 2014). It grows in bunches approximately 4-6 inches in width. The sedge is commonly found on warm, dry, well drained sites on upper south-facing slopes or dry open spaces and dry meadows. It grows in well drained silty-clay loam and fine sandy loam soil and can tolerate some saline soils. Threadleaf sedge is an important grass-like forage species, particularly during its early growth and high palatability in the spring when it provides high levels of protein. Common components of the threadleaf sedge community may include blue grama (*Bouteloua gracilis)*, western wheatgrass, needle-and-thread (*Hesperostipa comata*), bluebunch wheatgrass, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), and fringed sagebrush (*Artemisia frigida*).

2.5 LIMITED RECLAMATION POTENTIAL AREAS AND SENSITIVE SOILS

The BLM defines LRP areas and sensitive soils as sites that are particularly difficult to restore due to highly sensitive physical, biological, and/or chemical characteristics (BLM 2012b). The BLM uses the following criteria, relevant to the Rail Facility Site, to identify potential LRP areas:

- Slopes greater than 25% on south or southwest facing aspects;
- Rock outcrops;
- Marine shale and seleniferous geological substrates;
- Vegetation communities dominated by salt-loving (halophytic) plant species or other sensitive plant communities;
- Noxious and invasive weed species; or
- Annual precipitation less than nine inches.

PCW has identified and avoided LRP areas in the vicinity of the Rail Facility to the extent practicable, in accordance with the requirements of the ROD (BLM 2012a). Where avoidance is not practicable, best management practices (BMPs) and other strategies designed to address

site-specific conditions of the Rail Facility Site will be implemented to increase reclamation success (Attachment B). PCW has addressed the potential LRP areas within the Rail Facility Site as follows:

- PCW used LiDAR topography data to determine slopes within the CCSM Project Site, including the Rail Facility Site. PCW has avoided disturbance on terrain with slopes greater than 25% in the Rail Facility Site.
- PCW used geologic analysis, aerial photography, and ground observations to identify rock outcroppings in the Rail Facility Site. No rock outcroppings were observed and geotechnical surveys indicate that paralithic bedrock occurs well below the soil surface (greater than 10 feet) throughout the Rail Facility Site. Based on this information, PCW determined that rock outcroppings are not likely to be disturbed at the Rail Facility Site.
- The underlying geologic substrate within the Rail Facility Site potentially supports the occurrence of marine shales (Fugro 2013). PCW has designed the Rail Facility to avoid mapped shale ecological sites; therefore, impacts are not anticipated (Figure 3).
- Seleniferous soils and sensitive plant communities have been identified and avoided to the extent practicable. To the extent these conditions could not be avoided or if they are further encountered during construction, they will be flagged by the Environmental Inspector prior to surface disturbing activities and the appropriate BMPs and strategies will be implemented to increase reclamation success (Attachment B).
- Noxious and invasive weeds have been identified in the Rail Facility Site (Rail Facility Site-specific Plan of Development – Appendix J). Noxious and invasive weeds that have been identified will be controlled in accordance with the CCSM Project Weed Management Plan. Noxious and invasive weed occurrences will be flagged by the Environmental Inspector prior to surface disturbing activities and the appropriate BMPs and strategies will be implemented to increase reclamation success (Attachment B).
- The entire Rail Facility Site, and most of the CCSM Project Site, has annual precipitation less than nine inches per year; therefore these areas could not feasibly be avoided. Soil handling techniques, site preparation techniques, and seeding techniques will be implemented to account for arid conditions (Attachment B).

In summary, the potential LRP areas with the greatest limitations identified in the Rail Facility Site are areas of hypersaline and/or seleniferous soils (Figure 2 – Saline Lowland 7-9 Inch ecological sites), including the associated sensitive plant communities (i.e., halophytic plant species) that are closely associated with these sites. Plant species within these ecological sites (saltbush [*Atriplex* spp.], greasewood [*Sarcobatus vermiculatus*], grooved milkvetch [*Astragalus bisulcatus*], and woodyaster [*Xylorhiza glabriuscula*]) indicate high salt and or selenium content. Best management practices and other strategies will be implemented to increase reclamation success, including providing proper soil handling techniques and seed mixes to promote the re-establishment of sensitive plant communities (Attachment B).

Additional LRP areas and sensitive soils may be identified during construction activities. These sites will be identified by the environmental compliance monitor and reported to the compliance manager and BLM AO immediately prior to additional surface-disturbing activities. LRP areas and sensitive soils may include: rock outcroppings and limiting geological substrate (e.g., marine shale, clay/siltstone, seleniferous parent material); shallow topsoil depths (less than 3 inches); potential sodic soils and heightened sodium absorption ratios (SARs); extremely coarse (i.e., sand dunes) or fine textures (i.e., massive clay features); and, limiting plant communities (e.g., halophytic plants, selenium accumulators, noxious and undesirable plant species, and unique plant communities). In the event of identifying or determining site-specific LRP areas or sensitive soils, additional LRP/sensitive soil BMPs and protective measures will be implemented in coordination with the BLM AO (Attachment B). Following the implementation of reclamation and monitoring, if reclamation standards are not being met in LRP areas, PCW will implement additional site-specific BMPs and protective measures (e.g., topsoil amendments, soil remediation, weed control, etc.) as needed and in coordination with the BLM AO.

3.0 SURFACE-DISTURBING ACTIVITIES

The Site-specific Plan of Development for the Rail Facility includes details of the Rail Facility design and the location of all surface-disturbing activities. Reclamation will begin immediately following construction with initial stabilization followed by interim and final reclamation, as appropriate. The Site-specific Plan of Development provides additional information on the Rail Facility components that are discussed below.

3.1 FACILITY DESIGN

The Rail Facility will disturb approximately 377.0 acres initially and 121.2 acres long-term (Table 2). The Rail Facility components include the Wye Track, Running Track, Lead Track, Loop Track, other unloading tracks, laydown areas, and access roads.

Table 2. Initial and Long-term Disturbance for the Rail Facility.

Ecological Site	Initial Disturbance (acres)	Long-term Disturbance (acres)			
		Road	Laydown Yards	Rail	Total
Saline Upland 7-9 Inches	133.2	3.0	7.4	13.3	23.8
Saline Lowland 7-9 Inches	119.3	0.0	37.5	25.2	62.7
Sandy 7-9 Inches	72.9	0.8	5.9	11.8	18.5
Clayey 7-9 Inches	14.3	0.0	0.0	3.6	3.6
Developed/Disturbed	30.4	0.3	0.0	12.3	12.6
Grand Total	**370.0**	**4.1**	**50.8**	**66.3**	**121.2**

The design documentation for the Rail Facility includes infrastructure locations, initial and long-term disturbance areas, and information on soil management and drainage crossings (Rail Facility Site-specific Plan of Development - Appendix B). The overall goal of soil management is to maintain site balance of the soil resource. Salvaged soil will be removed as cut, used as fill, or stockpiled for future reclamation (interim and final reclamation). Overall, the Rail Facility has a net total balance of cut and fill (Table 3). Topsoil from the cut will be salvaged and used in the immediate area for reclamation purposes. Excess subsoil not used as fill will be hauled and stockpiled at the Road Rock Quarry for use as reclamation fill (Section 4.1.3).

Table 3. Cut and Fill Earthwork Summary for the Rail Facility

Rail Facility Component	Total Cut	Total Adjusted Fill	Net [Long / (Short)]
	C.Y.	C.Y.	C.Y.
Union Pacific Running Track	75,000	277,000	(202,000)
Union Pacific Wye Track	7,000	82,000	(75,000)
Lead Line (23+48 to 99+00)	69,000	142,000	(73,000)
Loop Area (from 99+00)	590,000	496,000	94,000
Rail Access Road	20,000	16,000	4,000
Laydown Areas	849,000	597,000	252,000
Total	**1,610,000**	**1,610,000**	**0**

*C.Y. = cubic yard

4.0 SOIL MANAGEMENT

Components of soil management include soil handling, landscape reconstruction, and erosion control. Soil will be managed in accordance with the CCSM Project Master Reclamation Plan (BLM 2012a) and BLM Wyoming Reclamation Policy (BLM 2012b), as further detailed below.

4.1 SOIL HANDLING

Surface disturbing activities at the Rail Facility include clearing existing vegetation, stripping topsoil, extracting subsoil, and backfilling and grading. Soil for the Rail Facility will be managed in accordance with the CCSM Project Master Reclamation Plan (BLM 2012a) and BLM Wyoming Reclamation Policy (BLM 2012b) including provisions for segregating and marking stockpiles, and protecting stockpiled material from erosion, contamination and degradation. Each type of surface disturbing activity is described below. PCW will apply BMPs, as described in Section 4.4 during surface disturbing activities.

4.1.1 Vegetation Clearing

PCW will perform vegetation clearing in areas of ground disturbance as appropriate based upon the vegetation characteristics and design requirements. Where possible, vegetation clearing will be performed a few days prior to topsoil stripping. PCW anticipates vegetation clearing, as follows:

- PCW will strip topsoil in areas that contain relatively low and sparse native grasses without significant amounts of woody shrubs without performing vegetation clearing so that the native vegetation is mixed directly into the stripped topsoil.
- In areas where the amount of native grasses would hinder topsoil stripping, the height of the vegetation will be first be reduced by mowing the area, typically with a tractor pulled brush hog (Figure 4 [left]), allowing the clippings to remain with the topsoil during the stripping process.
- Areas with higher concentrations of woody brush will be cleared first by cutting and mulching the vegetation prior to stripping the topsoil. Cutting and mulching is commonly done with a skid steer equipped with a clearing and mulching attachment (Figure 4 [right]). The mulch will remain with the topsoil during the stripping process.
- For areas with very dense vegetation including wooded areas, PCW may push vegetation to the limits of disturbance using bulldozers or similar equipment prior to stripping topsoil. Once the topsoil storage piles are established, PCW would chip and mulch the vegetation and place it on top of the topsoil storage piles for purposes of stabilization.

Figure 4. Typical Vegetation Clearing Equipment

4.1.2 Topsoil Stripping and Stockpiling

As discussed in Section 2.1, PCW has determined that four ecological sites exist within the Rail Facility Site (Figure 2):

- Clayey 7-9 Inch ecological site;
- Saline Lowland 7-9 Inch ecological site;
- Saline Upland 7-9 Inch ecological site; and,
- Sandy 7-9 Inch ecological site.

Topsoil boundaries and depth have been delineated during the ecological site mapping process and will be used to inform topsoil stripping and stockpiling (Table 4; Figure 2). To minimize soil horizon mixing and loss of topsoil integrity, for those ecological sites listed in Table 2 with an average topsoil depth greater than 6 inches, PCW will salvage the top 6 inches of topsoil within the ecological site boundaries shown in Figure 2 (and within the tolerance of the stripping equipment, discussed below). For those ecological sites listed in Table 2 with an average depth less than 6 inches, PCW will salvage the top 3 inches of topsoil within the ecological site boundaries shown in Figure 2 or to a maximum depth in soils limited by a restrictive layer within the top 6 inches (Table 4). When the topsoil depth is greater than 6 inches, PCW will generally not salvage to the soil horizon depth to minimize mixing topsoil with subsoils, and to reduce overall stockpile footprints. However, PCW may elect to remove some additional topsoil for use in interim and final reclamation. Topsoil will not be salvaged from Saline Lowland ecological sites when practicable, and instead soil from all depths will be handled as Saline Lowland ecological site subsoil, to minimize movement of hypersaline soils. Topsoil from Saline Lowland ecological sites with increased organic material may be identified and stripped to 3 inches for use as fill in non-structural areas.

Table 4. Topsoil Depths for the Rail Facility

Ecological Site	Topsoil Texture	Topsoil Depth (in)[1]
Clayey 7-9 Inch	Sandy loam to silty clay	13.4 ± 1.86
Saline Lowland 7-9 Inch[2]	Sandy clay loam to silty clay	3.1 ± 0.40
Saline Upland 7-9 Inch	Sandy loam to clay loam	8.6 ± 2.24
Sandy 7-9 Inch	Loamy sand to silty clay loam	7.0 ± 1.24

[1]Topsoil depth = inches ± 1 standard error
[2]Topsoil will not be salvaged in these ecological sites

When performing topsoil stripping, PCW will set the stripping equipment (typically motor grader or similar) to strip topsoil to the depth discussed above. Typical industry experience is that such equipment has a tolerance of plus or minus 2 to 3 inches due to terrain effects.

Stripped topsoil will be stored in stockpiles segregated by the ecological sites from which they were removed, as defined in Table 2. PCW will establish signage identifying the ecological site membership of each stockpile, and maintain records of the dates of stockpiling, approximate stockpile depth, and applied erosion control measures. Topsoil stockpile locations have been identified in Appendix B of the Rail Facility Site-specific Plan of Development. Topsoil along the running track and lead track of the Rail Facility will be stripped and windrowed at the edge of the temporary disturbance area, while topsoil within the rail loop and laydown yards will be stripped and stockpiled at the edge of the temporary disturbance area. Topsoil stockpiles have been designed to minimize the surface area and to

maintain geomorphic stability. Soil stabilization will be implemented as soon as practicable on topsoil stockpiles. All topsoil stockpiles are located so as not to affect existing drainages.

The stockpiled topsoil will be re-spread on disturbance areas that do not have aggregate or rock following final grading. Stockpiled topsoil from specific ecological sites will be used within the same ecological site or similar ecological sites. If topsoil is used in a different ecological site, the ecological site compatibility will be determined prior to redistribution of topsoil in coordination with the BLM AO. Topsoil that is not used to reclaim temporary disturbance will remain stockpiled for reclamation following decommissioning.

If topsoil is needed for additional reclamation activities and requires movement across ecological site boundaries, ecological site will be noted and ecological site compatibility will be determined in coordination with the BLM AO prior to redistribution of topsoil. Compatible ecological sites may include sites that share the similar predominant soil texture but are located in different precipitation zones (e.g., Sandy 7-9 Inch ecological sites and Sandy 10-14 Inch ecological sites) or sites that have common soil properties but are found in different predominant soil textures (e.g., Clayey 7-9 Inch ecological sites and Shale 7-9 Inch ecological sites).

4.1.3 Subsoil Excavation and Stockpiling

All soils below the stripped topsoil will be handles as subsoil.

PCW has designed the CCSM Project to have a local cut/fill balance wherever possible. Priority is given to having subsoil pushed or transported very short distances to achieve the required site grading. This soil handling practice commonly has the effect of keeping cut and fill subsoil within the same ecological site. However, since the vegetative viability of most ecological sites is not significantly impacted by the subsoil composition, the movement of subsoil between ecological sites (as defined in Figure 2) will occur with the exception of the Saline Lowland ecological sites. Cut is expected in Saline Lowland ecological sites, however, PCW will not use cut from Saline Lowland ecological sites as fill in any other ecological site without coordinating with the BLM AO. Conversely, subsoil from other ecological sites may be cut and used as fill within a Saline Lowland ecological site.

PCW is anticipating an overall net total balance from the Rail Facility; however, subsoil storage may be necessary. Short-term subsoil storage (less than 12 months) for the Rail Facility will occur within the Rail Facility laydown yard area. Subsoil designated to support construction or reclamation of other CCSM Project elements may be located within a Rail Facility laydown yard area or within the limits of disturbance of the additional CCSM Project element to be supported if needed as fill. Longer-term subsoil storage (longer than 12 months) will occur at the Road Rock Quarry's overburden soil storage area.

4.1.4 Backfill and Grading

Once topsoil and subsoil have been removed and any necessary components have been installed, the construction area will be brought to final elevation by backfilling (if necessary) and grading. Backfilling will mostly involve moving soil locally with bulldozers over short

distances. If sufficient subsoil is not available locally to meet the design requirements, PCW will obtain it from nearby subsoil storage piles or the Road Rock Quarry and transport it to the area using dump trucks. Following backfilling, construction areas will be graded to their final elevation and slope. Grading involves placing subsoil using excavators, scrapers, and bulldozers, typically in "lifts" between 6 and 12 inches deep. Each lift will be wet by water truck if required, and compacted using vibratory rollers. Lifts will be applied until the final design grades are achieved. For roads and laydown yards, aggregate will then be applied to surfaces.

4.1.5 Unsuitable Soil

Subsurface soil from beneath controlled fill or within common excavation or subgrade excavation areas may be unsuitable for placement as structural fill. This soil will be removed as part of subgrade correction and will be placed in fill areas or removed from the Rail Facility. If excess soil remains after filling in the uncontrolled fill areas of the Rail Facility, the additional soil will be hauled to the Road Rock Quarry. There will be a designated area within the Road Rock Quarry to store soil unsuitable for uses other than reclamation fill. While the soil is unsuitable for structural fill, this soil is suitable for use in recontouring the Road Rock Quarry during reclamation. If construction sequencing allows, trucks delivering aggregate to the Rail Facility will be loaded with unsuitable fill material for their return trip to the Road Rock Quarry.

4.1.6 Contaminated Soil

Contaminated soils include soils that are subject to a foreign substance during construction and or operation that modifies the chemical properties of the soils to the extent that vegetation re-establishment is not achievable within a reasonable amount of time. Contaminated soils will be handled, transported, and disposed of according to the procedures outlined in the Waste Management Plan (Rail Facility Site-specific Plan of Development – Appendix P and Spill Prevention Control and Countermeasures Plan (Rail Facility Site-specific Plan of Development – Appendix Q). In compliance with BLM Wyoming Reclamation Policy (2012), all hazardous, non-hazardous, special, and general wastes will be segregated and will be disposed of off-site at authorized disposal facilities. No waste will be buried on-site. Hazardous material will be managed and disposed of in accordance with the Waste Management Plan (Rail Facility Site-specific Plan of Development – Appendix P) and the Health and Safety Plan (Rail Facility Site-specific Plan of Development – Appendix R).

4.2 LANDSCAPE RECONSTRUCTION AND EROSION CONTROL

Surface runoff and erosion in areas exposed to surface-disturbing activities will be controlled by reconstructing the landscape to maintain soil stability. The landscape will be reconstructed to achieve a desired topography, slope stability, and surface stability in accordance with the BLM Wyoming Reclamation Policy (2012b) and as detailed in the CCSM Project Master Reclamation Plan (BLM 2012a). In the event that the original topography and landscape will not be reconstructed, PCW will coordinate with the BLM AO and propose alternative landscape designs prior to reconstruction activities.

Water courses and drainage features will be reconstructed, where feasible, to approximate the natural features and hydrologic characteristics of pre-disturbance conditions by maintaining the drainage pattern, profile, and dimension. Slope stability will be controlled by implementing erosion control measures and BMPs to minimize sheet and rill erosion (Rail Facility Site-specific Plan of Development – Appendix H). Surface stability will be accomplished by maintaining soil physical properties and treating compacted surfaces using BMPs. It is anticipated that silt fencing, riprap, mulch cover, and erosion control blankets will be used at the Rail Facility, as detailed in the Erosion Control Plan and Storm Water Pollution Prevention Plan (Rail Facility Site-specific Plan of Development - Appendices H and I). PCW will apply BMPs, as described in Section 4.4 during landscape reconstruction.

4.3 SUBSURFACE INTEGRITY

This section is not applicable to the Rail Facility. No trenching is anticipated.

4.4 SOIL HANDLING BEST MANAGEMENT PRACTICES

PCW will apply soil handling BMPs to the surface disturbing activities associated with the Rail Facility, as indicated in Table 4. Soil handling BMPs are designed and implemented to improve the likelihood of reclamation success. If necessary, the BLM will provide input on remedial actions to further facilitate reclamation success. Administrative BMPs may include soil stabilization measures, contamination remediation, and soil amendments, and will be determined in coordination with the BLM AO.

Table 5. Soil Handling Best Management Practices.

Best Management Practice	Activity				
	Topsoil Stripping	Subsoil Excavation	Stockpiling	Backfill and Grading	Landscape Reconstruction
LRP areas (section 2.5) on federal lands will be avoided to the extent practicable. Where they cannot be avoided, reclamation practices will follow the measures identified for each ecological site (Attachment B).	●	●	●	●	
Topsoil from excavations and construction activities will be salvaged and reapplied during reclamation.	●			●	●
Surface disturbing activities on federal lands will be avoided in unstable areas (e.g., slopes greater than 25%, slumps, landslides, and areas exhibiting soil creep) to the extent practicable.	●	●	●	●	●
Topsoil from each ecological site will be segregated and stockpiled individually.	●		●		
Topsoil from the same ecological site, but different surface disturbances, will be stockpiled together, when practicable, to reduce stockpile locations and minimize additional surface disturbance.	●		●		
Stockpiled topsoil will be used within the same ecological site or another suitable ecological site, in coordination with the BLM AO.				●	●
Stockpiles will generally be located within laydown areas or adjacent to linear features (e.g. roads and transmission rights-of-way) in the form of windrows.	●	●	●		
Subsoil will not be used as topsoil or spread on top of topsoil without laboratory testing of the subsoil physical and chemical characteristics and in coordination with the BLM AO.		●	●	●	
If reclamation success standards are not met, additional BMPs such as soil stabilization measures, contamination remediation, and topsoil amendments will be implemented, in coordination with the BLM AO.			●	●	●

Best Management Practice	Activity				
	Topsoil Stripping	Subsoil Excavation	Stockpiling	Backfill and Grading	Landscape Reconstruction
Stockpiles will be handled according to the measures identified for each ecological site (Attachment B)	●	●	●		
To the extent practicable, topsoil stored longer than 2 years will be piled no more than 2 feet high above native ground conditions (exclusive of native topsoil depth). In locations where limiting the pile to 2 feet would significantly increase the disturbance area, PCW will propose an alternative stockpile design for in coordination with the BLM AO.			●		
If topsoil will be stockpiled for longer than a month, stockpiles will be ridged (roughened) to maximize surface area.			●		
If soil is stockpiled on ground in a different ecological site, the existing native vegetation will be left intact,			●		
Temporary stockpiles stored longer than one growing season (NRCS 1995) will be covered with mulch and/or soil tackifiers to assist in mitigating stockpile wind erosion and contribute organic materials.			●		
Stockpiles stored longer than 2 years will be seeded with a seed mix approved by the BLM AO.			●		
Topsoil and subsoil (including any spoil/unconsolidated parent material) will be stored in separate piles and clearly labeled.	●	●	●		
Permanent and temporary erosion control devices will be installed during construction in accordance with the Erosion Control Plan and Stormwater Pollution Prevention Plan.	●	●	●	●	●
During reclamation, the Rail Facility Site will be recontoured to blend with adjacent topography and will simulate the original topography to the extent practicable.				●	●
Recontoured surfaces will be stabilized and will have adequate surface roughness to reduce surface run-off.				●	●
Pre-disturbance surface drainage patterns will be re-established to minimize erosion and restore the original hydrologic functions to the extent practicable.				●	●

Best Management Practice	Activity				
	Topsoil Stripping	**Subsoil Excavation**	**Stockpiling**	**Backfill and Grading**	**Landscape Reconstruction**
Compacted subsoils will be disked or harrowed prior to reclamation to reduce soil compaction.				•	
Eliminate highwalls, cut slopes, and or topographic depressions, unless approved by BLM AO.				•	•
Avoid or minimize sheet and rill erosion on or adjacent to the reclaimed area by implementing erosion control measures detailed in Appendix H of the Site-Specific Plan of Development.				•	•
Recreate physical characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features to the extent practicable.					•
Construct turnouts, ditches, and water bars, as appropriate, across side slopes at periodic intervals according to slope gradient along recontoured and disturbed slopes.				•	•
Mulch ripped and aerated surfaces with mulch/soil tackifiers (e.g., weed-free native grass, hay, small grain straw, wood straw, and/or live mulch), in coordination with the BLM AO.				•	•
Use snow fences, as needed in moisture-limited ecological sites, to trap additional moisture.					•

• - indicates that BMPs will be implemented during reclamation activities

5.0 SITE PREPARATION AND REVEGETATION

Disturbed areas on federal lands in the Rail Facility Site will be prepared and revegetated using BLM-approved measures and seed mixtures, as described below.

5.1 SITE PREPARATION

Soil conditioning, decompaction, and topsoil protection measures will be implemented to reestablish topsoil properties and to protect the seeding surface, as described in the CCSM Project Master Reclamation Plan (BLM 2012a) and in compliance with BLM Wyoming Reclamation Policy (BLM 2012b). Seedbed preparation maximizes seeding efficiency and improves reclamation success and includes topsoil replacement, discing, and surface roughening techniques. Preparation techniques will be closely monitored and evaluated based on revegetation success. Soil conditioning and amendments may be necessary to ameliorate poor topsoil and subsoil quality.

PCW will implement the following BMPs to redistribute topsoil and protect the seeding surface, as appropriate and necessary:

- Suspend construction activities when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting (Rail Facility Site-specific Plan of Development – Appendix A).
- To the extent practicable, do not mix topsoil and subsoil during site preparation.
- Perform primary tillage of the subsoil prior to the replacement of topsoil to improve drainage.
- Perform secondary tillage of topsoil to break up clods; secondary tillage will be no deeper than the depth of the replaced topsoil.
- Till across slope or perpendicular to the prevailing wind to reduce erosion.
- Prior to seeding, perform a final tillage to break up any remaining clods and produce a firm seed bed.
- Inspect the soil surface for ponding or gullying.
- After seeding, create furrows or pits to roughen the soil surface, increase moisture infiltration, capture blowing snow, and slow the surface velocity of wind and water to reduce erosion and sedimentation.
- If, during operation, it is determined that snow accumulation causes significant accelerated erosion, implement appropriate mitigation measures (e.g., snow fence construction) in accordance with the Winter Access Plan (Rail Facility Site-specific Plan of Development – Appendix E).

5.2 REVEGETATION

The primary objective of revegetation is to establish the species composition, diversity, structure, and total ground cover appropriate for the desired plant community (BLM 2012b). In accordance with BLM Wyoming Reclamation Policy (2012b), proper seed mixtures will be used to reclaim

disturbed areas on federal lands with native vegetation, as detailed in the CCSM Project Master Reclamation Plan (2012a), and further refined for each Ecological Site in Attachment B.

Initial seeding will be used to achieve temporary vegetation coverage or stabilization of soil stockpiles or until interim or final reclamation measures can be implemented. Longer term reclamation measures include seeding following the redistribution of soils to the original vertical profiles, compaction evaluations, mulching and amendment additions, and soil roughening.

5.2.1 Seed Mixture Design

Seed mixtures will be tailored to establish species diversity, composition, and ground cover that reflects the baseline conditions. Based on established criteria, the seed mixture selection process will consider commercial availability and cost, growth form, seasonal variety, and prevailing dominant and locally adapted species. Only approved, certified weed-free seeds will be used. PCW, in coordination with the BLM AO, will develop a specific seed mixture for each reclamation prescription on federal lands. To increase the likelihood of successful reclamation, locally adapted native plant materials based on the site characteristics and ecological setting (i.e., the pre-disturbance site characterization) will be selected when possible. Seed mixtures for private and state lands will be developed in coordination with private landowners and state agencies, as appropriate.

The seed mixture for each ecological site will contain the following elements:

- Species composition and diversity for the desired plant community, ecological setting, and current soil properties based on pre-disturbance vegetation characteristics.
- Native dominant herbaceous species that support or augment the post-disturbance land uses, including species-specific wildlife habitat, rangelands, and other uses.
- Full shrub and/or sub-shrub species when these species will help achieve reclamation objectives while supporting post-disturbance land uses and/or wildlife habitat needs.
- Native forb species or other plant species approved by the BLM, private landowner, or state agency, as appropriate.
- Seed banking and onsite seed collection will only be considered if native and locally adapted seed sources are not available.

5.2.2 Seeding Schedule

Seeding will be implemented during all phases of development depending on initial or long-term reclamation objectives. When possible, seeding will occur prior to anticipated precipitation events to increase the likelihood of germination and vegetation establishment. Seeding will be preferable prior to snowfall so that seeds are not blown away or eaten by birds. Seeding schedule and timing will be determined on a site-specific schedule and in coordination with the BLM AO and accordance to the WYDEQ permit requirements (WYDEQ 2007).

PCW will implement the following BMPs and protective measures related to seeding schedules, as necessary and appropriate (BLM 2008; WRRC 2010):

- Follow proper timing for the specific seed mix. Dormant seeding after October 15 before the ground freezes or before April 15 is anticipated to be most effective.
- Seed when soil temperatures are around 40 °F

5.2.3 Seeding Rates and Methods

Seeding rates will vary by application method, reclamation objective, desired plant community, and wildlife considerations. Typically, broadcast seeding may require significantly more seed than drill seeding to achieve similar results. Reclamation areas around specific wildlife habitats or environmentally sensitive areas may require higher seeding rates to establish vegetation more quickly for erosion control and reestablishment of forage base. Seeding rates and methods will be determined on a site-specific schedule and in coordination with the BLM AO.

PCW will implement the following BMPs and protective measures, as necessary and appropriate, to reestablish vegetation (BLM 2008; WRRC 2010):

- Calculate seeding rates using Natural Resources Conservation Service (NRCS) worksheets.
- Alter seeding rates as needed based on site slope, stability and soil quality (e.g., increasing the rate for critical areas where germination is inhibited by low soil quality).
- Base seeding rates on application method (e.g., increased rate for broadcast seeding).
- In coordination with the BLM AO, reduce seeding rates in areas where a viable seed bank remains in the topsoil.
- Calibrate seed drills or broadcast seeders regularly.
- Select appropriate equipment for the terrain, e.g. drill seeding is currently preferred on flat ground but broadcast seeding will be suitable for steeper slopes.
- Harrow or rake broadcast seed to increase germination.
- Where feasible, hydromulch on steep slopes after seeding.
- Establish proper seeding depths, e.g. 0.25 to 0.5 inch for many grasses and large seeded forbs and less than 0.125 inch for small seeded shrubs and forbs.
- Purchase certified seeds or seeds from a reputable seller.
- Follow proper seed handling guidelines, including storage temperature and humidity.
- Post signs or establish physical barriers where needed to limit public use of the reclaimed surfaces while the vegetation reestablishes.
- Use snow fences, as needed in moisture-limited ecological sites, to trap additional moisture.
- Exclude livestock from reclaimed areas, as practicable, until appropriate levels of site stabilization and revegetation are achieved.

6.0 WEED MANAGEMENT

PCW will control noxious, non-native, and invasive weeds at the Rail Facility Site in accordance with the Weed Management Plan (Rail Facility Site-specific Plan of Development – Appendix H). Weed management in the Rail Facility on federal lands is a cooperative effort between the surface landowner and BLM.

Within the Rail Facility Site, BLM has recorded occurrences of two noxious and invasive weed species, Russian knapweed (*Centaurea repens)* and perennial pepperweed (*Lepidium latifolium)*. Russian knapweed occurrences have been documented along the Union Pacific railroad corridor and perennial pepperweed has been documented throughout the Sugar Creek drainage (BLM 2012a).

Noxious and invasive weed species surveys were conducted within the limits of disturbance for the Rail Facility in 2013 (Rail Facility Site-specific Plan of Development – Appendix J). In addition to confirming the Russian knapweed and perennial pepperweed occurrences documented by the BLM, the weed surveys documented povertyweed (*Iva axillaris*) associated with a Black Greasewood/Inland Saltgrass Shrubland and halogeton (*Halogeton glomeratus*) and cheatgrass (*Bromus tectorum*) in the pipeline corridor south of the Rail Facility and other previously disturbed areas. PCW will implement the CCSM Project Weed Management Plan (BLM 2012a) to control weeds within the limits of disturbance of the Rail Facility.

As appropriate, PCW will implement the following BMPs and protective measures for the control of noxious and invasive plant species at the Rail Facility Site (BLM 2008; WRRC 2010):

- Only approved, certified weed-free seeds will be used.
- PCW will monitor the Rail Facility Site for noxious and invasive weed species regularly in accordance with the CCSM Project Weed Management Plan (BLM 2012a).
- PCW will control weeds in accordance with the CCSM Project Weed Management Plan (BLM 2012a).
- PCW will wash construction equipment in accordance with the CCSM Project Weed Management Plan (BLM 2012a).
- PCW will mark weed occurrences during construction in accordance with the CCSM Project Weed Management Plan (BLM 2012a).
- PCW will train employees on noxious and invasive plant species awareness and measures to prevent the spread of weeds in accordance with the Environmental Compliance Plan (Rail Facility Site-specific Plan of Development – Appendix F).

7.0 RECLAMATION MONITORING

The BLM Wyoming Reclamation Policy (2012b) requires that a reclamation monitoring and reporting plan be developed and implemented to conduct compliance and effectiveness monitoring. Reclamation monitoring is required to evaluate reclamation progress to determine reclamation success and if additional measures are required. Reclamation success will be evaluated based on the objectives specified in the CCSM Project Master Reclamation Plan.

Reclamation monitoring for the CCSM Project has four primary objectives: 1) to document the condition of reclaimed areas relative to the adjacent undisturbed reference sites; 2) to provide an expeditious means for monitoring all reclamation sites to document reclamation progress; 3) to standardize monitoring protocols across the CCSM Project and incorporate digital data-tracking and database development; and 4) to establish a monitoring plan for managing bond release.

Reclamation monitoring will occur annually in accordance with BLM requirements, as outlined in the Monitoring and Reporting Plan (Attachment A). Vegetation will be evaluated against the reclamation success standards contained in the CCSM Project Master Reclamation Plan and the reference sites established during pre-disturbance characterization. The current plant community condition class for each ecological site in the CCSM Project site is not representative of the Historic Climax Plant Community (HCPC) and occurs in an alternative state condition class. Reclamation success will be evaluated on the current plant community condition class as established by the appropriate reference site conditions and in coordination with the BLM AO. In addition, erosional assessments and photopoints will be completed to support reclamation monitoring efforts.

A data dictionary has been developed by the BLM RFO to track monitoring parameters (Attachment A). The application of GPS, GIS, and digital data-tracking during reclamation and monitoring activities allows for in-depth knowledge of disturbance site conditions and will facilitate more informed and targeted remediation actions. By incorporating standardized monitoring protocols and a universal data dictionary, as further described in the Monitoring and Reporting Plan (Attachment A), the information can be used to establish a field-wide, geo-referenced database with immediate access to disturbance acres, reclamation status, and monitoring history. In addition, this information provides the BLM with a reclamation history to evaluate reclamation success and expedite future reclamation activities.

The monitoring approach is designed to provide a standardized tool for evaluating reclamation status throughout the CCSM Project that can be used to make informed decisions on what actions are needed to obtain field-wide reclamation success. These decisions may range from a high-level action such as revising this Plan to a site-specific action such as installing a silt fence. The record will be essential to tracking reclamation progress and initiating appropriate remedial actions for the life of the CCSM Project.

PCW and BLM will evaluate whether reclamation is progressing towards success. If necessary, PCW will propose additional measures to facilitate reclamation success. In coordination with the BLM AO, PCW will implement these measures. Additional measures may include reseeding, soil stabilization and amendments, weed control, mulching, fertilizing, fencing, and irrigation. The reporting procedures for areas requiring additional reclamation management are provided in the Monitoring and Reporting Plan (Attachment A).

8.0 REFERENCES

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ATTACHMENT A

Reclamation Monitoring and Reporting Plan

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) has prepared this Reclamation Monitoring and Reporting Plan (Plan) for Phase I of the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project). This Plan is based on four primary objectives: 1) to document the condition of reclaimed areas relative to reference sites; 2) to provide an expeditious means for monitoring reclamation sites and documenting reclamation progress; 3) to standardize monitoring protocols across the CCSM Project incorporating digital data-tracking and database development; and 4) to establish a program for managing bond release.

Monitoring for Phase I of the CCSM Project will consist of ecological site delineation, pre-disturbance site characterization, and reclamation success monitoring. The monitoring procedures outlined in this Plan were developed in cooperation with BLM and adhere to the Wyoming Reclamation Policy (BLM 2012a), management directives presented in the Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), BLM RFO Reclamation Guidance (BLM 2011), and the CCSM Project Master Reclamation Plan (BLM 2012b), and further incorporate methodologies described in the *Interagency Ecological Site Handbook for Rangelands* (Caudle et al. 2013). The CCSM Project is a large development that will take place over a short time period. The methods and procedures described in this Plan are commensurate with the complexity of the CCSM Project.

This Plan is intended to be adaptive to take into account changing conditions and techniques. PCW, with concurrence from the BLM Authorized Officer (AO), may update, modify, or change the procedures contained in this Plan when warranted.

2.0 ECOLOGICAL SITE APPROACH

Reclamation planning for the CCSM Project is based upon ecological sites. An ecological site is a division of the landscape into distinctive kinds of land based on recurring soil, landform, geological, and climate characteristics that differ in their ability to produce distinctive types and amounts of vegetation and in their ability to respond similarly to management actions and natural disturbances (Caudle et al. 2013). Each ecological site is identified, differentiated, and described based on the relationship between abiotic and biotic environmental factors and how they influence plant community composition.

Ecological site descriptions (ESDs) provide a consistent framework for stratifying and describing rangelands and their soil, vegetation, and abiotic features, while providing delineated units that share similar potential to respond to management activities or disturbance processes (Caudle et al. 2013). Assessing ecological site characteristics and developing ecological site-specific reclamation techniques will increase the likelihood that revegetation is successful and that reclamation success standards are met.

To facilitate the development of ecological site descriptions and site-specific reclamation plans and procedures, PCW identified ecological sites across the precipitation zones (7-9 inch precipitation zone, 10-14 inch precipitation zone, and 15-19 inch precipitation zone)

associated with the development of Phase I of the CCSM Project. Ecological sites within these zones were identified as having unique physiographic and biophysical characteristics including elevation, moisture regime, soil conditions, and vegetation characteristics that are important considerations in the development of site-specific reclamation procedures, best management practices, and monitoring approaches. PCW used soil surveys along with vegetation data, aerial imagery, climate information, and other natural features to delineate each ecological site.

The development of reclamation plans and reclamation procedures based on ecological sites will provide a consistent and science-based approach to reclamation and facilitate the development of protocols necessary to meet the requirements of Wyoming BLM Reclamation Policy (BLM 2011; 2012a). Ecological sites have been identified for Phase I of the CCSM Project and Attachment B contains the site-specific data, descriptions, and best management practices for the ecological sites associated with each site-specific reclamation plan.

3.0 MONITORING

Reclamation monitoring for the CCSM Project consists of ecological site delineation, pre-disturbance site characterization, and reclamation success monitoring. The monitoring procedures outlined in this Plan adhere to the Wyoming Reclamation Policy (BLM 2012a), the CCSM Master Reclamation Plan (BLM 2012b), and incorporate methodologies described in the *Interagency Ecological Site Handbook for Rangelands* (Caudle et al. 2013).

3.1 ECOLOGICAL SITE DELINEATION

The objective of ecological site delineation is to confirm the attributes that differentiate, classify, and characterize the ecological sites for the CCSM Project and to provide a systematic framework to detect patterns of similar vegetation composition and relationships between vegetation, soil properties, and other environmental factors. During monitoring for ecological site delineation, potential reference sites were also identified for use during reclamation success monitoring (Section 3.3 – Reclamation Success Monitoring).

Monitoring to determine ecological site delineation was completed in 2013 and was used to refine the ecological sites modeled for Phase I of the CCSM Project Site. The baseline information collected includes topographic, hydrologic, vegetation, and soil parameters. Monitoring was conducted as described in Section 4.0– Monitoring Protocols. Monitoring locations for ecological site delineation monitoring are shown in Attachment B. The vegetation and soils data collected as part of the ecological site delineation and pre-disturbance site characterization were used to develop ecological site-specific reclamation implementation plans (Attachment B); these plans contain the site-specific detailed information necessary to conduct successful reclamation. Through the data collection process, PCW also identified ecological sites and other areas that may have limited reclamation potential (LRP).

3.2 PRE-DISTURBANCE SITE CHARACTERIZATION

Pre-disturbance site characterization is a critical component for reclamation monitoring to describe the surrounding landscape, determine ecological site types, and assess biophysical parameters during planning. The use of ecological sites allows for proper planning and timely implementation of activities, as well as baseline landscape, soil, and vegetation characteristics to be recreated with reclamation practices.

When practicable, vegetation and soil data collected for the sites during the ecological site delineation monitoring will be used for pre-disturbance site characterization; however, additional pre-disturbance site characterization may be necessary and any additional monitoring that is necessary will be conducted during the growing season prior to surface disturbing activities. Additional pre-disturbance site characterization locations will be determined in coordination with the BLM. The sampling methods described in Section 4.0 – Monitoring Protocols will be used for pre-disturbance site characterization.

3.3 RECLAMATION SUCCESS MONITORING

In accordance with the BLM Wyoming Reclamation Policy (BLM 2012a), reference sites will be identified and used for annual reclamation success monitoring. A minimum of three reference sites will be established for each ecological site to capture the expected variability within each site, inform annual monitoring, and define reclamation standards. Each site will be identified in coordination with BLM. Sites identified during ecological site delineation may be suitable for use as reference sites and will be used to the maximum extent possible. Reference sites will be characterized using the monitoring protocols described in Section 4.0 – Monitoring Protocols (Caudle et al. 2013). Each reference site will be protected from any future development or other anthropogenic disturbance to provide for long-term comparison of natural plant communities in the CCSM Project Site to reclaimed areas and to identify natural trends as they occur.

3.3.1 Reclamation Success Standards

Reclamation success standards will be used to assess whether reclamation requirements are being met. These success standards are outlined in the CCSM Project Master Reclamation Plan (BLM 2012b), and reiterated here, with additional clarification to facilitate monitoring and reporting. Success standards are organized by three major groups: Surface and Soils Stabilization, Landscape Reconstruction, and Revegetation:

A. Surface and Soils Stabilization Standards

    1. Undesirable materials (e.g., contaminated soils, potentially hazardous materials) will be isolated and/or removed to protect the reclaimed landscape from contamination.
    2. The land surface will be recontoured and other soil conservation, surface manipulation, and water management techniques will be implemented to establish stable slopes, watercourses, and drainage features to minimize

erosion and sedimentation (also protecting surface water and groundwater resources).

3. The soil surface must be stable and have adequate surface roughness to reduce run-off and capture rainfall and snow melt.
4. Short-term measures, such as the application of mulch or mechanical surface roughening may be used to limit surface soil movement.

B. Landscape Reconstruction Standards

1. The original landform will be restored or approximated for disturbed areas that are not required for regular operations and maintenance activities.
2. The reclaimed landscape will have characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features and will support existing and future land uses.
3. Erosional features will be less than or equal to the surrounding area.

C. Revegetation Standards

1. Qualitative Standards
   i. A self-sustaining and locally native plant community will be established on the site.
   ii. Vegetation will have a density sufficient to control erosion and non-native plant invasion and re-establish wildlife habitat and forage production.
   iii. Resilient vegetation will be established on the site. Plants must be resilient as evidenced by well-developed root systems and successful reproduction.
   iv. Shrub communities will be established on sites on federal lands (only in communities where shrubs were present prior to construction). Shrubs must be well established, at least in a "young" age class (not comprised mainly of seedlings that may not survive until the following year) showing evidence of reproduction.
2. Quantitative Standards
   i. Sufficient species diversity will be established. No single species will account for more than 30 percent of total vegetative composition on federal lands unless it is evident at higher levels in adjacent undisturbed reference sites.
   ii. Reclamation of permanent vegetative cover will be determined successful when the basal cover of desirable perennial species is at 80 percent of the reference sites for that ESD (Attachment B).
   iii. Invasive plants and state-listed noxious weed species are a minor component of the plant community on the site. Invasive plant species should account for less than 5 percent total plant cover and reclamation species should be outcompeting weed species within two years of reclamation initiation. BLM has zero tolerance for state-listed noxious

weed species and weed control may be necessary even after reclamation standards have been met.

3.3.2 Monitoring Data Collection Overview

Data compiled to support the annual reclamation monitoring report includes:

A. Spatial data (Exhibit III):
   1. Surface Disturbance;
   2. Ecological Site; and
   3. Weed Infestation
B. Field-based monitoring of percent cover using methods described in Section 4.1.1 – Vegetation Sampling Protocols.
C. Photopoints of reclamation areas as described in Section 4.1.1 – Vegetation Sampling Protocols.
D. Seeding contractor reports for all seeding activities.
E. Weed contractor reports for all weed control activities.

3.3.3 Field-Based Monitoring of Reclamation

Vegetation data will be collected as described in Section 4.1.1 – Vegetation Sampling Protocols. Data will be compared to success standards (Section 3.3.1 – Reclamation Success Standards) as defined by the selected reference sites for each ecological site and summarized in the annual reclamation monitoring report (Section 5.0 – Reporting). Basal cover (line-point intercept) will be used to evaluate vegetation standards and reclamation success. Shrub intercept and SamplePoint protocols will not be used to evaluate reclamation success, per BLM reclamation requirements (BLM 2012). Photopoints will be taken from permanently established locations for the start of each monitoring location as described in Section 4.1.1 – Vegetation Sampling Protocols.

4.0 MONITORING PROTOCOLS

Attribute data have been collected to characterize and delineate ecological sites (Attachment B) across the CCSM Project Site (Caudle et al. 2013). The following sampling protocols and methodologies were selected and modified as needed to identify, evaluate, and document landscape, vegetation, and soil characteristics within each ecological site. Data forms have been developed for tablet technology to support more efficient and standardized field data collection.

Ecological site monitoring is intended to be rapid and focused on sampling the environmental range associated with initial ecological site concepts (Caudle et al. 2013). Vegetation and soil measurement methods will include line-intercept for canopy cover; canopy gap intercept; line-point intercept for basal and foliar cover; species composition; and, an evaluation of soil chemical and physical properties. The following data are required to inform the ecological site concept and confirm the ecological site model (Caudle et al. 2013):

- Representative species list

- Canopy or foliar cover, by species, growth form, and vertical strata
- Vegetation vertical and horizontal structure
- Inherent and dynamic soil properties
    - Physical Properties
        - Soil profile horizons and topsoil depth
        - Color
        - Structure and consistence
        - Texture
        - Texture modifiers
    - Chemical Properties
        - Electrical conductivity
        - Carbonate Equivalent (percent)
        - Soil reaction (pH)
- Topography (i.e., landform, slope, aspect, elevation, slope shape)
- Ground cover (unprotected soil, basal vegetation cover, litter, gravel, rock, biological soil crust – includes mosses, lichens and cyanobacteria)
- Photographs that capture landscape setting as well as dominant vegetation components

Sampling methods have been developed in coordination with the BLM. The protocols sufficiently characterize soil diagnostic horizons and their properties (e.g., soil texture, soil texture modifiers, soil depth to a restrictive horizon), landform, topographic features (slope and aspect), complete species lists, variations in plant species cover and structure, and soil surface properties.

Monitoring and reference sites will be selected prior to surface disturbing activities. Reference locations will be selected from the pre-site characterization survey locations that were sampled during ESD-characterization efforts and described above. It is anticipated that a minimum of one and not more than three reference sites will be established per ecological site.

Reclamation evaluation areas (REAs) will be used to evaluate reclamation success for linear features, areas of contiguous disturbance, and groups of turbines. One reclamation monitoring location will be established within each REA to measure reclamation success for a disturbed feature(s). All monitoring locations will be evaluated in the field prior to data collection and will be micro-sited to serve as representative monitoring locations with consistent environmental settings (i.e., elevation, slope, aspect, landform, etc.). REAs for each project disturbance type are described below:

- Linear Features - Linear features will be split into segments of 1 mile in length. If the entire 1 mile length of a segment falls within a single ecological site, that segment will become the REA in which reclamation success will be measured. If the segment crosses multiple ecological sites, the segment will be subdivided into smaller REAs for each ecological site.

- Contiguous disturbances - Blocks of contiguous disturbance (operations centers, laydown yards, etc.) will be split into 10-acre plots of a contiguous ESD representing the REA. If a 10-acre plot cannot be formed within an ESD, a smaller REA will be established.
- Turbines - Turbines in each turbine string will be characterized according to the ecological site in which they are located. Turbines falling within the same ecological site will be subdivided into groups of ten or fewer turbines which will represent the REA that will be used to measure reclamation success.

For all REAs, monitoring locations are subject to change based on abiotic and biotic conditions (i.e., fire, drought, etc.) that might change after reclamation monitoring begins.

4.1.1 Vegetation Sampling Protocols

Vegetation data will include a qualitative and quantitative inventory of plant species, canopy and basal vegetation cover estimates, ground cover estimates, dominant plant species, and canopy and basal gap intercepts. Opportunistic observations of rare plant species and noxious and invasive weed species will also be documented and recorded.

A vegetation sampling transect (100 meter) will be established in each REA and for each reference site to quantitatively assess vegetation composition and structure (Exhibit I). Location and direction of each transect will be randomly assigned to effectively assess vegetation characteristics within each ecological site. Percent cover along each sampling transect will be evaluated using line-point intercept (LPI) methods (Herrick et al. 2009). Top canopy, sub-canopy, basal layers, and ground cover will be recorded at 1-meter intervals (Herrick et al. 2009). LPI is the preferred method for percent cover because it is more repeatable and more efficient than quadrat (e.g., Daubenmire and grid-point) techniques (Marlow and Clary 1996; Wirth and Pyke 2007; Gordínez-Alvarez et al. 2009). Continuous line intercept (shrub intercept) will be used to estimate shrub canopy cover within the site (Herrick et al. 2009).

A qualitative assessment will be conducted to capture all species, when practicable, that are present within the vicinity of the transect. This will be accomplished by walking the transect and recording occurrences of each species observed within 2.5 meters of the transect line. A species list will be tabulated for each monitoring location.

Photopoints will be taken from the permanently established locations for the start of each transect. The location will be marked with a permanent stake and UTM coordinates of the location will be recorded. Six photographs will be taken from each location following modified procedures described by Herrick et al. (2009). A representative transect photo will be captured at the beginning (0 meter) of each vegetation transect. Additional landscape photos will be established for each of the four cardinal directions (North – 0°; East – 90°; South – 180°; and, West – 270°). A nadir photograph will be taken of the ground cover from a height of approximately 1.5 m at 10 meters along the vegetation transect. Along with photopoints documenting the surrounding conditions of the ecological site, 20 nadir

photographs will be taken at 5 m intervals along the 100-meter transect of representative reference sites.

Photopoints will also be established at each turbine location (photos taken in each of the cardinal directions and nadir) to allow for an ocular comparison of reclamation success versus that measured at the monitoring location for the REA.

4.1.2 Soil Sampling Protocols

Erosion potential will be qualitatively assessed for each REA by evaluating soil erosion standards described in Pellant et al. 2005. A site evaluation for each erosional feature (pedestals, flow patterns, rills, and gullies) will be conducted to estimate overall risk of erosion for each monitoring location and for the ecological site overall. Where erosion potential is identified as being severe or critical, measures to decrease erosion potential will be identified in coordination with BLM through the adaptive management process. .

Soil testing has been completed as part of pre-site characterization efforts including sampling at potential reference sites. Soil physical and chemical characteristics have been characterized for each ecological site using testing kits developed by the Wyoming Reclamation & Restoration Center [WRRC] with adapted protocols from the *Field Book for Describing and Sampling Soils* (Schoeneberger et al. 2012).

It is anticipated that the pre-site characterization efforts and soil handling methods identified for each ecological site will limit the need for post-construction soil sampling unless reclamation efforts are not successful. If reclamation success is limited by post-construction soil conditions, appropriate testing methods and locations will be determined in coordination with BLM through the adaptive management process.

5.0 REPORTING

Reclamation monitoring and reporting will occur annually in accordance with BLM requirements. Vegetation will be evaluated against the reclamation success standards described in Section 3.3.1 – Reclamation Success Standards and the reference sites established during pre-disturbance planning. In addition, erosional assessments and photopoints will be completed to support reclamation monitoring efforts.

PCW will submit annual reclamation monitoring reports and digital and geo-referenced reclamation data to BLM by February 1 of each year and BLM will complete an evaluation of annual monitoring reports and provide recommendations by March 31 of each year. This will enable PCW to adaptively manage reclamation, if necessary, prior to the next field and reclamation season.

5.1 REPORT REQUIREMENTS

PCW will be responsible for the following:

A. Monitoring of reference sites and reclamation areas;

B. Determining if reclamation success standards are being met;

C. Developing and implementing remedial actions if success standards are not being met;

D. Reporting monitoring results to BLM annually (February 1);

E. Providing digital copies of monitoring data:

   1. Required spatial data in digital format, including tabular data as described in Exhibit III.

   2. Vegetation monitoring data (line-point intercept) in digital format

F. Requesting concurrence from BLM that success standards have been met and monitoring is no longer required; and

G. Monitoring for noxious weeds

H. Spatial data for all reclaimed and disturbed areas.

The BLM will be responsible for the following:

A. Evaluating annual monitoring reports;

B. Providing a determination as to whether or not reclamation assessments are accurate and success standards are being met, including the rationale for the determination; and

C. Providing input on remedial actions to facilitate reclamation success (which may include requiring certain actions such as soil testing, soil amendments, irrigation, etc. that are not required by this plan).

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Exhibit I

Vegetation Sampling Protocols
(Herrick et al. 2009)

Line-point Intercept Method (Herrick et al. 2009)

Line-point intercept (LPI) is a rapid, accurate method for quantifying soil cover, including vegetation, litter, rocks and biotic crusts. These measurements are related to wind and water erosion, water infiltration and the ability of the site to resist and recover from disturbance. For a detailed discussion of this and other methods for measuring plant cover and/or composition, see Elzinga et al. 2002.

Materials

- Measuring tape (length of transect)—100 meters
- Two steel pins for anchoring tape
- One pointer—a straight piece of wire or rod, such as a long pin flag, at least 75 cm (2.5 ft) long and less than 3 mm (0.12 in) in diameter
- Panasonic Toughpad with LPI Digital Data Form

Standard methods (rule set)

1. Pull out the tape and anchor each end with a steel pin.

   Rules

   1.1 Line should be taut along surface layer.

   1.2 Line should be as close to the ground as possible.

2. Begin at the "0" end of the line.
3. Working from left to right, move to the first point on the line (1-meter increments). Always stand on the same side of the line.
4. Drop a pin flag to the ground from a standard height (__ cm) next to the tape.

   Rules

   4.1 The pin should be vertical.

   4.2 The pin should be dropped from the same height each time. A low drop height minimizes "bounces" off of vegetation but increases the possibility for bias.

   4.3 Do not guide the pin all the way to the ground. It is more important for the pin to fall freely to the ground than to fall precisely on the mark.

5. Once the pin flag is flush with the ground, record every plant species it intercepts.

   Rules

   5.1 Record the species of the first stem, leaf or plant base intercepted in the "top canopy" column using the PLANTS database species code (http://plants.usda.gov/), a four-letter code based on the first two letters of the genus and species, or the common name.

   5.2 If no leaf, stem or plant base is intercepted, record "NONE" in the "Top canopy" column.

5.3 Record all additional species intercepted by the pin.

5.4 Record herbaceous litter as "L," if present. Litter is defined as detached dead stems and leaves that are part of a layer that comes in contact with the ground. Record "W" for detached woody litter that is greater than 5 mm (or ~1/4 in) in diameter and in direct contact with soil.

5.5 Record each canopy species only once, even if it is intercepted several times.

5.6 If you can identify the genus, but not the species either use the PLANTS database genus code (http://plants.usda.gov) or record a number for each new species of that genus. ALWAYS define the genus portion of the code and the functional group at the bottom of the data form (*Artemisia* species = AR01).

5.7 If you *cannot* identify the genus, use the following codes:

AF# = Annual forb (also includes biennials)

PF# = Perennial forb

AG# = Annual graminoid

PG# = Perennial graminoid

SH# = Shrub

TR# = Tree

If necessary, collect a sample of the unknown off the transect for later identification.

5.8 Canopy can be live or dead, but only record each species once. Be sure to record all species intercepted.

6. Record whether the pin flag intercepts a plant base or one of the following in the "Soil surface" column.

R = Rock (> 5 mm or ~1/4 inch in diameter)

BR = Bedrock

L = Herbaceous litter

W = Wood

BSC = Biological soil crust (includes cyanobacteria, lichens, and moss)

S = Unprotected soil

Rules

6.1 For unidentified plant bases, use the codes listed under 5.7.

Continuous Line Intercept (Shrub Intercept) Method (Herrick et al. 2009)

Continuous line intercept measurements provide information about the proportion of the line covered by vegetation and large gaps between plants. Large gaps between plant canopies are important indicators of potential wind and water erosion and weed invasion. Continuous line intercept (shrub intercept) will be used to estimate shrub canopy cover along the transect. This protocol qualifies the shrub diversity and quantifies the amount of live and dead shrub canopy (parsed by species) that intersects the transect. For a detailed discussion of this and other methods for measuring plant cover and/or composition, see Elzinga et al. 2002.

Standard methods (rule set)

1. Pull out the tape and anchor each end with a steel pin.

   Rules

   1.1 Line should be taut along surface layer.

   1.2 Line should be as close to the ground as possible.

2. Begin at the "0" end of the line.

3. Working from left to right, move to the first point on the line (1-meter increments). Always stand on the same side of the line.

   Rules

   3.1 Look straight down on the tape. Use a meter stick or other stiff stick to project a line vertically to the ground.

   3.2 Assume that there is a wall at each end of the tape. Do not consider gaps or vegetation that occur off the end of the tape.

4. Canopy intercept. Record the beginning and end of each shrub canopy by species or sub-species.

   Rules

   4.1 Identify shrub species to species or subspecies.

   4.2 Canopy occurs any time the tape edge intercepts live or dead shrub foliar or branch cover based on a vertical projection from canopy to round.

   4.3 A plant canopy can be live or dead.

   4.4 Record the start and end of a gap to the nearest centimeter (0.1 ft)

   4.5 Exclude gaps in the shrub canopy greater than 10 cm (2 inches)

Surface Cover Documentation

Nadir photographs will be taken at 5-meter intervals along the 100 meter transect of vegetation sampling sites to estimate soil surface cover and vegetative cover and evaluate reclamation success.

Standard methods (rule set)

1. Pull out the tape and anchor each end with a steel pin.

   Rules

   1.1 Line should be taut along surface layer.

   1.2 Line should be as close to the ground as possible

2. Begin at the "0" end of the line.

3. Working from left to right, move to the first point on the line (5-meter intervals).

   Rules

   3.1 Always work on the same side of the line.

4. Establish 0.8 m scale/grid for nadir photograph by placing one pin flag perpendicular to the tape at the meter point and another pin flag perpendicular to the tape at 0.8 m from the meter point.

5. Capture nadir photograph to include tape measure and the two scalar pin flags (to ensure correct resolution and scale).

   Rules

   5.1 Use a digital camera set at minimum of 8 megapixel resolution.

   5.2 Avoid observer shadow and minimize poor light conditions by shooting toward sun.

Exhibit II

Soil Sampling Protocols
(Wyoming Reclamation & Restoration Center)
(Schoeneberger et al. 2012)

Soil Sampling Protocol

A modified pedon description data sheet will be used to collect site descriptions, soil physical properties, and soil chemical properties needed to assess ecological site characteristics (Schoeneberger et al. 2012). Site descriptions will provide the physiographic setting of the monitoring location, including climate features, geomorphic descriptions, and surface morphometry. Soil physical properties will provide horizon characteristics for each soil pit, including depth, boundary descriptions, matrix color, texture, and structure and consistence. Soil chemical properties will evaluate chemical characteristics that influence aboveground vegetative composition and erosion potential, and include saline class (electrical conductivity), effervescence (carbonate equivalency), and soil reaction (pH).

Materials

- Bi-metal dial thermometer
- Black permanent marker
- Conductivity calibration solution
- Distilled water
- Electrical conductivity meter
- *Field Book for Describing and Sampling Soils* (Schoeneberger et al. 2012)
- Garden trowel
- Hydrochloric acid (0.10 N)
- Level
- Magnetic nails
- Magnifying glass
- Measuring/mixing cup
- Measuring tape
- Measuring tube
- Munsell soil color charts
- pH 4.0 buffer solution
- pH 10.0 buffer solution
- pH meter
- Plastic cups
- Plastic bags (quart)
- Plastic spoon
- Red eye markers
- Safety goggles
- Soil sieve

Pit Construction

A wall/floor, small pit (SP) will be excavated to examine soil horizons, roots, geological substrata, etc. Soil pits will be constructed to a depth of approximately 50 cm (20 inches) or to the first layer of consolidated bedrock. Each pit will be oriented such that the largest pit face is facing the sun and well lighted. Topsoil and subsoil will be removed sequentially and separated so that it can be returned in opposite order to maintain the physical, chemical, and biological integrity of the soil and to approximate the visual state equivalent to its original undisturbed state, when practicable. A photograph will be taken of the soil pit and pedon, including scale and horizon indicators.

Site Description

Recording Date

Record the observation date (MM/DD/YYYY).

Location

Record precisely the point or site location coordinates (latitude, longitude) and geodetic datum.

Observer

Record the observer(s) making the description.

Site ID

Assign a site identification number as determined by ecological site and soil pit number.

Photopoint

Photograph the soil pit and pedon, including scale and horizon indicators, of the largest pit face that is facing the sun and well lighted.

Weather and Temperature

Weather

Document the prevailing weather conditions at time of observation (a site condition that affects some field methods). Weather conditions should be recorded as the following classes:

Class	Description
0	Clear or few clouds
1	Partly cloudy (scattered) or variable sky
2	Cloudy (broken) or overcast
3	Fog or smoke
4	Drizzle
5	Showers
6	Flurries
7	Snow showers

Air Temperature

Record the ambient air temperature at chest height (Celsius or Fahrenheit).

Soil Temperature

Record the ambient soil temperature and depth at which the soil temperature was determined. Soil temperature should only be determined from a freshly excavated surface that reflects the ambient soil conditions. When soil pit is first opened, soil temperature should be determined immediately. Temperature measurements will be taken at the bottom of the pit at 50 cm. In shallow pits, this may be modified, but temperatures should always be taken at least at the maximum depth of any given pit. In a newly opened pit, temperatures will be taken by inserting the temperature probe into the wall of the pit a minimum of 5 cm. The temperature is recorded when stabilized (about three minutes).

Geomorphic Description

Landscape

A landscape feature is a broad assemblage or unique group of natural, spatially associated features. Record the representative landscape feature associated with the described soil as defined in Schoeneberger et al. 2012.

Landform

A landform is a discrete, natural, individual earth-surface feature that is mappable at common survey scales. Record the representative landform feature associated with the described soil as defined in Schoeneberger et al. 2012.

Microfeatures

A microfeature is a discrete, natural earth-surface feature too small to delineate at common survey scales. Record the representative microfeature associated with the described soil as defined in Schoeneberger et al. 2012.

Geomorphic Component

Geomorphic components are three-dimensional descriptors of parts of landforms or microfeatures that are best applied to areas. Unique descriptors are available for *Hills*, *Terraces and Stepped Landforms*, *Mountains*, and *Flat Plains* (Schoeneberger et al. 2012). Record the representative geomorphic component associated with the described soil as defined in Schoeneberger et al. 2012.

Drainage Pattern

Drainage patterns describe the arrangement of drainage features and channels on the land surface. Record the representative drainage network associated with the described soil as defined in Schoeneberger et al. 2012.

Anthropogenic Features

An anthropogenic feature is a discrete, artificial (human-made) earth surface feature. Record any anthropogenic feature associated with the described soil as defined in Schoeneberger et al. 2012.

Surface Morphometry

Slope Aspect

Record the compass bearing (in degrees, corrected for declination) that a slope faces, viewed downslope.

Slope Gradient

Record the angle of the ground surface (in percent) through the ecological site and in the direction that overland water would flow (commonly referred to as slope).

Slope Complexity

Describe the relative uniformity or irregularity of the ground surface leading downslope through the point of interest. Smooth, linear or curvilinear slopes are simple (*S*) and irregular slopes with multiple changes in angle are complex (*C*).

Slope Shape

Slope shape is described in two directions: 1) vertical – up and down slopes, perpendicular or normal to the contour; and 2) horizontal – across slope, along the horizontal contour. These two descriptors are commonly reported as a pair. The first term refers to vertical slope and the second term refers to across slope. Record the vertical and horizontal slope shape for the described soil as defined in Schoeneberger et al. 2012.

Vertical Slope (Down)	Horizontal Slope (Across)	Code
Concave	Concave	CC
Concave	Convex	CV
Concave	Linear	CL
Convex	Concave	VC
Convex	Convex	VV
Convex	Linear	VL
Linear	Concave	LC
Linear	Convex	LV
Linear	Linear	LL

Hillslope Profile Position

Describe the two-dimensional hillslope position along the soil pit.

Position	Code
Summit	SU
Shoulder	SH
Backslope	BS
Footslope	FS
Toeslope	TS

Microrelief

Microrelief is a small, relative difference in elevation between adjacent areas on earth's surface. Record any microrelief associated with the soil surface as defined in Schoeneberger et al. 2012.

Profile Description

Horizon

Horizons are considered to be layers of pedogenically derived or modified material. Layers are deemed to be zones of nonpedogenically derived/modified material (e.g., geologic strata). These strata are differentiated by the weathering on geologic strata in developing soil horizons and are influenced by climate, relief, biological activity, parent material, and time. The physical and chemical properties (see below) will be described for each pedogenically distinguishable soil horizon to 50 cm depth or to the first restrictive geologic layer (Schoeneberger et al. 2012).

Depth

Soil depth will be sub-divided into horizons. Often the upper most horizon is made up of un-decomposed organic matter. Record the depths of both the upper and lower boundary for each horizon (in cm). Begin at the ground surface, which is not necessarily the mineral surface.

Boundary

Record the **Distinctness** and **Topography** of horizon boundaries. Distinctness is the vertical distance through which the bottom of one horizon grades (transitions) into another. Topography is the lateral undulation and continuity of the boundary between horizons.

Matrix Color

Record the soil matrix color according to Munsell notation (Hue, Value, Chroma) (Munsell Color 2010). Soil organic matter can be estimated using Munsell Color charts. Soil color will be recorded for dry and moist soil conditions.

Texture and Structure

Texture

Soil texture is the numerical proportion (weight percentage) of the sand, silt, and clay separates in the fine-earth fraction of the soil (less than 2mm). Coarse fragments can be very important to physical, chemical and biological soil properties, but generally the fine fraction of the soil has the most impact on soil properties. Soil texture will be field determined by hand texturing. Record the texture class and subclass as defined in Schoeneberger et al. 2012 and the Soil Texture Triangle. If necessary, use a Texture Class Modifier (see below)

Texture Class or Subclass	Code
Coarse Sand	COS
Sand	S
Fine Sand	FS
Very Fine Sand	VFS
Loamy Coarse Sand	LCOS
Loamy Sand	LS
Loamy Fine Sand	LFS
Loamy Very Fine Sand	LVFS
Coarse Sandy Loam	COSL
Sandy Loam	SL
Fine Sandy Loam	FSL
Very Fine Sandy Loam	VFSL

Texture Class or Subclass	Code
Loam	L
Silt Loam	SIL
Silt	SIL
Sandy Clay Loam	SCL
Clay Loam	CL
Silty Clay Loam	SICL
Sandy Clay	SCL
Silty Clay	SIC
Clay	C

Rock Fragments

Record any rock fragment texture modifiers that describe the percent volume range for rock fragments and relative size of modifiers. The "Quantity" modifier is the volume percent whole soil of the total rock fragment content. The "Size" modifier is independently based on the largest, dominant fragment size. For a size mixture, a smaller size class is named if its quantity (%) sufficiently exceeds that of a larger size class. For field texture determination, a small rock fragment size class must exceed either 1.5 or 2 times the quantity (volume 5) of a larger size class before it is named.

Rock Fragments Quantity and Size	Code	Criteria
Rock Fragments (> 2mm; ≥ Strongly Cemented)		
Gravelly	GR	≥ 15% but < 35% gravel
Fine Gravelly	GRF	≥ 15% but < 35% fine gravel
Medium Gravelly	GRM	≥ 15% but < 35% med. gravel
Coarse Gravelly	GRC	≥ 15% but < 35% coarse gravel
Very Gravelly	GRV	≥ 35% but < 60% gravel
Extremely Gravelly	GRX	≥ 60% but < 90% gravel
Cobbly	CB	≥ 15% but < 35% cobbles
Very Cobbly	CBV	≥ 35% but < 60% cobbles
Extremely Cobbly	CBX	≥ 60% but < 90% cobbles

Rock Fragments Quantity and Size	Code	Criteria
Rock Fragments (> 2mm; ≥ Strongly Cemented)		
Stony	ST	≥ 15% but < 35% stones
Very Stony	STV	≥ 35% but < 60% stones
Extremely Stony	STX	≥ 60% but < 90% stones
Bouldery	BY	≥ 15% but < 35% boulders
Extremely Bouldery	BYX	≥ 35% but < 60% boulders
Channery	CN	≥ 15% but < 35% channers
Very Channery	CNV	≥ 35% but < 60% channers
Extremely Channery	CNX	≥ 60% but < 90% channers
Flaggy	FL	≥ 15% but < 35% flagstones
Very Flaggy	FLV	≥ 35% but < 60% flagstones
Extremely Flaggy	FLX	≥ 60% but < 90% flagstones

Structure

Soil structure is the naturally occurring arrangement of soil particles into aggregates that results from pedogenic processes. Peds are aggregates of soil particles that are usually easily distinguished from other such aggregates. Often in soils, boundaries sometimes appearing as cracks separate one ped from another. Where boundaries are indistinct visually, surface of separation may be more obvious as soil is chipped away mechanically or broken physically. Peds may be very small to massive. Peds may be blocky, prismatic, columnar, platy, or crumb-like, and may have angular and sub-angular point on the peds. Record the Grade, Size, and Type as defined by Schoeneberger et al. 2012. Record the dominant type of ped, by layer. If a prevailing large shape readily breaks into smaller units, record as "(larger type) parting to (smaller type)".

Consistence

Consistence is the degree and kind of cohesion and adhesion that soil exhibits and or the resistance of soil to deformation or rupture under an applied stress. Soil-water state strongly influences consistence. Stickiness of the soil, when wet will be noted as well as rupture resistance. Record soil consistence when defining soil texture as defined in Schoeneberger et al. 2012.

Chemical Properties

Chemical response is the reaction of a soil sample to an applied chemical solution or a measured chemical value. Responses are used to identify the presence or absence of certain materials, to obtain a rough assessment of the amount present, to measure the intensity of a chemical parameter (e.g., pH), or to identify the presence of chemical species in the soil.

Saline Class (Electrical Conductivity)

Soil salinity class can be based on electrical conductivity (EC) measurements from a saturated paste extract. Gypsum ($CaSO_4 \cdot 2H_2O$) and salts more soluble than gypsum (e.g., Na, Mg, and Ca chlorides and sulfates) are the sole or major contributors to the saturated paste extract EC. Electrical conductivity may be measured at various soil solution extract ratios. The resultant EC values are not directly comparable because of the dilution effect. The salinity standard is the saturated paste extract.

Measurement of EC is done by taking a weight of soil and adding twice as much deionized water (1:2 – soil to water = $EC_{1:2}$), mixing and then waiting five minutes before taking an EC measurement (using a handheld portable EC meter and probe).

Salinity Class	Code	Saturated Paste $EC_{1:2}$ (dS/m)
Non-saline	0	< 0.4
Very Slightly Saline	1	0.4 to < 0.8
Slightly Saline	2	0.8 to < 1.6
Moderately Saline	3	1.6 to < 2.4
Strongly Saline	4	2.4 to < 3.2
Very Strongly Saline	5	≥ 3.2

Effervescence (Carbonate Equivalency)

Carbonates are present sometimes in soils of neutral to high pH. Their presence is often related to the parent material of the soil. Limestone and many types of sandstone contain carbonates and on weathering impart these to the resulting soil. Lime content of soil can be generally determined by adding a few drops of dilute hydrochloric acid (0.10 N HCl) to a few grams of soil. Bubbles emanating from the soils (effervescence) indicate the presence of carbonates. The amount of effervescence is directly related to the amount of carbonate present. The rate of effervescence is related to the kind of carbonate present. Sodium carbonates (Na_2CO_3, $NaHCO_3$) effervesce rapidly whereas carbonates associated with divalent metals (e.g., $CaCO_3$, $MgCO_3$) effervesce more slowly. Record effervescence of soils as defined in Schoeneberger et al. 2012.

Soil Reaction (pH)

Soil reaction (pH) is the measure of the hydrogen ion (H^+) activity of the soil. Hydrogen ion activity can be viewed as approximately equal to the hydrogen ion concentration, and when hydrogen ions are dilute, concentration and activity are for all practical purposes, equal. Measurement of pH is done by taking a weight of soil and adding twice as much deionized water (1:2 – soil to water = $pH_{1:2}$), mixing and then waiting five minutes before taking a pH measurement (using a handheld portable pH meter and probe). In cases where there is some suspicion that there is considerable sodium in the soil, the ratio of soil to water should be raised to 1:5. The pH meter should be standardized daily.

Descriptive Term	Code	Criteria: pH range
Ultra Acid	0	< 3.5
Extremely Acid	1	3.5 to 4.4
Very Strongly Acid	2	4.4 to 5.0
Strongly Acid	3	5.1 to 5.5
Moderately Acid	4	5.6 to 6.0
Slightly Acid	5	6.1 to 6.5
Neutral	6	6.6 to 7.3
Slightly Alkaline	7	7.4 to 7.8
Moderately Alkaline	8	7.9 to 8.4
Strongly Alkaline	9	8.5 to 9.0
Very Strongly Alkaline	10	> 9.0

Exhibit III

BLM Rawlins Field Office
Geospatial Guidance
(BLM 2011)

Method for collecting data for baseline data of disturbance

- GPS units will be used to collect data along the perimeter of each disturbance.
- GPS data will be collected as individual polygons using GPS units along the edge of each disturbance based on attributes discussed below.
- GPS units must have a rated accuracy of 4 meters or better (95% confidence interval).
- GPS data will be converted into the format of a shapefile and data will be referenced to NAD 1983 (CORS 96), UTM Zone 13N, meters.
- Attributes may be collected during field collection using a data dictionary on the GPS units or incorporated into the shape file during post processing.
- Rawlins Field Office (RFO) will provide any standardized data dictionaries that are requested.

GIS Shapefile Requirements

- Shapefiles will include all surface-disturbance.
- Shapefiles will be submitted at a minimum with the annual reclamation monitoring report on February 1 of each year for the previous year's work.
- Data will be submitted as polygons, not as point or line files.
- A minimum of three shapefiles will be submitted with annual reports:
    - Type 1 "Surface Disturbance" that includes all "as-built disturbance", interim/final reclamation, and long term disturbance data (annual submittals are dependent upon surface disturbance and reclamation occurring during each monitoring year).
    - Type 2 "Ecological Sites" that include polygons for ecological site information mapped to the as-built (this only needs to be submitted during the first annual report).
    - Type 3 "Weed Infestations" that include polygons for weed infestation associated with disturbance
- Polygons are required to have attributes (see details below)
- Submit your shapefiles to the BLM RFO, Attention: Reclamation Specialist
- Include a metadata file

Polygon Boundaries

- Shapefile Type 1 "Surface Disturbance" polygons will be defined by the following:
    1. As-built construction
    2. Un-reclaimed (interim and long term) disturbance
    3. Reclamation (interim and long term)

- Shapefile Type 2 "Ecological Site" (intended for reclamation and seed mix selection) will be defined by the following:
    1. Delineation of Ecological Sites
    2. Ready for Assessment by the BLM for rollover
- Shapefile Type 3 "Weed Infestation" polygons will be defined by the following:
    1. Weed Infestation patch (plants within 120 feet of each other)
    2. Distinct polygon for each weed species

Attribute Requirements

Shapefile 1 "Surface Disturbance" will contain the following attributes and be formatted as shown in the table:

True Name	**Site Number**	**ROW Number**	**API Number**	**Project Name**	**Project Number**	**Project Feature**	**Date of Disturbance**	**Disturbance**	**Acres**
Shapefile Alias	Site_Num	WYW_Num	API_Num	Projec_Nam	Proj_Num	Proj_Feat	Date	Dist_Type	Acres
Format	Text	Text	Text	Text	Text	Text	99/99/9999	Text	Integer
Width	20	20	20	50	20	50	99/99/9999	20	20

Shapefile 2 "Ecological Site" will contain the following attributes and be formatted as shown in the table:

True Name	**Site Number**	**ROW Number**	**API Number**	**Project Name**	**Project Number**	**Project Feature**	**Ecological Site**	**Date of Disturbance**	**Disturbance**	**Acres**	**Ready for Assessment**
Shapefile Alias	Site_Num	WYW_Num	API_Num	Projec_Nam	Proj_Num	Proj_Feat	ESD	Date	Dist_Type	Acres	Rollover
Format	Text	Text	Text	Text	Text	Text	Text	99/99/9999	Text	Integer	Text
Width	20	20	20	50	20	50	50	99/99/9999	20	20	10

Shapefile 3 "Weed Infestations" will contain the following attributes and be formatted as shown in the table:

True Name	**Site Number**	**ROW Number**	**API Number**	**Project Feature**	**Weed Species**	**Patch Density**	**Treated**	**Treatment Type**	**Treatment Date**	**Acres**
Shapefile Alias	Site_Num	WYW_Num	API_Num	Proj_Feat	Weed_Spec	Patch_Den	Treated	Treat_Type	Treat_Date	Acres
Format	Text	Text	Text	Text	Text	Text	Text	Text	99/99/9999	Integer
Width	20	20	20	50	50	20	10	50	99/99/9999	20

ATTACHMENT B

Ecological Site Implementation Plans

West Sinclair Rail Facility

Introduction

These ecological site reclamation implementation plans describe the site-specific conditions and reclamation practices that will be applied in the four ecological sites that fall within West Sinclair Rail Facility (Exhibits I-IV). The ecological sites are consistent with the Cool Central Desertic Basins and Plateaus (MLRA – 34A) (Natural Resources Conservation Service [NRCS] 2014) and are primarily located in the Wyoming Basin Province of the Rocky Mountain System in areas that receive approximately 7-9 inches of precipitation annually (NRCS 2011).

Cool Central Desertic Basins, Mountains, and Plateaus MRLA

The Cool Central Desertic Basins, Mountains, and Plateaus MRLA (MLRA – 34A) includes approximately 33,005 square miles (85,525 square km), with the majority in Wyoming (85%), and the remaining land in Colorado (13%) and Utah (2%) (NRCS 2014). 85% of the area is in the Wyoming Basin Province of the Rocky Mountain System and is bounded on the north by the Owl Creek Mountains, the Big Horn Mountains and the Wind River Range; to the west by the Salt Range and Wasatch Mountains; and to the east by the Laramie and Sierra Madre Mountains. Elevation ranges from 5,200 ft (1,585 meters) to 7,500 ft (2,285 meters). The Popo Agie, Sweetwater, Laramie, Green, and North Platte Rivers run through the northern part of this MLRA, and the Little Snake, Yampa, and White Rivers run through the southern section (NRCS 2014).

The average annual precipitation throughout the MLRA is 7 to 12 inches (18 to 30 cm) ranging to 32 inches (81cm) and the MLRA is divided into the 7-9 inch and 10-14 inch precipitation zones. Peak precipitation occurs as snow from October through April and as rain from May to September. Annual temperatures range from 33 to 47 °F; the frost free period averages 105 days. Water is scarce throughout the MLRA but the surface water quality is good. Ground water supplies are meager and little developed.

Much of the MLRA is covered by residual basin-floor materials and materials washed in from the surrounding mountains and plateaus, with shale and sandstone being the dominant rock types. The dominant soil orders in this MLRA are Aridisols and Entisols (NRCS 2014). Most soils in this MLRA are calcareous and at lower elevations generally have significant amounts of calcium carbonate, salts, and gypsum. Many of the soils show shallow (< 10 inches) or moderate depths (10-20 inches) to shale or sandstone bedrock and most are well drained. The dominant soil temperature regime is frigid and the dominant soil moisture regime is aridic (NRCS 2014). This MLRA has five major land resource units, including the semi-desert grass-shrub zone, salt desert zone, the foothill-mountain zone, the high plains grasslands zone and the lower foothill-mountain zone (NRCS 2014).

Exhibit I:

Sandy 7-9 Inch Ecological Site

Reclamation Implementation Plan

Site-specific conditions for sandy 7-9 inch ecological sites were characterized using data collected at 13 monitoring locations (Figure 1, Table 1). Long-term monitoring reference sites for sandy 7-9 inch ecological sites will be determined in coordination with the BLM Authorized Officer (AO). Any monitoring site that was used for ecological site characterization that is located outside of the CCSM Project limits of disturbance (LODs) may be suitable as a long-term monitoring reference site for sandy 7-9 inch ecological sites and may be used for future reclamation success monitoring purposes.

Table 1. Representative transects for sandy (7-9 inch) ecological sites.

	Pre-disturbance characterization sites
Transect numbers	CW_CL_03,
	CW_GR_14,
	CW_SA_09,
	NF_CL_02,
	NF_GR_06,
	NF_GR_07,
	NF_GR_08,
	NF_SA_01,
	NF_SA_06,
	NF_SA_07,
	NF_SA_08,
	NF_SA_09,
	NF_SU_10

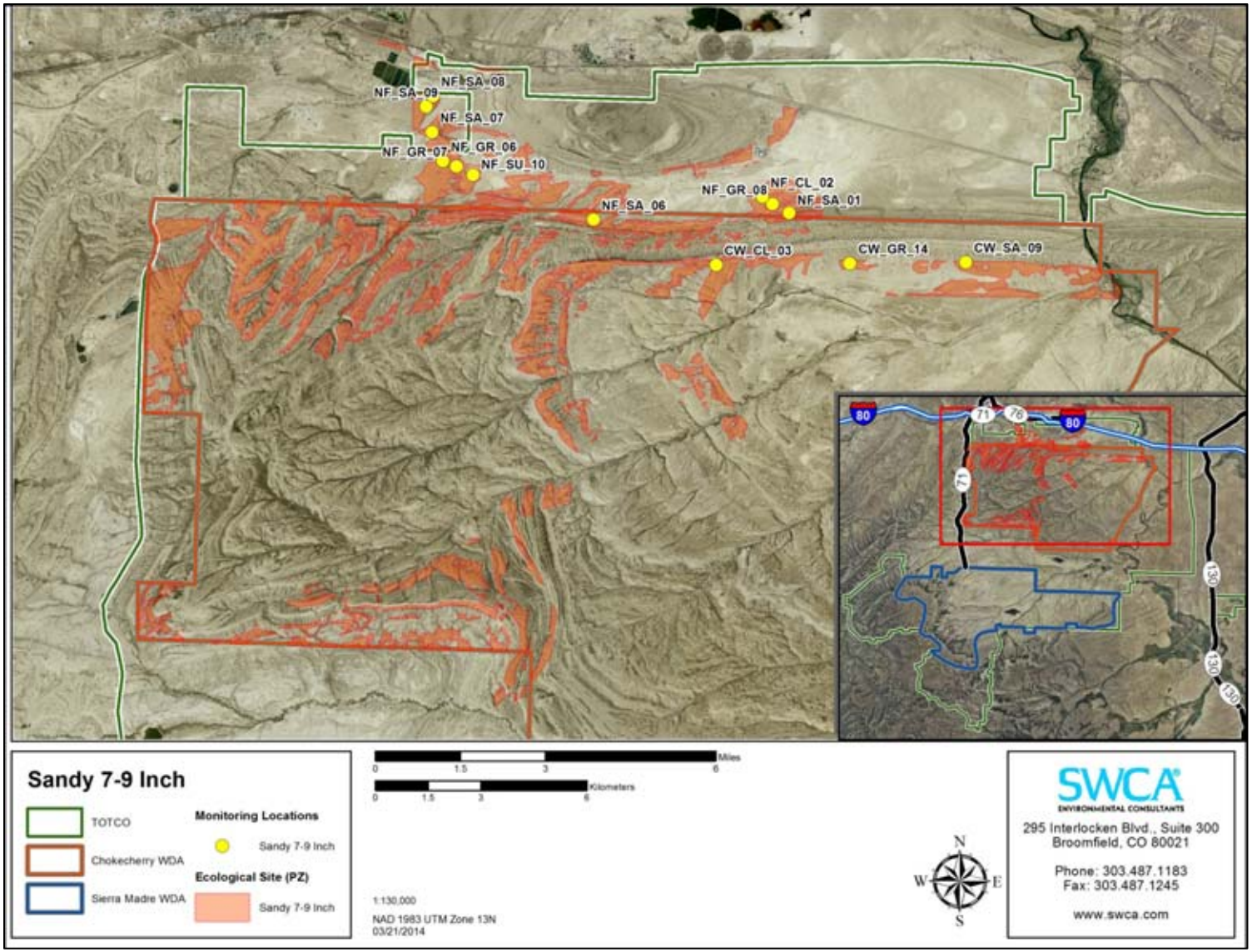

Figure 1. Locations of vegetation transects and soil samples used to characterize sandy 7-9 inch ecological sites.

Site Characteristics

Climate

Due to the high elevations and dry air, temperatures at sandy 7-9 inch ecological sites range significantly between summer and winter and daily maximum and minimums. The average annual air temperature is 41.8° F (25.6°F Avg. Min. to 58.1°F Avg. Max.). Extreme minimum temperatures can occur during the winter months when cold air outbreaks and winter storms move rapidly from northwest to southeast. Daytime winds are stronger than nighttime with some strong gusts associated with the passage of winter storms (NRCS 2011).

Abiotic Landscape Features

Sandy 7-9 inch ecological sites occur on upland positions on relatively flat to moderately sloping land. Slopes vary, but are typically between 0% and 30% on alluvial fans, hill sides, ridges, and stream terraces.

Soil Characteristics

Sandy 7-9 inch ecological sites are mostly deep and are well-drained to excessively drained (Table 2). Topsoil depth average 7.0 ± 1.2 inches (17.7 ± 3.1 centimeters) in depth. Lower soil horizon depths generally exceed 13 inches (33 cm). Surface soil textures range from loamy sand to silty clay loam. Subsurface soil textures range from sand to clay. Gravel modifiers are generally present in both topsoil and subsoil horizons although the volume of rock fragments is generally very low in both horizons. Sandy 7-9 inches ecological sites are typically not limited by restrictive layers in subsurface horizons; however, an increased volume of gravel and rock modifiers (greater than 15% volume) may increase limitations for vegetation establishment and growth.

Sandy 7-9 inch ecological sites are characterized by soils with moderately rapid to rapid infiltration and low to moderate runoff potential (NRCS 2011). Infiltration rates are highest, and runoff rates lowest where ground cover exceeds 75%. Rills and gullies are typically not present and surface water flow patterns are often indistinguishable (NRCS 2011). Chemical and physical crusts are rare to non-existent at these sites.

Soils are slightly-alkaline to very strongly alkaline with pH values between 7.5 and 9.1 and non-saline with electrical conductivities ranging between 0.00 and 0.22 dS/m (Table 2). Where soil pH ranges exceed 8.4, soils may have limited reclamation potential (LRP) and may need to be evaluated for potential soil treatment if vegetation reestablishment does not meet reclamation standards (see **Reclamation Procedures and Best Management Practices**). Soils are non-effervescent to slightly effervescent indicating presence of weakly covalent carbonates. Figures 2 and 3 illustrate the soil surface and soil profile characteristics of typical sandy 7-9 inch ecological sites in the CCSM Project Site.

Table 2. Soil characteristics typical of sandy 7-9 inch ecological sites.

Soil Characteristics	Description
Parent Material (Kind)	Alluvium
Parent Material (Origin)	Sedimentary Rock
Soil Depth	7.0 ± 1.2 inches (17.7 ± 3.1 cm)
Surface Texture	Loamy sand to silty clay loam
Subsurface Texture	Sand to clay
Surface Fragments	0-40%, sedimentary, caliche, fine to coarse gravel, angular to rounded
Subsurface Fragments	0-55%, sedimentary, fine to coarse gravel, angular to rounded
Electrical Conductivity	0.00-0.22 ds/m
Salinity Class	Non-saline
Soil Reaction (<20 inches)	7.5-9.1
pH Class	Slightly alkaline to very strongly alkaline
Carbonate Equivalent (<20 inches)	Non-effervescent to slightly effervescent

Figure 2. Representative soil surface and ground cover for sandy 7-9 inch ecological sites.

Figure 3. Representative soil profile for sandy 7-9 inch ecological sites.

Vegetation Characteristics

Plant communities associated with sandy 7-9 inch ecological sites in the CCSM Project Site are characterized by sparsely vegetated surfaces with 0-15% basal cover (Table 3). The remaining soil surface is characterized by biological soil crust (0-5%), litter cover (0-50%), rock fragments (0-25%) and unprotected soil (20-100%). Figure 4 provides a representative photograph of vegetation communities associated with sandy 7-9 inch sites in the CCSM Project Site.

When sandy 7-9 inch ecological sites are subjected to frequent and severe grazing, the woody species component and species such as big sagebrush (*Artemisia tridentata*) and rabbitbrush (*Chrysothamnus* and *Ericameria* spp.) will increase and bunchgrasses, such as Indian ricegrass (*Achnatherum hymenoides*) as well as threadleaf sedge (*Carex filifolia*), will decrease in frequency and production. In the absence of grazing and fire, sandy 7-9 inch ecological sites will convert to the heavy big sagebrush/bunchgrass state; conversely, under heavy continuous season-long grazing they will convert to the big sagebrush/rhizomatous wheatgrass state (NRCS 2011).

Figure 4. Characteristic vegetation communities associated with sandy 7-9 inch ecological sites in the CCSM Project Site.

Table 3. Vegetation characteristics typical of sandy 7-9 inch ecological sites.

Basal Vegetative Cover (LPI*)	0%–15%	
Biological Soil Crust and Lichen (LPI*)	0%–5%	
Litter Cover (LPI*)	0%–50%	
Surface Fragment/Rock Cover (LPI*)	0%–25%	
Unprotected Soil(LPI*)	20%–100%	
Representative Species and Top-Canopy Cover*	Wyoming big sagebrush	8.0% average (80% CI – 4.6-11.4%)
	Threadleaf sedge	7.6% average (80% CI – 3.8-11.5%)
	Sand dropseed	5.7% average (80% CI – 2.1-9.3%)
	Indian ricegrass	2.1% average (80% CI – 1.3-2.8%)
	Gardener's saltbush	1.7% average (80% CI – 0.6-2.8%)
Other Associated Species	James' galleta	
	Bluebunch wheatgrass	
	Shadscale	
	Low rabbitbrush	
	Prickly pear	

* Line point intercept

Reclamation Procedures and Best Management Practices

The reclamation procedures and Best Management Practices (BMPs) outlined in this Ecological Site Reclamation Implementation Plan will be implemented during reclamation of disturbed areas in sandy 7-9 inch ecological sites. PCW will implement these ecological site-specific measures in addition to the reclamation procedures and BMPs identified in the site-specific reclamation plans. Reclamation procedures and BMPs account for abiotic landscape features, soil characteristics, and vegetation characteristics and were designed to mitigate impacts to the abiotic and biotic factors characteristic of sandy 7-9 inch ecological sites and increase reclamation success. These procedures were developed in accordance with the BLM Wyoming Reclamation Policy (2012), management directives presented in the Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), RFO Reclamation Guidance (BLM 2011), Wyoming Department of Environmental Quality (WDEQ) Land Quality Division reclamation

guidelines (WDEQ 2007), State of Wyoming's reclamation guidance for wind development, and in coordination with BLM staff. This Ecological Site Reclamation Implementation Plan is intended to be adaptive and to take into account changing conditions and technologies. PCW, with concurrence from the BLM AO, may update, modify, or change the procedures contained in this plan if warranted due to site conditions or other factors.

Abiotic Landscape Features

The landscape will be reconstructed to achieve a desired topography, slope stability, and surface stability in accordance with the BLM Wyoming Reclamation Policy (2011) and as detailed in the CCSM Project Master Reclamation Plan (BLM 2012). Site stability will be re-established following landscape reconstruction by maximizing the geomorphic stability and topographic diversity of the reclaimed landscape (BLM 2011). Surface stability will be controlled by maintaining soil physical properties and treating compacted surfaces with accepted technologies.

In addition to the measures identified in each site-specific reclamation plan, PCW will avoid or minimize disturbance in areas with dunes in sandy 7-9 inch ecological sites, to the extent practicable.

Soil Handling

Soil associated with sandy 7-9 inch ecological sites will be managed in accordance with the BLM Wyoming Reclamation Policy (2012) and as detailed in the CCSM Project Master Reclamation Plan (2012) and site-specific reclamation plans for surface disturbing activities. Provisions are included below for segregating and marking stockpiles, as well as requirements to protect stockpiled material from erosion, contamination and degradation.

Due to their unconsolidated nature, sandy soils can be unstable when vegetation is removed (Table 2). Instability generally increases with increased slope. BMPs and erosion control measures will be necessary to mitigate impacts to the soil resource and increase reclamation success. BMPs and erosion control measures for soil handling within sandy 7-9 inch ecological sites are described below. These measures are in addition to the reclamation procedures and BMPs identified in the site-specific reclamation plans.

Soil salvage

- Topsoil depth of sandy 7-9 inch ecological sites in the CCSM Project Site average 7.0 ± 1.2 inches (17.7 ± 3.1 cm). Topsoil will therefore be excavated to a depth no greater than 8.2 inches (20.8 cm) based on the site-specific soil depths encountered (Table 2).
- Sandy 7-9 inch ecological sites are characterized by sparsely vegetated ground cover dominated by bunchgrasses and shrubs. Where adequate woody species occur, vegetation will be removed prior to soil salvage efforts. Any vegetation stripped will be placed on topsoil stockpiles to reduce erosion and provide biological inocula. Where woody species

are not present or provide little ground cover, vegetation will be stripped with the soil and incorporated into topsoil stockpiles to provide erosion control and biological inocula.

Soil stockpiling

- Topsoil taken from areas in sandy 7-9 inch ecological sites will be segregated and stockpiled separately from soils taken from other ecological sites.
- Stockpiles stored longer than two years will be seeded with the seed mix identified for the sandy 7-9 inch ecological site to prevent erosion and contribute organic materials.

Backfill, grading, compaction and contouring

- Disturbed areas will be recontoured to recreate physical characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features to the extent practicable.
- Recontoured surfaces will be stabilized and will have adequate surface roughness to reduce surface run-off.
- Pre-disturbance surface drainage patterns will be re-established to minimize erosion and restore the original hydrologic functions to the extent practicable.
- Compaction is expected to be minimal however any areas of compacted soil will be disked or harrowed prior to reclamation to reduce soil compaction.

Seed bed preparation

- Topsoil quality and reclamation suitability will be evaluated in areas identified as having limited reclamation potential (shallow soils, hyper-saline soils, hyper-sodic soils, high clay content, etc.) to determine if soil treatments and amendments are necessary.
- Topsoil quality and reclamation suitability will be evaluated during pre-construction site characterization and or prior to construction in limited reclamation potential areas.
- Soil treatments will be implemented in sensitive soils to improve suitable topsoil conditions, with the concurrence of the BLM AO, as needed. Suitable topsoil criteria and thresholds for specific attributes will be used to identify treatment process, intensity, and frequency (Table 4). The goal of all soil treatments will be to achieve “Good to Fair” topsoil suitability criteria for selected soil attributes and success of treatment will be determined through monitoring vegetation reestablishment and cover, or additional soil testing if necessary.
- Construction activities will be suspended when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting.

Table 4. Criteria to Establish Suitable Topsoil (or Topsoil Substitutes)[1].

Parameter	Suitability			Unsuitable
	Good	Fair	Poor	
pH	6.4–8.0	6.0–6.4 8.0–8.4	5.0–6.0 8.4–9.0	<5.0 >9.0
EC (conductivity)[2] mmhos/cm	0–4	4–8	8–16	>16
Saturation Percentage	25–80		>80 <25	--
Texture[3]	SL, L, SIL, SCL, VFSL, FSL	CL, SICL, SC, LS, LFS	C, SIC, S	--
SAR	<6	6–10	10–15 10–12[4]	>15 >12[4]
Selenium	<2.0 ppm			>2.0 ppm
Boron	<5.0 ppm			>5.0 ppm
Calcium Carbonate	0–15%	15–30%	>30%	--
Coarse Fragments (% volume)				
3–10 inches	0–15	15–25	25–35	>35
>10 inches	0–3	3–7	7–10	>10
Consistency[5]				
Moist	VFR, FR	LO, FI	VFI, EXFI	--
Dry	LO, SO	SH, H	VH	

1 Topsoil suitability criteria adapted from Rawlins Field Office Reclamation Guidance (BLM 2011) and Wyoming Department of Environmental Quality Land Quality Division (1994, 2007)

2 EC (conductivity) of >8 may prove difficult for revegetation.

3 Soil texture (Schoeneberger et al. 2009):

C	=	Clay	SC	=	Sandy clay
CL	=	Clay loam	SCL	=	Sandy clay loam
FSL	=	Fine sandy loam	SIC	=	Silty clay
L	=	Loam	SICL	=	Silty clay loam
LFS	=	Loamy fine sand	SIL	=	Silt loam
LS	=	Loamy sand	SL	=	Sandy loam
S	=	Sand	VFSL	=	Very fine sandy loam

4 For fine-textured soils (clay >40%) (Gee et al. 1978).

5 Consistency (Schoeneberger et al. 2009):

EXFI	=	Extremely firm	SH	=	Semi-hard
FI	=	Firm	SO	=	Soft
FR	=	Friable	VFI	=	Very firm
H	=	Hard	VFR	=	Very friable
LO	=	Loose	VH	=	Very hard

Vegetation Handling

The primary objective of revegetation is to establish the species composition, diversity, structure, and total ground cover appropriate for the desired plant community (BLM 2012). In accordance with BLM Wyoming Reclamation Policy (2012), proper seeding mixtures will be used to reclaim disturbed areas on federal lands with native vegetation, as detailed in the CCSM Project Master Reclamation Plan (2012). Soil conditioning, de-compaction, and topsoil protection measures will be implemented to reestablish topsoil properties and to protect the seeding surface, as described in the CCSM Project Master Reclamation Plan (BLM 2012), site-specific reclamation plans, and in compliance with BLM Wyoming Reclamation Policy (2012).

Seed mixtures will be tailored to establish species diversity, composition, and ground cover appropriate for the desired plant community that has been documented for sandy 7-9 inch ecological sites in the CCSM Project Site. Seed mixtures may be refined based on soil management, wildlife, or rangeland needs. The seed pick list for sandy 7-9 inch ecological sites was developed based on the RFO ecological site specific pick lists combined with site-specific vegetation data and composition (Table 5) (BLM 2008, 2011). The use of non-native species on federal lands will only be considered as the result of the documented failure to revegetate any area with native species and will be implemented in coordination with the BLM AO.

BMPs and protective measures for successfully reestablishing site vegetation are described below.

- Seeding rates for the sandy 7-9 inch ecological site will be calculated using the NRCS worksheet available on the Wyoming Reclamation and Restoration Center Web site (http://uwyo.edu/WRRC) or other appropriate tool.
- Proper timing will be established for each specific seed mix. Dormant seeding after October 15 before the ground freezes or before April 15 is anticipated to be most effective. Alternate timing for seeding activities may be appropriate and will be used if necessary with concurrence from the BLM AO.
- Vegetation establishment and cover will be used as a baseline to determine if soil amendments are needed (Table 4). If necessary, the topsoil will be tested to identify appropriate amendments prior to site preparation (see *Section Seed Bed Preparation*) and or seeding.
- After seeding, furrows or pits will be created to roughen the soil surface, increase moisture infiltration, capture blowing snow, and slow the surface velocity of wind and water to reduce erosion and sedimentation.
- As practicable, livestock will be excluded from reclaimed areas until appropriate levels of site stabilization and revegetation are achieved.

Table 5. Recommended seed pick list for sandy ecological sites.

Name	***Scientific***	**Variety**	**SYMBOL**
Grasses			
Thickspike wheatgrass	*Elymus lanceolatus*	Critana	ELLA3
Western wheatgrass	*Pascopyrum smithii*	Rosana	PASM
Indian ricegrass	*Achnatherum hymenoides*	Rimrock (Nez Par)	ACHY
Bottlebrush squirreltail	*Elymus elymoides*	Sand hollow	ELEL
Slender wheatgrass	*Elymus trachycaulus*	Pryor (San Luis)	ELTR
Little bluegrass "Sandberg"	*Poa secunda*	High Plains	POSE
Bluebunch wheatgrass	*Pseudoroegneria spicata*	Secor	PSSP6
Needle and thread	*Hesperostipa comata*		HECO26
Threadleaf sedge	*Carex filifolia*		CAFI
Shrubs			
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*		ARTRW8
Shadscale	*Atriplex confertifolia*		ATCO
Yellow rabbitbrush	*Chrysothamnus viscidiflorus*		CHVI8
Green rabbitbrush	*Ericameria nauseosa*		ERNA10
Forbs			
Lewis' flax	*Linum lewisii*		LILI
Rocky Mountain beeplant	*Cleome serrulata*	Appar	CLSE
Western yarrow	*Achillea millefolium* var. *occidentalis*		ACMI2
Textile onion	*Allium textile*		ALTE
Scarlet globemallow	*Sphaeralcea coccinea*		SPCO
Western wallflower	*Erysium capitatum*		ERCA14
Spiny phlox	*Phlox hoodii*		PHHO

Exhibit II:

Clayey 7-9 Inch Ecological Site

Reclamation Implementation Plan

Site-specific conditions for clayey 7-9 inch ecological sites were characterized using data collected at 11 locations (Figure 1, Table 1). Long-term monitoring reference sites for clayey 7-9 inch ecological sites will be determined in coordination with the BLM Authorized Officer (AO). Any monitoring site that was used for ecological site characterization that is located outside of the CCSM Project limits of disturbance (LODs) may be suitable as a long-term monitoring reference site for clayey 7-9 inch ecological sites and may be used for future reclamation success monitoring purposes.

Table 1. Representative transects for clayey 7-9 inch ecological sites in the CCSM Project Site.

	Pre-disturbance characterization sites
Transect numbers	CB_GR_12, CB_SA_08, CW_CL_04, CW_IC_01, CW_SA_08, NF_CL_03, NF_GR_03, NF_GR_04, NF_SL_01, NF_SU_09, NF_SU_11

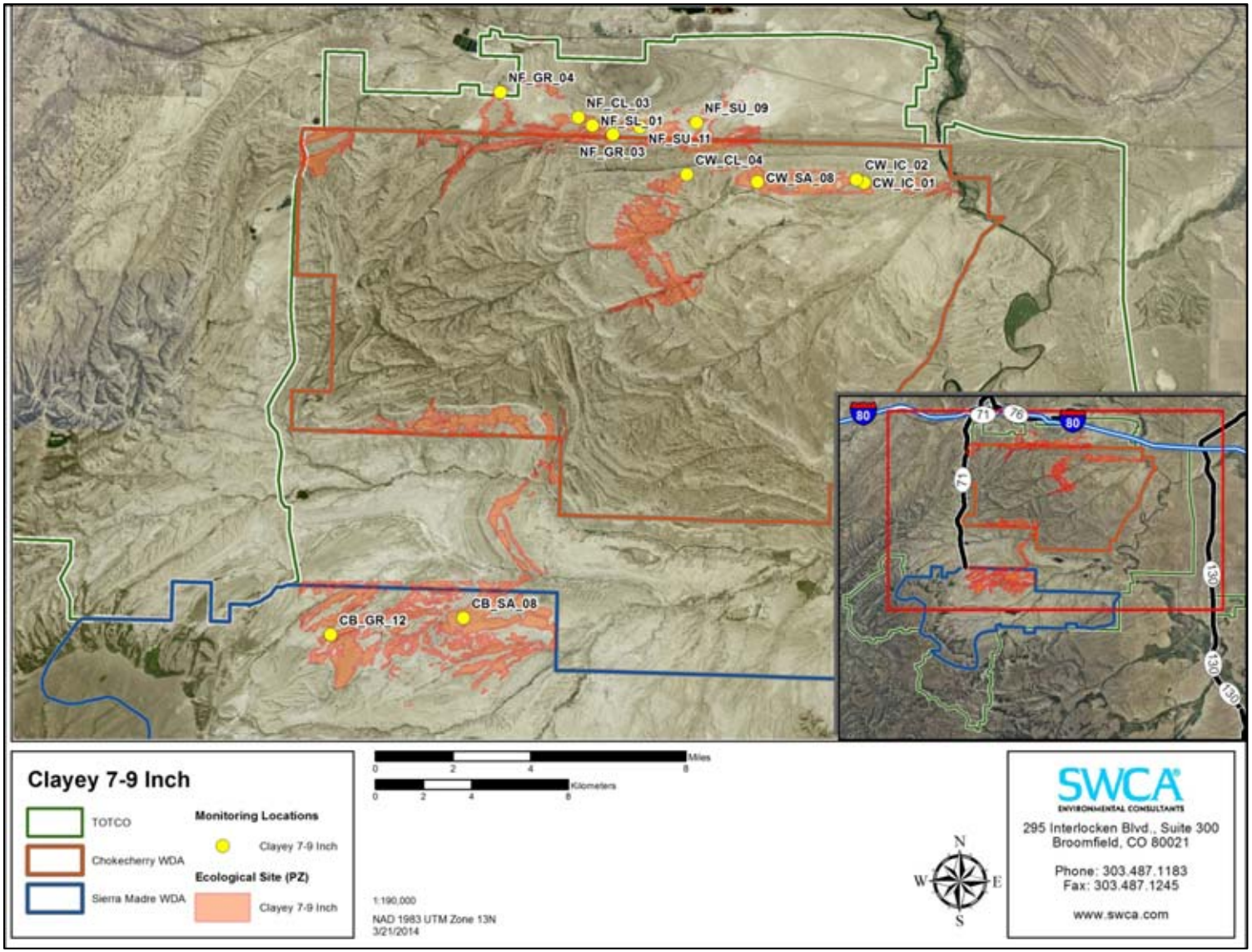

Figure 1. Location of vegetation transects and soil samples used to characterize clayey 7-9 inch ecological sites in the CCSM Project Site.

Site Characteristics

Climate

Due to the high elevations and dry air, temperatures at clayey 7-9 inch ecological sites range significantly between summer and winter and daily maximum and minimums (e.g. 2.3°F minimums in January to 85.3° F maximums in July). Extreme minimum temperatures can occur during the winter months when cold air outbreaks and winter storms move rapidly from northwest to southeast. Daytime winds are stronger than nighttime with some strong gusts associated with the passage of winter storms (NRCS 2005).

Abiotic Landscape Features

Clayey 7-9 inch ecological sites in the CCSM Project Site occur on all exposures along terrace breaks, valley bottoms, and fans. Slopes vary, but are typically between 0% and 5%.

Soil Characteristics

Clayey 7-9 inch ecological sites within the CCSM Project Site are characterized by moderately deep to very deep fine textured soils. The uppermost soil horizon is characterized by sandy loam to silty clay and averages 13.4 ± 1.9 inches (34.0 ± 4.7 cm) in depth. Lower soil horizons are characterized by sandy loam to clay textures with increased clay content. Soil cracking (not severe) occurs during the dry summer months, especially where the plant cover has been reduced. Root penetration is somewhat restricted due to the fine textures, clay structures in the subsurface layers and reduced depth of moisture penetration.

Clayey 7-9 inch ecological sites in the CCSM Project Site are characterized by soils with very slow to moderately slow infiltration and moderate to high runoff potential (NRCS 2005). Infiltration rates are highest, and runoff rates lowest where ground cover exceeds 75%. Rills and gullies are typically not present and surface water flow patterns are often indistinguishable (NRCS 2005). Chemical and physical crusts are rare to non-existent at these sites (NRCS 2005).

Soils are slightly alkaline to very strongly alkaline with pH values between 7.5 and 9.5 and non-saline to very slightly saline with electrical conductivities ranging between 0.03 and 0.70 dS/m (Table 2). Where soil pH ranges exceed 8.4 soils may have limited reclamation potential (LRP) may need to be evaluated for potential soil treatment (see **Reclamation Procedures and Best Management Practices**). Soils are non-effervescent to strongly effervescent indicating weakly and strongly covalent carbonates. Figures 2 and 3 illustrate the soil surface and soil profile characteristics of a typical clayey 7-9 inch site in the CCSM Project Site.

Table 2. Soil characteristics typical of clayey 7-9 inch ecological sites.

Soil Characteristics	Description
Parent Material (Kind)	Alluvium
Parent Material (Origin)	Mixed
Depth	13.4 ± 1.9inches (34.0 ± 4.7 cm)
Surface Texture	Sandy loam to silty clay
Subsurface Texture	Sandy loam to clay
Surface Fragments	0-75%, sedimentary, fine to coarse gravel, angular to rounded
Subsurface Fragments	0-90%, sedimentary, caliche,fine to coarse gravel, angular to subrounded
Electrical Conductivity	0.08-0.14 dS/m
Salinity Class	Non-saline to very slightly saline
Soil Reaction (<20 inches)	8.5-9.2
pH Class	Slightly alkaline to very strongly alkaline
Carbonate Equivalent (<20 inches)	Non-effervescent to violently effervescent

Figure 2. Representative soil surface and ground cover for clayey 7-9 inch ecological sites in the CCSM Project Site

Figure 3. Representative soil profile for clayey 7-9 inch sites in the CCSM Project Site.

Vegetation Characteristics

Plant communities associated with clayey 7-9 inch ecological sites in the CCSM Project Site are characterized by sparsely vegetated surfaces with 0%–10% basal cover (Table 3). The remaining 90-100% of the soil surface is characterized by unprotected soils (30-85%), litter (10-35%) and rock fragments (0-40%). Figure 2 provides representative photographs of vegetation communities in shallow clayey 7-9 inch sites in the CCSM Project Site.

Where clayey 7-9 inch ecological sites are subjected to frequent and severe grazing, the woody species component including species such as Gardner's saltbush (*Atriplex gardneri),* big sagebrush (*Artemisia tridentata*), and rabbitbrush (*Chrysothamnus* and *Ericameria* spp.) will increase. Also, Indian ricegrass (*Achnatherum hymenoides*) and threadleaf sedge (*Carex filifolia*) will decrease in frequency and production, in turn increasing unprotected soil exposure. In the absence of grazing and fire, clayey 7-9 inch ecological sites will convert to the heavy big sagebrush/Indian ricegrass state; conversely, under heavy continuous season-long grazing they will convert to the big sagebrush/bare ground state wheatgrass state (NRCS 2011).

Table 3. Vegetation characteristics typical of clayey 7-9 inch ecological sites.

Basal Vegetative Cover (LPI*)	0%–10%	
Biological Soil Crust and Lichen (LPI*)	0%–20%	
Litter Cover (LPI*)	10%–35%	
Surface Fragment/Rock Cover (LPI*)	0%–40%	
Unprotected Soil(LPI*)	30%–85%	
Representative Species and Top-Canopy Cover*	Gardner's saltbush	6.5% average (80% CI – 2.8-10.2%)
	Threadleaf sedge	4.4% average (80% CI – 0.7-8.0%)
	Shadscale saltbush	2.6% average (80% CI – 1.4-3.9%)
	Birdfoot sagebrush	2.3% average (80% CI – 0.4-4.2%)
	Indian ricegrass	2.2% average (80% CI – 1.2-3.1%)

Other Associated Species	Wyoming big sagebrush
	Alkali sacaton
	Greasewood
	Phlox
	James' galleta

* Line point intercept

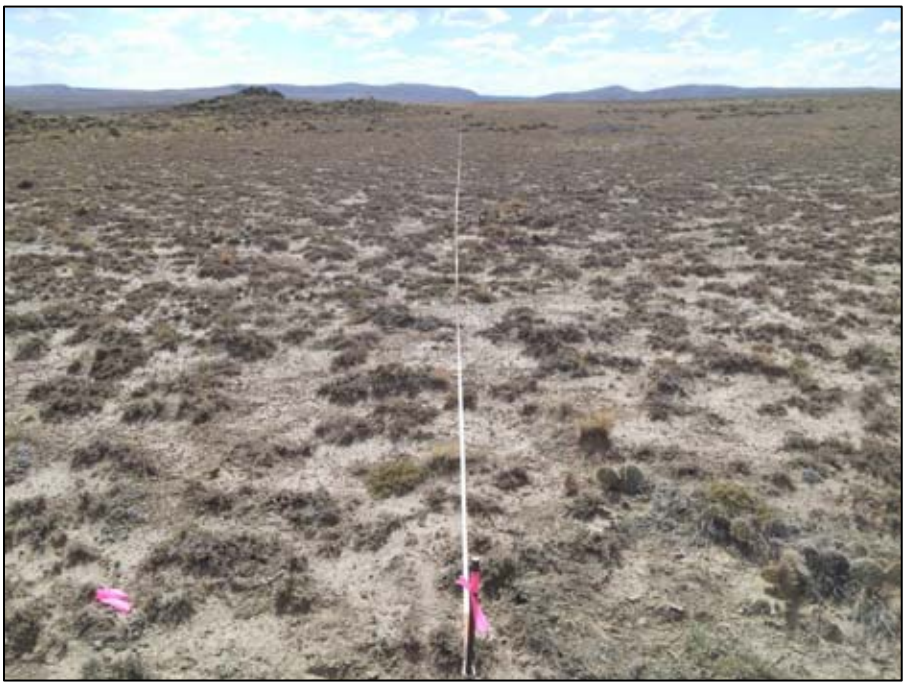

Figure 4. Characteristic vegetation communities associated with clayey 7-9 inch ecological sites in the CCSM Project Site.

Reclamation Procedures and Best Management Practices

The reclamation procedures and Best Management Practices (BMPs) outlined in this Ecological Site Reclamation Implementation Plan will be implemented during reclamation of disturbed areas in clayey 7-9 inch ecological sites. PCW will implement these ecological site-specific measures in addition to the reclamation procedures and BMPs identified in each site-specific reclamation plan.

Reclamation procedures and BMPs account for abiotic landscape features, soil characteristics, and vegetation characteristics and were designed to mitigate impacts to the abiotic and biotic factors characteristic of clayey 7-9 inch ecological sites and increase reclamation success. These procedures were developed in accordance with the BLM Wyoming Reclamation Policy (2012), management directives presented in the Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), RFO Reclamation Guidance (BLM 2011), Wyoming Department of Environmental Quality (WDEQ) Land Quality Division reclamation guidelines (WDEQ 2007), State of Wyoming's reclamation guidance for wind development, and in coordination with BLM staff. This Ecological Site Reclamation Implementation Plan is intended to be adaptive and to take into account changing conditions and technologies. PCW, with concurrence from the BLM AO, may update, modify, or change the procedures contained in this plan if warranted due to site conditions or other factors.

Abiotic Landscape Features

The landscape will be reconstructed to achieve a desired topography, slope stability, and surface stability in accordance with the BLM Wyoming Reclamation Policy (2009) and as detailed in the CCSM Project Master Reclamation Plan (BLM 2012). Site stability will be re-established following landscape reconstruction by maximizing the geomorphic stability and topographic diversity of the reclaimed landscape (BLM 2009). Surface stability will be controlled by maintaining soil physical properties and treating compacted surfaces with accepted technologies.

Reclamation procedures and BMPs to address abiotic landscape features are identified in each site-specific reclamation plan.

Soil Handling

Soil associated with clayey 7-9 inch ecological sites will be managed in accordance with the BLM Wyoming Reclamation Policy (2012) and as detailed in the CCSM Master Reclamation Plan (2012) and site-specific reclamation plans for surface disturbing activities. Provisions are included below for segregating and marking stockpiles, as well as requirements to protect stockpiled material from erosion, contamination and degradation.

Soil characteristics of clayey 7-9 inch ecological sites can be unstable if clay content impedes drainage and facilitates erosion resulting from run-off (Table 2). BMPs and erosion control measures will be necessary to mitigate impacts to the soil resource and increase reclamation

success. BMPs and erosion control measures for soil handling are described below. These measures are in addition to reclamation procedures and BMPSs identified in each site specific reclamation plan. Erosion control measures will be consistent with those presented in the site specific erosion control plans.

Soil salvage

- Topsoil at clayey 7-9 inch sites averages 13.4 ± 1.9 inches (34.0 ± 4.7 cm); topsoil will be excavated therefore to a depth no greater than 15.3 inches (38.9 cm) based on the site-specific soil depths encountered (Table 2).
- Clayey 7-9 inch ecological sites are characterized by sparse vegetation dominated by bunchgrasses and other grass-like species. Where adequate woody species occur, vegetation will be removed prior to soil salvage efforts. Any vegetation stripped will be placed on topsoil stockpiles to reduce erosion and provide biological inocula. Where woody species are not present or provide little ground cover, vegetation will be stripped with the soil and incorporated into topsoil stockpiles to provide erosion control and biological inocula.

Soil Stockpiling

- Topsoil taken from areas in clayey 7-9 inch ecological sites will be segregated and stockpiled separately from soils taken from other ecological sites.
- Subsoils taken from areas in clayey 7-9 inch ecological site will be segregated and stockpiled separately from soils taken from other ecological sites.
- Stockpiles stored longer than two years will be seeded with the seed mix identified for clayey 7-9 inch ecological site to prevent erosion and contribute organic materials.

Backfill, grading, compaction and contouring

- Disturbed areas will be re-contoured to recreate physical characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features to the extent practicable.
- Re-contoured surfaces will be stabilized and will have adequate surface roughness to reduce surface run-off.
- Pre-disturbance surface drainage patterns will be re-established to minimize erosion and restore the original hydrologic functions to the extent practicable.
- Due to the nature of soils at the clayey 7-9 inch ecological sites, some level of compaction is anticipated. Any areas of compacted soil will be disked or harrowed, prior to reclamation to reduce soil compaction.

Seed bed preparation

- Topsoil quality and reclamation suitability will be evaluated in areas identified as having limited reclamation potential (Saline soils, Sodic soils, clay soils etc.)etc.) to determine if soil treatments and amendments are necessary.
- Topsoil quality and reclamation suitability will be evaluated during pre-construction site characterization and or prior to construction in limited reclamation potential areas.
- Soil treatments will be implemented in sensitive soils to improve suitable topsoil conditions, with the concurrence of the BLM AO, as needed. Suitable topsoil criteria and thresholds for specific attributes will be used to identify treatment process, intensity, and frequency (Table 4). The goal of all soil treatments will be to achieve "Good to Fair" topsoil suitability criteria for selected soil attributes and success of treatment will be determined through monitoring vegetation reestablishment and cover, or additional soil testing if necessary.
- If soil amendments are not applied to stockpiled soils from the clayey 7-9 inch ecological sites, these soils will be protected from exposure once reapplied to prevent heavy crusting to the extent practicable.
- Physical barriers such as carbonate layers that may be prevalent in soils from the clayey 7-9 inch ecological sites will be mitigated by ripping or deep chiseling.
- Construction activities will be suspended when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting.
- Ponding or gullying is possible in fine textured clayey soils. Reclamation monitoring will inspect for evidence of ponding or gullying. When ponding of gullying is present, appropriate measures will be determined in coordination with the BLM AO.

Table 4. Criteria to Establish Suitable Topsoil (or Topsoil Substitutes)[1].

Parameter	Suitability			Unsuitable
	Good	Fair	Poor	
pH	6.4–8.0	6.0–6.4 8.0–8.4	5.0–6.0 8.4–9.0	<5.0 >9.0
EC (conductivity)[2] mmhos/cm	0–4	4–8	8–16	>16
Saturation Percentage	25–80		>80 <25	--
Texture[3]	SL, L, SIL, SCL, VFSL, FSL	CL, SICL, SC, LS, LFS	C, SIC, S	--
SAR	<6	6–10	10–15 10–12[4]	>15 >12[4]
Selenium	<2.0 ppm			>2.0 ppm
Boron	<5.0 ppm			>5.0 ppm
Calcium Carbonate	0–15%	15–30%	>30%	--
Coarse Fragments (% volume)				
3–10 inches	0–15	15–25	25–35	>35
>10 inches	0–3	3–7	7–10	>10
Consistency[5]				
Moist	VFR, FR	LO, FI	VFI, EXFI	--
Dry	LO, SO	SH, H	VH	

1 Topsoil suitability criteria adapted from Rawlins Field Office Reclamation Guidance (BLM 2011) and Wyoming Department of Environmental Quality Land Quality Division (1994, 2007)

2 EC (conductivity) of >8 may prove difficult for revegetation.

3 Soil texture (Schoeneberger et al. 2009):

C	=	Clay	SC	=	Sandy clay
CL	=	Clay loam	SCL	=	Sandy clay loam
FSL	=	Fine sandy loam	SIC	=	Silty clay
L	=	Loam	SICL	=	Silty clay loam
LFS	=	Loamy fine sand	SIL	=	Silt loam
LS	=	Loamy sand	SL	=	Sandy loam
S	=	Sand	VFSL	=	Very fine sandy loam

4 For fine-textured soils (clay >40%) (Gee et al. 1978).

5 Consistency (Schoeneberger et al. 2009):

EXFI	=	Extremely firm	SH	=	Semi-hard
FI	=	Firm	SO	=	Soft
FR	=	Friable	VFI	=	Very firm
H	=	Hard	VFR	=	Very friable
LO	=	Loose	VH	=	Very hard

Vegetation Handling

The primary objective of revegetation is to establish the species composition, diversity, structure, and total ground cover appropriate for the desired plant community (BLM 2012). In accordance with BLM Wyoming Reclamation Policy (2012), proper seeding mixtures will be used to reclaim disturbed areas on federal lands with native vegetation, as detailed in the CCSM Project Master Reclamation Plan (2012). Soil conditioning, de-compaction, and topsoil protection measures will be implemented to reestablish topsoil properties and to protect the seeding surface, as described in the CCSM Project Master Reclamation Plan (BLM 2012), site-specific reclamation plans, and in compliance with BLM Wyoming Reclamation Policy (2012).

Seed mixtures will be tailored to establish species diversity, composition, and ground cover appropriate for the desired plant community that has been documented for clayey 7-9 inch ecological sites in the CCSM Project Site.

Seed mixtures may be refined based on soil management, wildlife, or rangeland needs. The seed pick list for clayey 7-9 inch ecological sites was developed based on the RFO ecological site specific pick lists combined with site-specific vegetation data and composition (Table 5) (BLM 2008, 2011). The use of non-native species on federal lands will only be considered as the result of the documented failure to revegetate any area with native species and will be implemented in coordination with the BLM AO.

Recommended BMPs and protective measures for successfully reestablishing site vegetation are described below.

- Seeding rates for the clayey 7-9 inch ecological site will be calculated using the NRCS worksheet available on the Wyoming Reclamation and Restoration Center Web site (http://uwyo.edu/WRRC) or other appropriate tool.
- Proper timing will be established for each specific seed mix. Dormant seeding after October 15 before the ground freezes or before April 15 is anticipated to be most effective. Alternate timing for seeding activities may be appropriate and will be used if necessary with concurrence from the BLM AO.
- Vegetation establishment and cover will be used as a baseline to determine if soil amendments are needed (Table 4). If necessary, the topsoil will be tested to identify appropriate amendments prior to site preparation (see *Section Seed Bed Preparation*) and or seeding.
- After seeding, furrows or pits will be created to roughen the soil surface, increase moisture infiltration, capture blowing snow, and slow the surface velocity of wind and water to reduce erosion and sedimentation.

- Clayey 7-9 inch ecological sites have relatively low productivity potential and can be sensitive to year-round grazing activities. As practicable, livestock will be excluded from reclaimed areas until appropriate levels of site stabilization and revegetation are achieved.

Table 5. Recommended seed pick list for clayey ecological sites.

Name	*Scientific*	Variety	SYMBOL
Grasses			
Thickspike wheatgrass	*Elymus lanceolatus*	Critana	ELLA3
Western wheatgrass	*Pascopyrum smithii*	Rosana	PASM
Indian ricegrass	*Achnatherum hymenoides*	Rimrock (Nez Par)	ACHY
Bottlebrush squirreltail	*Elymus elymoides*	Sand hollow	ELEL
Slender wheatgrass	*Elymus trachycaulus*	Pryor (San Luis)	ELTR
Little bluegrass "Sandberg"	*Poa secunda*	High Plains	POSE
Bluebunch wheatgrass	*Pseudoroegneria spicata*	Secor	PSSP6
Galleta grass	*Pleuraphis jamesii*	Viva	PLJA
Shrubs			
Wyoming big sagebrush	*Artemisia tridentata* ssp. *wyomingensis*		ARTRW8
Gardner's saltbush	*Atriplex gardneri*		ATGA
Fourwing saltbush	*Atriplex canaescens*	Wytana	ATCA2
Shadscale	*Atriplex confertifolia*		ATCO
Green rabbitbrush	*Ericameria nauseosa*		ERNA10
Yellow rabbitbrush	*Chrysothamnus viscidiflorus*		CHVI8
Winterfat	*Krascheninnikovia lanata*	Open Range	KRLA
Forbs			
Lewis' flax	*Linum lewisii*		LILI
Rocky Mountain beeplant	*Cleome serrulata*	Appar	CLSE
Western yarrow	*Achillea millefolium* var. *occidentalis*		ACMI2
Textile onion	*Allium textile*		ALTE

Name	***Scientific***	**Variety**	**SYMBOL**
Scarlet globemallow	*Sphaeralcea coccinea*		SPCO
Western wallflower	*Erysium capitatum*		ERCA14
Spiny phlox	*Phlox hoodii*		PHHO
Desert biscuitroot	*Lomatium foeniculaceum*		LOFO

Exhibit III:

Saline Lowland 7-9 inch Ecological Site

Reclamation Implementation Plan

Site-specific conditions for saline lowland 7-9 inch ecological sites were characterized using data collected at 8 monitoring locations (Figure 1, Table 1). Site characteristics, including physiography, soil, and vegetation attributes were described at each location. Long-term monitoring reference sites for saline lowland 7-9 inch ecological sites will be determined in coordination with the BLM Authorized Officer (AO). Any monitoring site that was used for ecological site characterization that is located outside of the CCSM Project limits of disturbance (LODs) may be suitable as a long-term monitoring reference site for saline lowland 7-9 inch ecological sites and may be used for future reclamation success monitoring purposes.

Table 1. Representative transects for saline lowland 7-9 inch ecological sites in the CCSM Project Site.

	Pre-disturbance characterization sites
Transect numbers	CW_SL_04, NF_SL_05, NF_SL_06, NF_SU_01, NF_SU_02, NF_SU_03, NF_SU_04, NF_SU_08

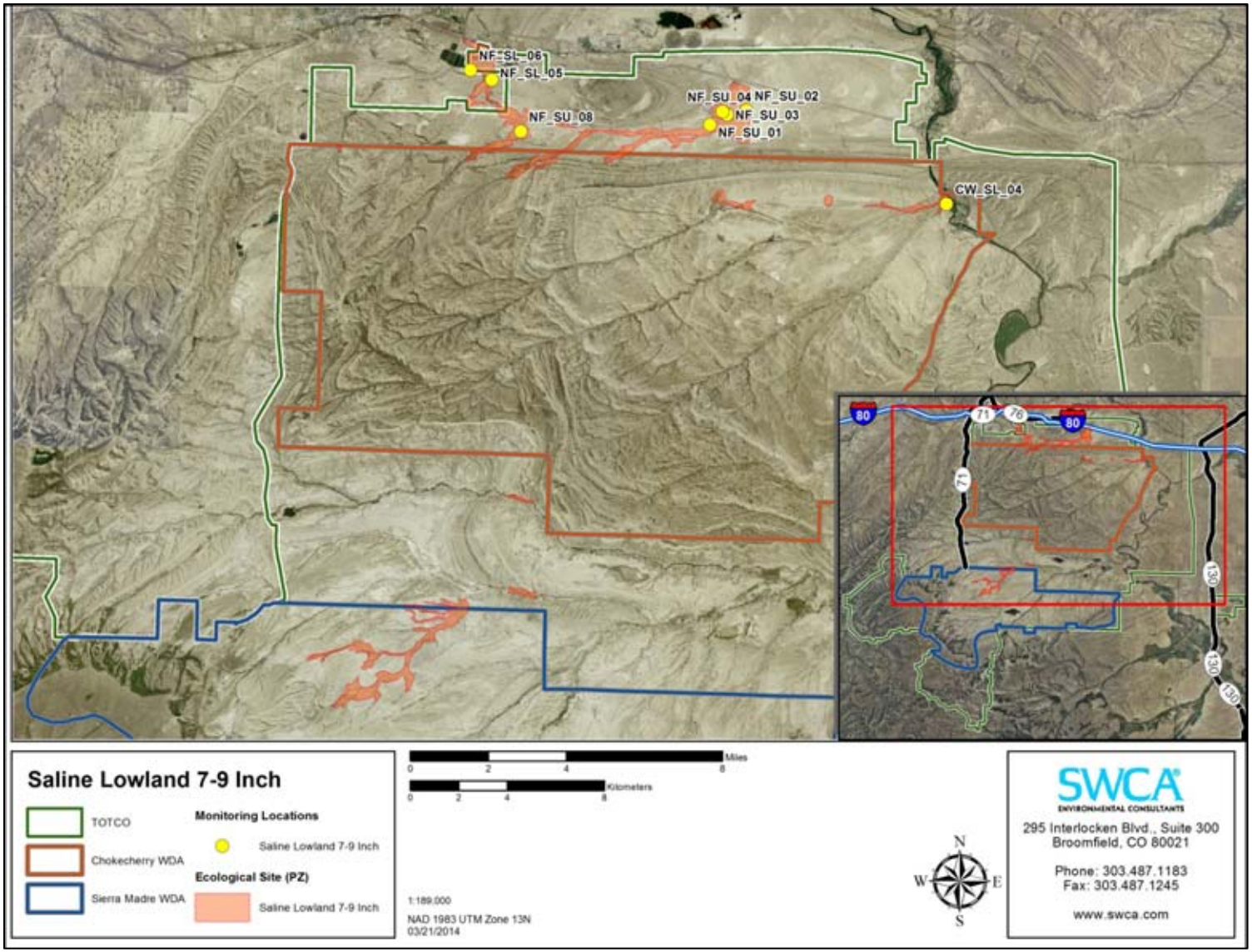

Figure 1. Locations of vegetation transects and soil samples used to characterize saline lowland 7-9 inch ecological sites in the CCSM Project Site.

Site Characteristics

Climate

Due to the high elevations and dry air, temperatures at saline lowland 7-9 inch sites range significantly between summer and winter and daily maximum and minimums. The average annual air temperature is 41.8° F (25.6°F Avg. Min. to 58.1°F Avg. Max.). Extreme minimum temperatures can occur during the winter months when cold air outbreaks and winter storms move rapidly from northwest to southeast. Daytime winds are stronger than nighttime with some strong gusts associated with the passage of winter storms (NRCS 2011).

Abiotic Landscape Features

Saline lowland 7-9 inch ecological sites in the CCSM Project Site can occur on lowland positions or on gently sloping land along streams at all exposures. Slopes vary, but are typically between 0% and 20%.

Soil Characteristics

Saline lowland 7-9 inch ecological sites within the CCSM Project Site are characterized by mineral soils with little to no organic material. Topsoil depth average 3.1 ± 0.4 inches (8.0 ± 1.0 cm) in depth. Lower soil horizon depths generally exceed 20 inches (50 cm). The uppermost soil horizon is characterized by sandy clay loam to silty clay soil textures. Lower soil horizons are characterized by loamy sands to clay soil textures. Subsurface soils often have increased soluble salt concentrations (NRCS 2011). Sodic horizons, that are typical of this soil type, could form a restrictive layer that impedes air and water movement. Sodicity of the surface soil is likely to cause dispersion of surface aggregates, resulting in surface crusts that inhibit infiltration.

Saline lowland 7-9 inch ecological sites in the CCSM Project Site are characterized by soils with moderate to rapid infiltration and moderate to high runoff potential. Infiltration rates are highest, and runoff rates lowest where ground cover exceeds 75%. Rills and gullies are typically not present and surface water flow patterns are often indistinguishable (NRCS 2011). Chemical and physical crusts are often present at these sites.

Soils are moderately alkaline to very strongly alkaline with pH values between 7.9 and 9.2 and non- saline to very strongly saline with electrical conductivities ranging between 0.1 and 5.7 dS/m, with salinity increasing with soil depth. Where soil pH ranges exceed 8.4, soils may have limited reclamation potential (LRP) and may need to be evaluated for potential soil treatment (see **Reclamation Procedures and Best Management Practices**). Soils are very slightly effervescent to strongly effervescent indicating presence of weakly and strongly covalent carbonates.

Figures 2 and 3 illustrate the soil surface and soil profile characteristics of a typical saline lowland 7-9 inch ecological site in the CCSM Project Site.

Table 2. Soil characteristics typical of saline lowland 7-9 inch ecological sites.

Soil Characteristics	Description
Parent Material (Kind)	Alluvium Residuum
Parent Material (Origin)	Sedimentary/Mixed
Soil Depth	3.1 ± 0.4 inches (8.0 cm ± 1.0 cm)
Surface Texture	Sandy clay loam to silty clay
Subsurface Texture	Loamy sand to clay
Surface Fragments	0% cover
Subsurface Fragments	0% volume
Electrical Conductivity	0.1-5.7 dS/m
Salinity Class	Non- saline to very strongly saline
Soil Reaction (<20 inches)	7.9 to 9.2
pH Class	Moderately alkaline to very strongly alkaline
Carbonate Equivalent (<20 inches)	Very slightly effervescent to strongly effervescent

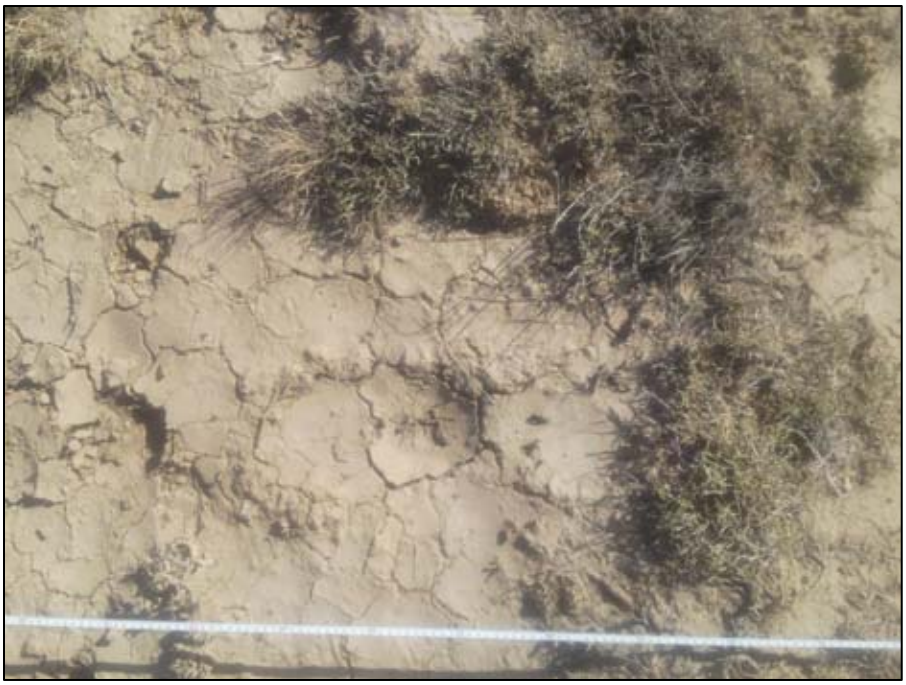

Figure 2. Representative soil surface and ground cover for saline lowland 7-9 inch sites in the CCSM Project Site

Figure 3. Representative soil profile for saline lowland 7-9 inch sites in the CCSM Project Site.

Vegetation Characteristics

Plant communities associated with saline lowland 7-9 inch ecological sites in the CCSM Project Site are characterized by sparsely vegetated surfaces with 0%–10% basal cover (Table 3). The remaining 90%–100% of the soil surface is characterized by unprotected soils (35-100%) and litter (0-65%). Figure 4 illustrates representative vegetation communities associated with saline lowland 7-9 inch ecological sites in the CCSM Project Site.

When saline lowland 7-9 inch ecological sites are subjected to improper grazing management, species such as greasewood (*Sarcobatus vermiculatus),* halogeton, and annual forbs will increase (NRCS 2011). Indian ricegrass (*Achnatherum hymenoides)*, Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *wyomingensis)*, and Gardner's saltbush (*Atriplex gardneri)* will decrease in frequency and production. Heavy continuous season long grazing will convert this plant community to a Greasewood/Gardner's saltbush vegetation state.

Table 3. Vegetation characteristics typical of saline lowland 7-9 inch ecological sites.

Basal Vegetative Cover (LPI*)	0%–10%	
Biological Soil Crust and Lichen (LPI*)	0%	
Litter Cover (LPI*)	0–65%	
Surface Fragment/Rock Cover (LPI*)	0%	
Unprotected Soil(LPI*)	35%–100%	
Representative Species and Top-Canopy Cover*	Gardener's saltbush	13.6% average (80% CI– 9.7-17.5%)
	Greasewood	6.5% average (80% CI– 2.2-10.8%)
	Wyoming big sagebrush	2.3% average (80% CI– 0.0-4.8%)
	Sandberg bluegrass	1.5% average (80% CI– 0.2-2.8%)
	Slender wheatgrass	1.0% average (80% CI– 0.0-2.3%)

Other Associated Species	Clasping pepperweed Bottlebrush squirreltail Rubber rabbitbrush

* Line point intercept

Figure 4. Characteristic vegetation communities associated with saline lowland 7-9 inch sites in the CCSM Project Site

Reclamation Procedures and Best Management Practices

The reclamation procedures and Best Management Practices (BMPs) outlined in this Ecological Site Reclamation Implementation Plan will be implemented during reclamation of disturbed areas in saline lowland 7-9 inch ecological sites. PCW will implement these ecological site-specific measures in addition to the reclamation procedures and BMPs identified in each site-specific reclamation plan. Reclamation procedures and BMPs account for abiotic landscape features, soil characteristics, and vegetation characteristics and were designed to mitigate impacts to the abiotic and biotic factors characteristic of saline lowland 7-9 inch ecological sites and increase reclamation success. These procedures were developed in accordance with the BLM Wyoming Reclamation Policy (2012), management directives presented in the Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), RFO Reclamation Guidance (BLM 2011), Wyoming Department of Environmental Quality (WDEQ) Land Quality Division

reclamation guidelines (WDEQ 2007), State of Wyoming's reclamation guidance for wind development, and in coordination with BLM staff. This Ecological Site Reclamation Implementation Plan is intended to be adaptive and to take into account changing conditions and technologies. PCW, with concurrence from the BLM AO, may update, modify, or change the procedures contained in this plan if warranted due to site conditions or other factors.

Abiotic Landscape Features

The landscape will be reconstructed to achieve a desired topography, slope stability, and surface stability in accordance with the BLM Wyoming Reclamation Policy (2009) and as detailed in the CCSM Project Master Reclamation Plan (BLM 2012). Site stability will be re-established following landscape reconstruction by maximizing the geomorphic stability and topographic diversity of the reclaimed landscape (BLM 2009). Surface stability will be controlled by maintaining soil physical properties and treating compacted surfaces with accepted technologies.

Reclamation procedures and BMPs to address abiotic landscape features are identified in each site-specific reclamation plan.

Soil Handling

Soil associated with saline lowland 7-9 inch ecological sites will be managed in accordance with the BLM Wyoming Reclamation Policy (2012) and as detailed in the CCSM Project Master Reclamation Plan (2012) and site-specific reclamation plans for surface disturbing activities. Provisions are included below for segregating and marking stockpiles, as well as requirements to protect stockpiled material from erosion, contamination and degradation.

Saline lowland 7-9 inch ecological sites are dominated by salt tolerant plant species. Due to surface leaching and the mitigating effects of soil organic matter, surface soils typically have lower salt concentrations than subsoils; however, salvage and reclamation of saline lowland 7-9 inch ecological sites can often lead to topsoil and subsoil mixing that elevates surface soil concentrations to levels that exceed salt thresholds of most upland plants. Excess cations in salts, though necessary plant nutrients, can impact soil properties, limiting water availability to plants and impeding plant growth.

BMPs and erosion control measures for soil handling within saline lowland 7-9 inch ecological sites are described below. These measures are in addition to the reclamation procedures and BMPs identified in each site-specific reclamation plan.

Soil salvage

- Topsoil will not be salvage for saline lowland 7-9 inch ecological sites
- Saline lowland 7-9 inch ecological sites are characterized by either a woody component or subshrub component comprised of Gardner's saltbush, greasewood and fourwing saltbush and salt-tolerant herbaceous grasses. Where adequate woody species occur,

vegetation will be removed prior to soil salvage efforts. Where woody species are not present or provide little ground cover (not including Gardner's saltbush) vegetation will be stripped with the soil and incorporated into topsoil stockpiles to provide erosion control and biological inocula.

Soil stockpiling

- Subsoil stockpiles will be stored within ecological site. Subsoil will not be transported or used as fill in other ecological sites.
- Subsoils from saline lowland 7-9 inch ecological sites will not be used as a topsoil alternative or mixed with subsoils from other ecological sites and will not be transported for storage off site.
- Stockpiles stored longer than two years will be seeded with the seed mix identified for saline lowland 7-9 inch ecological sites to prevent erosion and contribute organic materials.

Backfill, grading, compaction and contouring

- Disturbed areas will be recontoured to recreate physical characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features to the extent practicable.
- Recontoured surfaces will be stabilized and will have adequate surface roughness to reduce surface run-off.
- Pre-disturbance surface drainage patterns will be re-established to minimize erosion and restore the original hydrologic functions to the extent practicable.
- Due the nature of soils of the saline lowland 7-9 inch ecological sites, compaction can be expected (high clay content) and areas of compacted soil will be disked or harrowed prior to reclamation to reduce soil compaction.

Seed bed preparation

- Topsoil quality and reclamation suitability will be evaluated in areas identified as having limited reclamation potential (Saline soils, Sodic soils, clay soils.) to determine if soil treatments and amendments are necessary.
    - Soil organic matter amendments may be needed to ameliorate the high saline content of soils at these sites. Organic matter in the form of compost effectively dissolves the native calcium carbonate resulting in the replacement of sodium with calcium, improving soil structure and water infiltration and reducing the sodium absorption ratio (SAR). Sources of organic material may include

composted farmyard/feedlot manure, composted municipal yard and tree waste or wood chips from forest fuel reduction activities.

- Gypsum may be used in combination with organic matter in order to more effectively reduce soil pH and EC levels in surface soils. Application rates will be based upon approval by the BLM AO.

- Topsoil quality and reclamation suitability will be evaluated during pre-construction site characterization and or prior to construction in limited reclamation potential areas.
- Soil treatments will be implemented in sensitive soils to improve suitable topsoil conditions, with the concurrence of the BLM AO, as needed. Suitable topsoil criteria and thresholds for specific attributes will be used to identify treatment process, intensity, and frequency (Table 4). The goal of all soil treatments will be to achieve "Good to Fair" topsoil suitability criteria for selected soil attributes and success of treatment will be determined through monitoring vegetation reestablishment and cover, or additional soil testing if necessary.
- Construction activities will be suspended when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting.
- Ponding or gullying is possible in fine textured clayey soils. Reclamation monitoring will inspect for evidence of ponding or gullying. When ponding of gullying is present, appropriate measures will be determined in coordination with the BLM AO.

Exhibit IV:

Saline Upland 7-9 inch Ecological Site

Reclamation Implementation Plan

Site-specific conditions for saline upland 7-9 inch ecological sites in the CCSM Project Site were characterized using data collected at seven monitoring locations (Figure 1, Table 1). Long-term monitoring reference sites for saline upland 7-9 inch ecological sites will be determined in coordination with the BLM Authorized Officer (AO). Any monitoring site that was used for ecological site characterization that is located outside of the CCSM Project limits of disturbance (LODs) may be suitable as a long-term monitoring reference site for saline upland 7-9 inch ecological sites and may be used for future reclamation success monitoring purposes.

Table 1. Representative transects for saline upland 7-9 inch ecological sites in the CCSM Project Site.

	Pre-disturbance characterization sites
Transect numbers	CB_GR_02, CB_SU_06, CB_SU_08, NF_CL_01, NF_GR_01, NF_GR_11, NF_SL_04

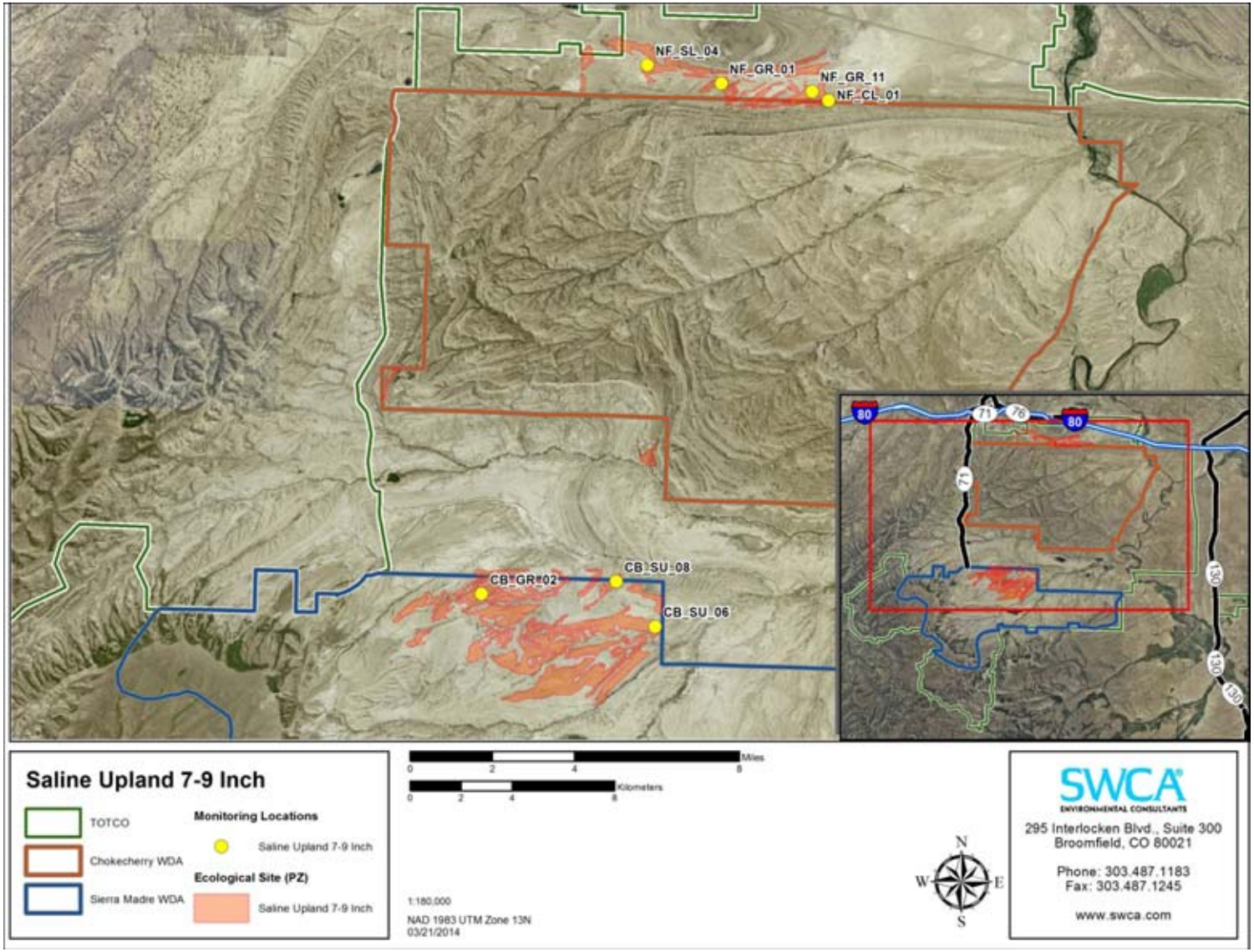

Figure 1. Locations of vegetation transects and soil samples used to characterize saline upland 7-9 inch ecological sites in the CCSM Project Site.

Site Characteristics

Climate

Due to the high elevations and dry air, temperatures at saline upland 7-9 inch sites range significantly between summer and winter and daily maximum and minimums. The average annual air temperature is 41.8° F (25.6°F Avg. Min. to 58.1°F Avg. Max.). Extreme minimum temperatures can occur during the winter months when cold air outbreaks and winter storms move rapidly from northwest to southeast. Daytime winds are stronger than nighttime with some strong gusts associated with the passage of winter storms (NRCS 2011).

Abiotic Landscape Features

Saline upland 7-9 inch ecological sites in the CCSM Project Site can occur on lowland positions or on gently sloping land along streams at all exposures. Slopes vary, but are typically between 1% and 10%.

Soil Characteristics

Saline upland 7-9 inch ecological sites within the CCSM Project Site are characterized by mineral soils with little to no organic material. Topsoil depth averages 8.6 ± 2.2 inches (21.9 ± 5.7 cm). Lower soil horizon depths generally exceed 16 inches (41 cm). The uppermost soil horizon is characterized by sandy loam to clay loam. Subsurface soil textures are characterized by loamy fine sand to clay. Subsurface soils often have increased soluble salt concentrations (NRCS 2011). Sodic horizons, that are typical of this soil type, could form a restrictive layer that impedes air and water movement. Sodicity of the surface soil is likely to cause dispersion of surface aggregates, resulting in surface crusts that inhibit infiltration.

Saline upland 7-9 inch ecological sites in the CCSM Project Site are characterized by soils with slow to moderate infiltration and moderate to high runoff potential. Infiltration rates are highest, and runoff rates lowest where ground cover exceeds 75%. Rills and gullies are typically not present and surface water flow patterns are often indistinguishable (NRCS 2011). Chemical and physical crusts may be present at these sites.

Soils are slightly alkaline to strongly alkaline with pH values between 7.80 and 9.34 and non-saline to slightly saline with electrical conductivities ranging between 0.04 and 1.8 dS/m with salinity increasing with soil depth. Where soil pH ranges exceed 8.4, soils may have limited reclamation potential (LRP) and may need to be evaluated for potential soil treatment (see **Reclamation Procedures and Best Management Practices**). Soils are non-effervescent to strongly effervescent indicating presence of weak and strongly covalent carbonates.

Figures 2 and 3 illustrate the soil surface and soil profile characteristics of a typical saline upland 7-9 inch ecological site in the CCSM Project Site.

Table 2. Soil characteristics typical of saline upland 7-9 inch ecological sites.

Soil Characteristics	Description
Parent Material (Kind)	Alluvium Residuum
Parent Material (Origin)	Sedimentary/Mixed
Soil Depth	8.6 ± 2.2 inches (21.9 ± 5.7 cm)
Surface Texture	Sandy loam to clay loam
Subsurface Texture	Loamy fine sand to clay
Surface Fragments	0-25%, mixed rock, fine to coarse gravel, angular to subangular
Subsurface Fragments	0-75%, sedimentary, fine to coarse gravel, angular to subrounded
Electrical Conductivity	0.04-1.1 dS/m
Salinity Class	Non-saline to slightly saline
Soil Reaction (<20 inches)	7.8 -9.3
pH Class	Slightly alkaline to very strongly alkaline
Carbonate Equivalent (<20 inches)	Non- effervescent to strongly effervescent

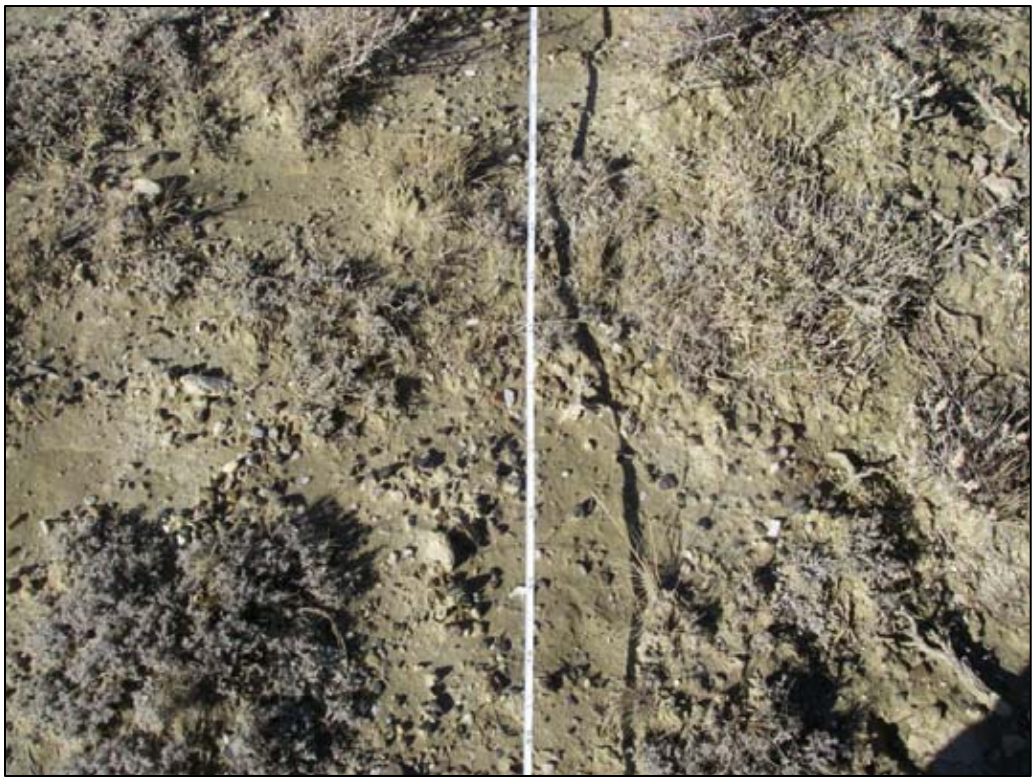

Figure 2. Representative soil surface and ground cover for saline upland 7-9 inch sites in the CCSM Project Site

Figure 3. Representative soil profile for saline upland 7-9 inch sites in the CCSM Project Site.

Vegetation Characteristics

Plant communities associated with saline upland 7-9 inch ecological sites in the CCSM Project Site are characterized by sparsely vegetated surfaces with 0%–5% basal cover (Table 3). The remaining 95-100% of the soil surface is characterized by unprotected soils (25-80%) and litter (10-30%). Figure 4 illustrates representative vegetation communities associated with saline upland 7-9 inch ecological sites in the CCSM Project Site.

When saline upland 7-9 inch ecological sites are subjected to improper grazing management, species such as greasewood (*Sarcobatus vermiculatus),* halogeton and annual forbs will increase (NRCS 2011). Indian ricegrass (*Achnatherum hymenoides)*, Wyoming big sagebrush (*Artemisia tridentata* Nutt. ssp. *wyomingensis)*, and Gardner's saltbush (*Atriplex gardneri)* will decrease in frequency and production. Severe ground disturbance will convert this plant community to a halogeton state. Heavy continuous season long grazing will convert this plant community to a Gardner's saltbush/annual forb vegetation state.

Table 3. Vegetation characteristics typical of saline upland 7-9 inch ecological sites.

Basal Vegetative Cover (LPI*)	0%–5%	
Biological Soil Crust and Lichen (LPI*)	0%-5%	
Litter Cover (LPI*)	10%-30%	
Surface Fragment/Rock Cover (LPI*)	0%-25%	
Unprotected Soil(LPI*)	25%–80%	
Representative Species and Top-Canopy Cover*	Gardener's saltbush	6.7% average (80% CI– 2.6-10.9%)
	Birdfoot sagebrush	4.0% average (80% CI– 0.8-4.6%)
	Alkali sacaton	2.3% average (80% CI– 0.0-5.2%)
	James' galleta	1.9% average (80% CI– 0.0-4.2%)
	Bud sagebrush	1.7% average (80% CI– 0.0-3.9%)

Other Associated Species	Shadscale
	Woody aster
	Threadleaf sedge
	Indian ricegrass
	Western wheatgrass

* Line point intercept

Figure 4. Characteristic vegetation communities associated with saline upland 7-9 inch sites in the CCSM Project Site

Reclamation Procedures and Best Management Practices

The reclamation procedures and Best Management Practices (BMPs) outlined in this Ecological Site Reclamation Implementation Plan will be implemented during reclamation of disturbed areas in saline upland 7-9 inch ecological sites. PCW will implement these ecological site-specific measures in addition to the reclamation procedures and BMPs identified in each site-specific reclamation plan. Reclamation procedures and BMPs account for abiotic landscape features, soil characteristics, and vegetation characteristics and were designed to mitigate impacts to the abiotic and biotic factors characteristic of saline upland 7-9 inch ecological sites and increase reclamation success. These procedures were developed in accordance with the BLM

Wyoming Reclamation Policy (2012), management directives presented in the Rawlins Field Office (RFO) Resource Management Plan (RMP) (BLM 2008), RFO Reclamation Guidance (BLM 2011), Wyoming Department of Environmental Quality (WDEQ) Land Quality Division reclamation guidelines (WDEQ 2007), State of Wyoming's reclamation guidance for wind development, and in coordination with BLM staff. This Ecological Site Reclamation Implementation Plan is intended to be adaptive and to take into account changing conditions and technologies. PCW, with concurrence from the BLM AO, may update, modify, or change the procedures contained in this plan if warranted due to site conditions or other factors.

Abiotic Landscape Features

The landscape will be reconstructed to achieve a desired topography, slope stability, and surface stability in accordance with the BLM Wyoming Reclamation Policy (2009) and as detailed in the CCSM Project Master Reclamation Plan (BLM 2012). Site stability will be re-established following landscape reconstruction by maximizing the geomorphic stability and topographic diversity of the reclaimed landscape (BLM 2009). Surface stability will be controlled by maintaining soil physical properties and treating compacted surfaces with accepted technologies.

Reclamation procedures and BMPs to address abiotic landscape features are identified in each site-specific reclamation plan.

Soil Handling

Soil associated with saline upland 7-9 inch ecological sites will be managed in accordance with the BLM Wyoming Reclamation Policy (2012) and as detailed in the CCSM Project Master Reclamation Plan (2012) and site-specific reclamation plans for surface disturbing activities. Provisions are included below for segregating and marking stockpiles, as well as requirements to protect stockpiled material from erosion, contamination and degradation.

Saline ecological sites are dominated by salt tolerant plant species. Due to surface leaching and the mitigating effects of soil organic matter, surface soils typically have lower salt concentrations than subsoils; however, salvage and reclamation of saline upland 7-9 inch ecological sites can often lead to topsoil and subsoil mixing that elevates surface soil concentrations to levels that exceed salt thresholds of most upland plants. Excess cations in salts, though necessary plant nutrients, can impact soil properties, limiting water availability to plants and impeding plant growth.

BMPs and erosion control measures for soil handling within saline upland 7-9 inch ecological sites are described below. These measures are in addition to the reclamation procedures and BMPs identified in each site-specific reclamation plan.

Soil salvage

- Topsoil averages is approximately 8.6 ± 2.2 inches (21.9 ± 5.7 cm)in depth on saline upland 7-9 inch sites in the CCSM Project Site. Topsoil therefore will be excavated to a

depth no greater than 10.8 inches (10.8 cm) based on the site-specific soil depths encountered (Table 2).

- Saline upland 7-9 inch ecological sites are characterized by either a woody component or subshrub component comprised of black greasewood and or Gardner's saltbush and salt-tolerant herbaceous grasses. Where adequate woody species occur, vegetation will be removed prior to soil salvage efforts. Where woody species are not present or provide little ground cover (not including Gardner's saltbush) vegetation will be stripped with the soil and incorporated into topsoil stockpiles to provide erosion control and biological inocula.

Soil stockpiling

- Topsoil taken from areas of saline upland 7-9 inch ecological sites will be segregated and stockpiled separately from soils taken from other ecological sites.
- Subsoils from saline upland 7-9 inch ecological sites will not be used as a topsoil alternative or mixed with subsoils from other ecological sites and will not be transported for storage off site.
- Stockpiles stored longer than two years will be seeded with the seed mix identified for saline upland 7-9 inch ecological sites to prevent erosion and contribute organic materials.

Backfill, grading, compaction and contouring

- Disturbed areas will be recontoured to recreate physical characteristics that approximate the visual quality of adjacent areas with regard to location, scale, contour, color, and orientation of major landscape features to the extent practicable.
- Recontoured surfaces will be stabilized and will have adequate surface roughness to reduce surface run-off.
- Pre-disturbance surface drainage patterns will be re-established to minimize erosion and restore the original hydrologic functions to the extent practicable.
- Due the nature of soils of the saline upland 7-9 inch ecological sites, compaction can be expected (high clay content) and areas of compacted soil will be disked or harrowed prior to reclamation to reduce soil compaction.

Seed bed preparation

- Topsoil quality and reclamation suitability will be evaluated in areas identified as having limited reclamation potential (Saline soils, Sodic soils, clay soils.) to determine if soil treatments and amendments are necessary.

  - Soil organic matter amendments may be needed to ameliorate the high saline content of soils at these sites. Organic matter in the form of compost effectively dissolves the native calcium carbonate resulting in the replacement of sodium with calcium, improving soil structure and water infiltration and reducing the sodium absorption ratio (SAR). Sources of organic material may include composted farmyard/feedlot manure, composted municipal yard and tree waste or wood chips from forest fuel reduction activities.
  - Gypsum may be used in combination with organic matter in order to more effectively reduce soil pH and EC levels in surface soils. Application rates will be based upon approval by the BLM AO.

- Topsoil quality and reclamation suitability will be evaluated during pre-construction site characterization and or prior to construction in limited reclamation potential areas.
- Soil treatments will be implemented in sensitive soils to improve suitable topsoil conditions, with the concurrence of the BLM AO, as needed. Suitable topsoil criteria and thresholds for specific attributes will be used to identify treatment process, intensity, and frequency (Table 4). The goal of all soil treatments will be to achieve "Good to Fair" topsoil suitability criteria for selected soil attributes and success of treatment will be determined through monitoring vegetation reestablishment and cover, or additional soil testing if necessary.
- Construction activities will be suspended when soils are too wet to support construction equipment without significant rutting. In general, activities that cause in excess of four inches of rutting will be halted, unless such rutting occurs in subsoils that will be cut or filled beyond the extent of the rutting.
- Ponding or gullying is possible in fine textured clayey soils. Reclamation monitoring will inspect for evidence of ponding or gullying. When ponding of gullying is present, appropriate measures will be determined in coordination with the BLM AO.

Table 4. Criteria to Establish Suitable Topsoil (or Topsoil Substitutes)[1].

Parameter	Suitability			Unsuitable
	Good	Fair	Poor	
pH	6.4–8.0	6.0–6.4 8.0–8.4	5.0–6.0 8.4–9.0	<5.0 >9.0
EC (conductivity)[2] mmhos/cm	0–4	4–8	8–16	>16
Saturation Percentage	25–80		>80 <25	--
Texture[3]	SL, L, SIL, SCL, VFSL, FSL	CL, SICL, SC, LS, LFS	C, SIC, S	--
SAR	<6	6–10	10–15 10–12[4]	>15 >12[4]
Selenium	<2.0 ppm			>2.0 ppm
Boron	<5.0 ppm			>5.0 ppm
Calcium Carbonate	0–15%	15–30%	>30%	--
Coarse Fragments (% volume)				
3–10 inches	0–15	15–25	25–35	>35
>10 inches	0–3	3–7	7–10	>10
Consistency[5]				
Moist	VFR, FR	LO, FI	VFI, EXFI	--
Dry	LO, SO	SH, H	VH	

1 Topsoil suitability criteria adapted from Rawlins Field Office Reclamation Guidance (BLM 2011) and Wyoming Department of Environmental Quality Land Quality Division (1994, 2007)

2 EC (conductivity) of >8 may prove difficult for revegetation.

3 Soil texture (Schoeneberger et al. 2009):

C	=	Clay	SC	=	Sandy clay
CL	=	Clay loam	SCL	=	Sandy clay loam
FSL	=	Fine sandy loam	SIC	=	Silty clay
L	=	Loam	SICL	=	Silty clay loam
LFS	=	Loamy fine sand	SIL	=	Silt loam
LS	=	Loamy sand	SL	=	Sandy loam
S	=	Sand	VFSL	=	Very fine sandy loam

4 For fine-textured soils (clay >40%) (Gee et al. 1978).

5 Consistency (Schoeneberger et al. 2009):

EXFI	=	Extremely firm	SH	=	Semi-hard
FI	=	Firm	SO	=	Soft
FR	=	Friable	VFI	=	Very firm
H	=	Hard	VFR	=	Very friable
LO	=	Loose	VH	=	Very hard

Vegetation Handling

The primary objective of revegetation is to establish the species composition, diversity, structure, and total ground cover appropriate for the desired plant community (BLM 2012). In accordance with BLM Wyoming Reclamation Policy (2012), proper seeding mixtures will be used to reclaim disturbed areas on federal lands with native vegetation, as detailed in the CCSM Project Master Reclamation Plan (2012). Soil conditioning, de-compaction, and topsoil protection measures will be implemented to reestablish topsoil properties and to protect the seeding surface, as described in the CCSM Project Master Reclamation Plan (BLM 2012), site-specific reclamation plans, and in compliance with BLM Wyoming Reclamation Policy (2012).

Seed mixtures will be tailored to establish species diversity, composition, and ground cover appropriate for the desired plant community that has been documented for saline upland 7-9 inch ecological sites in the CCSM Project Site.

Seed mixtures may be refined based on soil management, wildlife, or rangeland needs. The seed pick list for saline upland 7-9 inch ecological sites was developed based on the RFO ecological site specific pick lists combined with site-specific vegetation data and composition (Table 5) (BLM 2008, 2011). The use of non-native species on federal lands will only be considered as the result of the documented failure to revegetate any area with native species and will be implemented in coordination with the BLM AO.

Recommended BMPs and protective measures for successfully reestablishing site vegetation are described below.

BMPs and protective measures for successfully reestablishing site vegetation are described below.

- Seeding rates for the saline upland 7-9 inch ecological sites will be calculated using the NRCS worksheet available on the Wyoming Reclamation and Restoration Center Web site (http://uwyo.edu/WRRC) or other appropriate tool.
- Proper timing will be established for each specific seed mix. Dormant seeding after October 15 before the ground freezes or before April 15 is anticipated to be most effective. Alternate timing for seeding activities may be appropriate and will be used if necessary with concurrence from the BLM AO.
- Vegetation establishment and cover will be used as a baseline to determine if soil amendments are needed (Table 4). If necessary, the topsoil will be tested to identify appropriate amendments prior to site preparation (see *Section Seed Bed Preparation*) and or seeding.
- In the event that highly sodic soils are too difficult to remediate, adapted plant species may be selected instead of soil management.

- After seeding, furrows or pits will be created to roughen the soil surface, increase moisture infiltration, capture blowing snow, and slow the surface velocity of wind and water to reduce erosion and sedimentation.
- Saline upland 7-9 inch ecological sites have relatively low productivity potential and can be sensitive to year-round grazing activities. As practicable, livestock will be excluded from reclaimed areas until appropriate levels of site stabilization and revegetation are achieved.

Table 5. Recommended seed pick list for saline upland ecological sites.

Name	***Scientific Name***	**Variety**
Grasses		
Indian ricegrass	*Achnatherum hymenoides*	Rimrock (Nez Par)
Alkali sacaton	*Sporobolus airoides*	
Inland saltgrass	*Distichlis spicata*	
Little bluegrass "Sandberg"	*Poa Secunda*	High Plains
Western wheatgrass	*Pascopyrum smithii*	Rosana
Basin wildrye	*Leymus cinereus*	Trailhead, Magnar
Shrubs		
Fourwing saltbush	*Atriplex canescens*	Wytana
Shadscale	*Atriplex confertifolia*	
Gardner's saltbush	*Atriplex gardneri*	
Greasewood	*Sarcobatus vermiculatus*	
Forbs		
Textile onion	*Allium textile*	
Desert biscuitroot	*Lomatium foeniculaceum*	
Hoods phlox	*Phlox hoodii*	

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APPENDIX M

Chokecherry and Sierra Madre Wind Energy Project
Avian Resource Report

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately nine miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Wildlife Monitoring and Protection Plan for the CCSM Project that identifies measures to be completed for each site-specific plan of development, including a discussion of avian and bat inventory and monitoring requirements (BLM 2012: Appendix G). Inventory and monitoring for avian species, including eagles and migratory birds, will be conducted in accordance with the CCSM Project Bird and Bat Conservation Strategy (BBCS) and Eagle Conservation Plan (ECP). A discussion of the inventory completed to date, as it relates to the West Sinclair Rail Facility (Rail Facility), is included in this Avian Resource Report. The Rail Facility (Figure 1) is an integral part of the CCSM Project that connects the CCSM

Project to the existing Union Pacific Railroad. The Rail Facility is located south of Interstate 80 along the northern boundary of the CCSM Project Site.

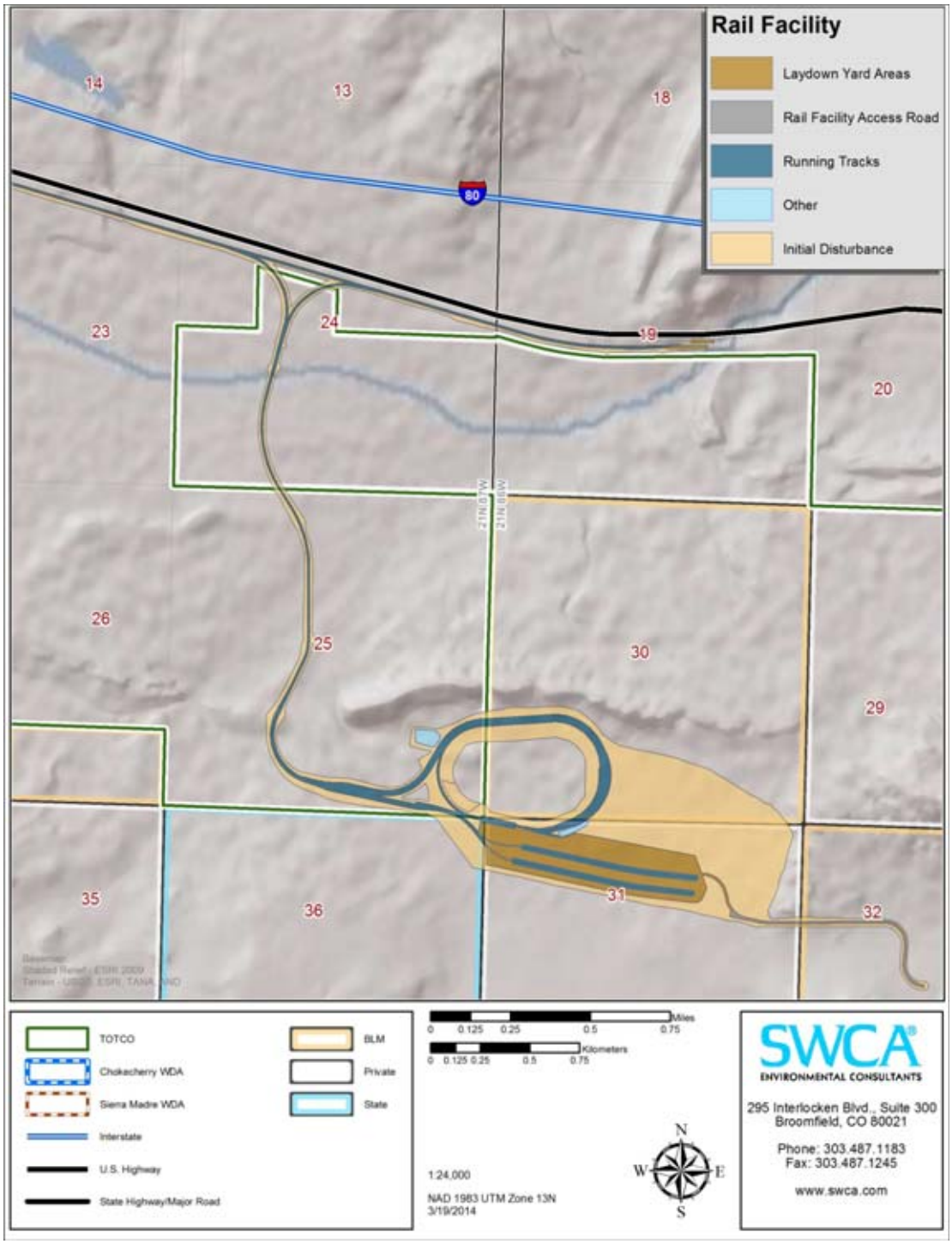

Figure 1. Rail Facility Overview

2.0 BACKGROUND AND METHODS

SWCA Environmental Consultants (SWCA) has been collecting avian species occurrence and habitat data for the CCSM Project since 2009. A combination of avian radar data collection, raptor long-watch surveys, Rocky Mountain Bird Observatory grid sampling surveys, 20-minute point count surveys, waterbird use surveys, and aerial nest surveys have been completed across the CCSM Project Site. Generally, the avian surveys that have been completed include:

- Long-watch raptor surveys at more than 80 locations across all habitat types in the CCSM Project Site;
- Migratory bird point count surveys at 19 locations in 2008-2009 and 15 locations in 2011-2012;
- Aerial raptor nest surveys across 700,000 acres within 5 miles of the CCSM Project site;
- Breeding bird grid sampling at 16 locations and all representative habitat types across the CCSM Project Site;
- Seasonal water bird use surveys at four reservoirs in the CCSM Project Site; and
- Avian radar data collected continuously between April 2011 and April 2013 at six locations throughout the CCSM Project Site.

These data are suitable to identify the species and use associated with the habitats in the Rail Facility. Additionally, SWCA biologists conducted wildlife surveys within all planned disturbance areas associated with the Rail Facility as well as a 100 foot buffer surrounding all planned disturbances (Figure 1).

2.1 BLM SENSITIVE SPECIES

2.1.1 Mountain Plover

The mountain plover was recently considered for federal listing under the ESA; however, as of May 12, 2011 the proposed listing was withdrawn as the USFWS concluded that the species is not endangered or threatened throughout all or a significant portion of its range. The mountain plover is still a BLM sensitive species. The mountain plover is considered a summer resident in Wyoming; its population status and trend are unknown, but suspected to be stable. Mountain plovers inhabit open landscapes and nest in large, flat grassland expanses with sparse short vegetation

Mountain plover habitat was assessed for the CCSM Project (BLM 2012a). Suitable habitat monitored for the presence of plovers and additional habitat surveys were conducted as necessary for the Rail Facility Site.

2.1.2 Greater sage-grouse

PCW has been conducting greater sage-grouse population monitoring within the CCSM Project Site and surrounding areas since spring 2010. Surveys completed as part of the sage-grouse monitoring program from 2010-2012 include outfitting 50 female sage-grouse with GPS Platform Terminal Transmitters, lek counts, nest monitoring, and brood surveys. The study design for sage-grouse monitoring follows a before-after control-impact design (Smith 2002). This allows for a stronger inference regarding the success of proposed conservation measures, particularly due to those measures that seek to reduce sage-grouse mortality and improve productivity by enhancing nesting and brood-rearing habitat. A discussion of the proposed conservation measures and a detailed sage-grouse monitoring report are included as part of the Sage-grouse Conservation Plan in the CCSM Project Plan of Development published with the CCSM ROD (BLM 2012b).

2.1.3 Sagebrush Obligates

BLM-sensitive sagebrush obligates include sage thrasher (Oreoscoptes montanus), sagebrush sparrow (Artemisiospiza nevadensis, formerly sage sparrow), and Brewer's sparrow (Spizella breweri). Sagebrush obligates were recorded during wildlife surveys when observed. All observations were recorded as point features with a GPS device and their environmental setting was described.

2.1.4 Western Burrowing Owl

Burrowing owls are considered uncommon summer residents in Wyoming and utilize a wide variety of arid and semiarid environments characterized by sparse vegetation and bare ground (Wyoming Game and Fish Department [WGFD] 2005). Burrowing owls are dependent upon burrowing mammals, such as prairie dogs and ground squirrels, for nesting, roosting, and escape cover and their abundance and distribution is determined by the presence of these species.

White-tailed prairie dog colonies with open burrows and other potential habitat were assessed during Rail Facility surveys. Areas of potentially suitable habitat were surveyed for the presence of burrowing owls in the Rail Facility Site.

2.2 RAPTORS

PCW has collected detailed data on raptor use of the CCSM Project Site through point count surveys and other monitoring protocols. Detailed information on point count survey methods and results can be found in the BBCS and ECP for the CCSM Project.

2.3 OTHER MIGRATORY AND BREEDING BIRDS

Migratory bird point count surveys and breeding bird grid sampling were used to characterize avian use in representative habitat types across the CCSM Project Site, as discussed above. Detailed information can be found in the BBCS for the CCSM Project.

3.0 RESULTS AND DISCUSSION

Habitats in the Rail Facility Site are used by a number of avian species. Data collection efforts across the CCSM Project Site and wildlife surveys of the Rail Facility helped identify the species most likely to occur in the Rail Facility Site. Habitats in the area are dominated by salt desert shrub and sagebrush communities, with areas of barren or sparsely vegetated habitats associated with more saline habitats near Sugar Creek in the northern portion of the Rail Facility.

3.1 BLM SENSITIVE SPECIES

3.1.1 Mountain Plover

Potential mountain plover habitat is present in the Rail Facility Site. Mountain plover habitat in the western periphery of its range, which includes the Rail Facility, is primarily xeric, shrubland (e.g., saltbush *Atriplex* spp. and sagebrush *Artemisia* spp.) communities with extensive bare ground (Smith and Keinath 2004). Suitable habitat was mapped (Figures 2 and 3) using site-specific vegetation data and incidental observations that were made during survey efforts. Suitable habitat was defined as bird's foot sagebrush communities, Gardner's saltbush communities, shadscale saltbush communities, and upland grass communities with extensive bare ground and relatively low herbaceous height. .This suitable habitat map closely matches the modeled habitat presented in the BLM's FEIS for the CCSM Project (BLM 2012).

3.1.2 Greater Sage-grouse

No greater sage-grouse occurrences have been recorded in the Rail Facility or vicinity. Habitat conditions in the area are marginal for greater sage-grouse use, and it is unlikely that greater sage-grouse occupy habitats in the Rail Facility Site.

3.1.3 Western Burrowing Owl

Potential burrowing owl habitat is present in the Rail Facility Site. Biological surveys in 2012 and 2013 found no burrowing owl activity in the Rail Facility survey area; however, several areas within the survey area do contain active and historic white-tailed prairie dog burrows that could provide habitat for burrowing owls.

3.1.4 Sagebrush Obligates

The only sagebrush obligate species observed during wildlife surveys of the Rail Facility was one adult sage thrasher (*Oreoscoptes montanus*) in a small patch of sagebrush. While suitable habitat for sagebrush obligates occurs in the Rail Facility survey area it is generally distributed in small patches and does not provide contiguous habitat conditions that would be ideal for nesting or foraging activities.

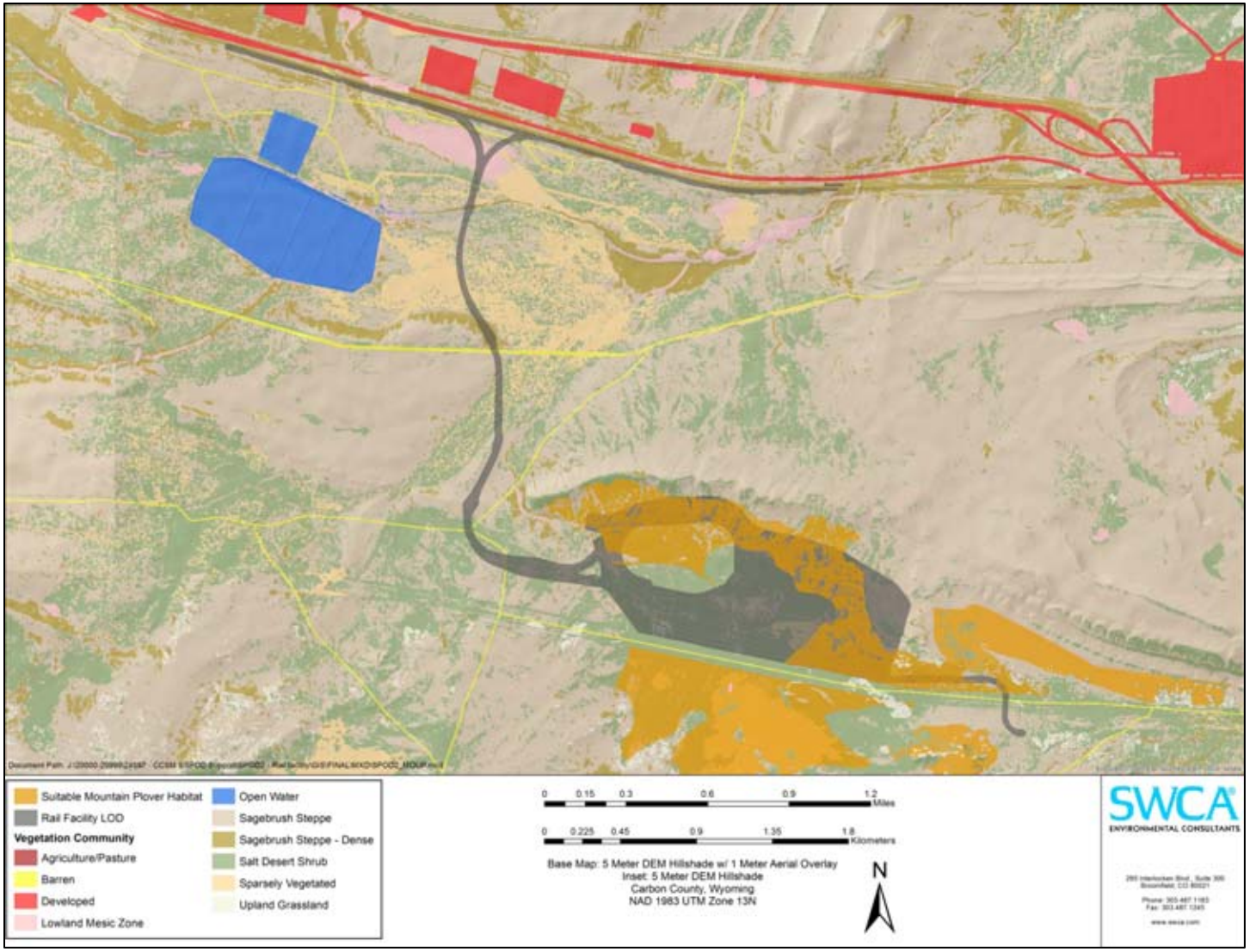

Figure 2. Suitable Mountain Plover Habitat in the Rail Facility Site.

3.2 RAPTORS

No raptor nests have been found in the Rail Facility Site. The lack of trees, sparse herbaceous and shrub vegetation, and relatively flat topography suggest that the Rail Facility Site has a very low potential for nesting raptor species; although general use (e.g., hunting) may occur.

3.3 OTHER MIGRATORY AND BREEDING BIRDS

Based on survey data collected in similar habitats throughout the CCSM Project Site, horned lark (*Eremophila alpestris*), Brewer's sparrow (*Spizella breweri*), and vesper sparrow (*Pooecetes gramineus*) are likely the most abundant breeding and migratory birds in the area. These three species were the most commonly recorded species in the sagebrush and salt desert shrub habitats in other areas of the CCSM Project site and have been observed in the general vicinity of the Rail Facility.

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APPENDIX N

Chokecherry and Sierra Madre Wind Energy Project
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Table 1. Habitat preferences of northern pocket gopher, Wyoming pocket gopher, and unoccupied habitat. 9

1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Wildlife Monitoring and Protection Plan for the CCSM Project that identifies measures to be completed for each site-specific plan of development, including wildlife field reviews (BLM 2012: Appendix G). Field reviews are intended to reduce impacts by identifying specific locations where impacts might occur and providing opportunities to avoid, minimize, or mitigate impacts.

In accordance with the Wildlife Monitoring and Protection Plan, SWCA Environmental Consultants (SWCA) conducted wildlife surveys for the West Sinclair Rail Facility of the

CCSM Project (Rail Facility) in 2012 and 2013. Wildlife surveys focused on the potential occurrence of BLM sensitive species and habitat assessments for species identified in the Wildlife Monitoring and Protection Plan. SWCA biologists conducted surveys within all planned disturbance areas associated with the Rail Facility as well as a 100 foot buffer surrounding all planned disturbances.

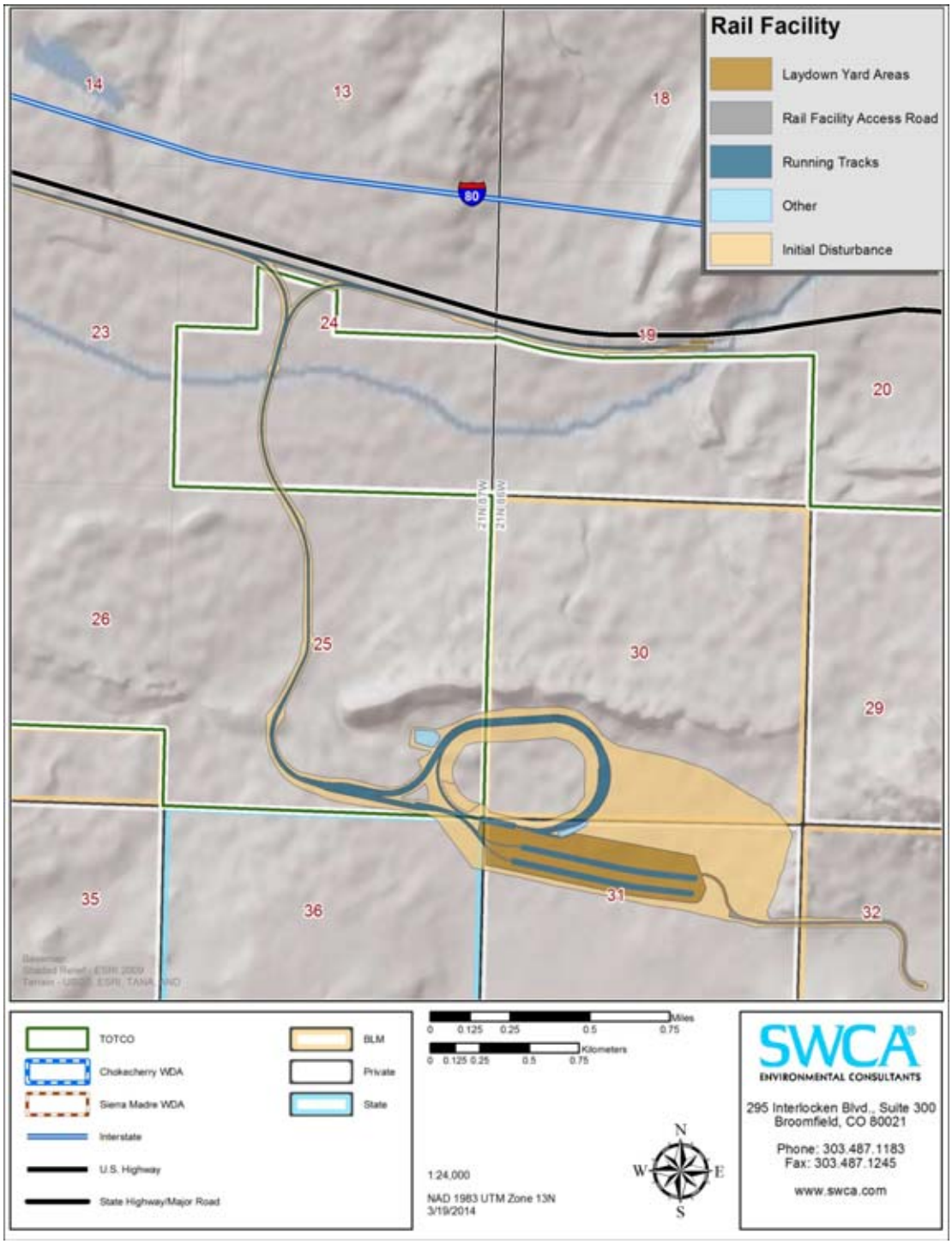

Figure 1. Rail Facility Overview.

2.0 BACKGROUND AND METHODS

Wildlife field review protocols have been identified for wildlife species (BLM 2012b). The goal of monitoring efforts is to develop mitigation strategies to avoid and or minimize adverse impacts to wildlife present on the CCSM Project Site. Wildlife field reviews were completed for special status species (SSS), including threatened, endangered, candidate, and BLM sensitive species. Field reviews for SSS include:

- Raptor, other avian species, and bats
- White-tailed prairie dogs (*Cynomys leucurus*)
- Pygmy rabbit (*Brachylagus idahoensis*)
- Wyoming pocket gopher (*Thomomys clusius*)
- Mountain plover (*Charadrius montanus*)
- Greater sage-grouse (*Centrocercus urophasianus*)
- Western burrowing owl (*Athene cunicularia hypugaea)*
- Sagebrush obligate avian species
- Amphibians
- Reptiles
- Fish

The wildlife species for which specific field reviews were conducted for the Rail Facility were developed based on management agency input and public concern identified during the National Environmental Policy Act (NEPA) review process (BLM 2012a; 2012b). These species may occur within the CCSM Project Site as a result of the presence of potentially suitable habitat.

SWCA biologists conducted surveys within all planned disturbance areas associated with the Rail Facility as well as a 100 foot buffer surrounding all planned disturbances. All avian SSS are addressed in the "Avian Resource Report" for the West Sinclair Rail Facility.

2.1 RAPTORS, OTHER AVIAN SPECIES, AND BATS

PCW has collected detailed data on avian and bat use of the CCSM Project Site through diurnal point count surveys and other monitoring protocols. The results of the avian surveys as they relate to the Rail Facility are included in the "Avian Resource Report" for the West Sinclair Rail Facility.

2.2 WHITE-TAILED PRAIRIE DOG

The state of Wyoming contains approximately 71% of the current national range of white-tailed prairie dog, a fossorial (burrowing) mammal that typically inhabits shrub-steppe and grassland assemblages in cool intermountain basins (Keinath 2004). Prairie dogs are known to provide habitat and forage for many other wildlife species including other BLM sensitive

species, such as mountain plover (*Charadrius montanus*), western burrowing owl (*Athene cunicularia hypugaea*), swift fox (*Vulpes velox*), golden eagle, ferruginous hawk (Buteo regalis), and black-footed ferret (*Mustela nigripes*). The white-tailed prairie dog is a large ground squirrel (Family Sciuridae) that ranges in length between 33-38 cm (13-15 in) and generally weighs 0.8-1.5 kg (1.8-3.3 lbs.). Habitat includes mid-elevation (approximately 1,150-3,050 meters above mean sea level) grasslands and shrublands with moderate slope (less than 20%). White-tailed prairie dogs inhabit higher elevation grasslands and shrub-steppe with more abundant shrub cover than its close relative, the black-tailed prairie dog (*C. ludovicianus*) (Campbell and Clark 1981). White-tailed prairie dogs are colonial, forming "towns" averaging 3.2 prairie dogs per hectare (Clark 1973). Unlike black-tailed prairie dogs that form tight colonies with clearly defined boundaries, white tailed prairie dogs form diffuse colonies of burrows comprised of amorphous fingers and clusters (Seglund et al. 2004).

White-tailed prairie dogs have experienced population declines in recent years and current occupancy estimates are commonly inflated because occupancy is generally based on historic data and pre-plague burrow distributions that are not indicative of current occupation (Keinath 2004, Seglund et. al 2004, Pauli et. al 2006). In 2010, the U.S. Fish and Wildlife Service (USFWS) determined that the white-tailed prairie dog does not warrant protection as a threatened or endangered species under the Endangered Species Act (ESA) of 1973 because its overall distribution has not substantially changed and large acreages of occupied habitat exist across its range, particularly in Wyoming (USFWS 2010). In Wyoming, however, the white-tailed prairie dog remains listed as a sensitive species by the BLM.

Much of south-central Wyoming contains overlapping populations of several common fossorial mammal species which may potentially create challenges when attempting to delineate white-tailed prairie dog towns. Other burrowing mammals that create burrows similar to white-tailed prairie dogs include Wyoming ground squirrel (*Urocitellus elegans*), American badger (*Taxidea taxus*), and pocket gophers (*Thomomys* spp.).

Numerous mapping and survey efforts have occurred in the vicinity of the CCSM Project Site (Western EcoSystems Technologies, Inc. [WEST] 2008, Smith Environmental and Engineering [SMITH] 2010, SWCA 2012) and white-tailed prairie dog occurrences have been documented. In 2012, SWCA conducted white-tailed prairie dog surveys throughout the CCSM Project Site and documented burrow density and activity within colonies. Survey protocols were consistent with McDonald et al. (2011) and Biggins et al. (1993). Survey data from the 2012 white-tailed prairie dog surveys (SWCA 2012) were used to assess white-tailed prairie dog occurrence and activity within the Rail Facility survey area. Additional opportunistic observations for white-tailed prairie dog and active colonies were recorded in areas of potential habitat in the Rail Facility survey area.

2.3 PYGMY RABBIT

The pygmy rabbit is the smallest North American rabbit, with adult weights ranging from 0.54 to 1.20 pounds (245–544 grams) and lengths ranging from 9.1 to 12.1 inches (23.1–30.7 centimeters [cm]). The species can be distinguished from other rabbits by its small size, gray

color, short rounded ears, small hind legs, and the absence of white on the tail (U.S. Fish and Wildlife Service [USFWS] 2005). Pygmy rabbits typically occur in areas of tall, dense big sagebrush (*Artemisia* spp.) cover growing on deep, loamy soils. The rabbits are highly dependent on sagebrush to provide both food and shelter throughout the year. The winter diet of pygmy rabbits is comprised of up to 99% sagebrush, which is unique among rabbits.

Pygmy rabbit burrows are typically found in relatively deep, loose soils of wind-borne or water-borne (e.g., alluvial fan) origin. The burrows frequently have multiple entrances, some of which are concealed at the base of larger sagebrush plants. Burrows are relatively simple and shallow, often no more than 6.6 feet (2.0 meters) in length and usually less than 3.3 feet (1.0 meter) deep with no distinct chambers. Burrows are typically dug into gentle slopes or mound/inter-mound areas of more level or dissected topography. In general, the number of active burrows in a colony increases over the summer as the number of juveniles increases. However, the number of active burrows may not be directly related to the number of individuals in a given area because some individual pygmy rabbits appear to maintain multiple burrows, while some individual burrows are used by multiple individuals (USFWS 2005).

Pygmy rabbits occasionally make use of burrows abandoned by other species, such as the badger (*Taxida taxus*). As a result, they may occur in areas of shallower or more compact soils that support sufficient shrub cover. Natural cavities (such as holes in volcanic rock), rock piles, stone walls, and areas around abandoned buildings may also be used. During winter months, pygmy rabbits make extensive use of snow burrows as travel corridors among their underground burrows, for protection from predators, use as thermal cover, and/or access to sagebrush forage (USFWS 2005).

The pygmy rabbit's current geographic range, excluding the Columbia Basin Distinct Population Segment, includes most of the Great Basin and some of the adjacent intermountain areas of the western United States, including southwestern Wyoming. The pygmy rabbit is thought to have a patchy distribution across its range associated with tall, dense stands of big sagebrush where soils are sufficiently deep and loose to allow burrowing (Keinath and McGee 2004). However, pygmy rabbit use has been recorded in low sagebrush habitats as well (BLM 2012a).

A predictive model prepared by the Wyoming Natural Diversity Database (WYNDD) indicates possible occurrence of potential habitat throughout the CCSM Project Site (BLM 2012a). Potential impacts to pygmy rabbits include 1) direct loss of habitat; 2) indirect loss of habitat, including displacement due to increased traffic on roads and human activity; and 3) inadvertent mortalities due to increased traffic on roads and human activity (BLM 2012a).

Pygmy rabbit surveys were completed between September and November 2012 and in May 2013. Survey protocols were consistent with Ulmschneider (2004). Survey routes were adjusted to investigate areas that appeared to provide potential pygmy rabbit habitat. Protocols required that each identified pygmy rabbit burrow system (not individual openings), pygmy rabbit sighting, or pygmy rabbit pellet pile be recorded as a point feature with a global

positioning system (GPS) and that photographs be taken of the diagnostic evidence used to identify pygmy rabbit use.

2.4 WYOMING POCKET GOPHER

Pocket gophers are small, vole-like mammals that are adapted to fossorial living (i.e., subterranean), with small ears, small eyes, fur-lined cheek pouches used to carry food, and very strong front limbs with long nails used for digging. There are several species of pocket gophers in the western United States that look very similar, making it difficult to identify species. The Wyoming pocket gopher is smaller and paler than other pocket gophers, with a distinctive yellow cast to its fur (Beauvais and Dark-Smiley 2005). The known range of Wyoming pocket gopher is south-central Wyoming, almost entirely south of Interstate 80 in Carbon and Sweetwater Counties; however, it is possible populations may extend into northern Colorado (Beauvais and Dark-Smiley 2005).

Characterization of habitat components for Wyoming pocket gopher continues to be refined. In the past, Wyoming pocket gopher habitat has been described as well-drained, gravelly soiled ridge tops and edges of deeply eroded washes, as well as a stronger association with greasewood (*Sarcobatus vermiculatus*) than sagebrush habitats (Clark and Stromberg 1987; Beauvais and Dark-Smiley 2005). Trapping efforts in 2008 found the presence of Wyoming pocket gophers away from ridge tops, although all sites appear to be at least moderately sloped (Keinath and Griscom 2008, 2009). The 2008 capture site data further suggest that soil type may be of limited importance, except that the species is rarely found in soils that are greater than 60% clay (Keinath and Griscom 2009). Low-statured shrubs and forbs apparently dominate the vegetative component of known Wyoming pocket gopher sites, while sagebrush abundance is often limited. The 2008 trapping efforts did not find Wyoming pocket gophers in areas of moderate to high dominance of Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), sand dunes, or in such low-lying areas as valley bottoms and flats dominated by greasewood. Additional trapping in 2009 found that the Wyoming pocket gopher occurs on sites with 50% to 80% bare ground, little to no grass or littercover, where Gardner's saltbush and winterfat (*Krascheninnikovia lanata*) are present and big sagebrush is absent or subdominant (Griscom et al. 2010). Significant habitat differences exist between unoccupied habitat, Wyoming pocket gopher habitat, and northern pocket gopher habitat (*Thomomys talpoides*) (Table 1).

Burrow systems associated with Wyoming pocket gophers range from approximately 6 to 12 inches (15 to 30 cm) below the surface, typically consisting of a network of feeding tunnels connected to a smaller and deeper system of chambers that are used for nesting and food storage (Beauvais and Dark-Smiley 2005). Although pocket gopher activity is easy to identify in the field by locating mounds, it is difficult to know which species occupies a particular site; however, tunnel diameter has been used as an indicator to distinguish Wyoming pocket gopher from other species (Griscom and Keinath 2010). Tunnel diameter in combination with percent bare ground and Gardner's saltbush (*Atriplex gardneri*) cover has higher predictive capability (Griscom and Keinath 2010).

Potential habitat for Wyoming pocket gophers has been modeled within the CCSM Project Site (Keinath and Griscom 2008; WYNDD 2010a). The potential impacts to Wyoming pocket gopher from the CCSM Project include 1) direct loss of habitat; 2) indirect loss of habitat; and 3) increased traffic on roads and human activity resulting in Wyoming pocket gopher fatalities (BLM 2012a).

Pocket gopher mound surveys were completed between September and November 2012 and in May 2013, and followed WYNDD protocols (WYNDD 2010b). Pocket gopher mounds and/or complexes were recorded when fresh mounds were located. Pocket gophers create mounds by pushing soil out from their tunnel systems. These mounds are round and approximately 8 to 18 inches (20 to 45 cm) in diameter, and often do not have external holes. Fresh mounds look moist and fluffy and are relatively untouched by wind and rain. If less than five fresh mounds were found, the location was recorded as a point feature with the GPS unit. When a complex contained more than five fresh mounds, the entire complex (fresh and old mounds) was recorded with the GPS unit as a polygon feature. In general, a "complex" was defined as mounds occurring within approximately 20 meters of adjacent mounds.

Griscom and Keinath (2010) have developed a diagnostic tool to determine pocket gopher species occupancy using easily measurable field variables. This model predicts if mounds are more likely occupied by Wyoming pocket gopher or the more common northern pocket gopher. Input variables for the model were based on a number of significant differences between mound characteristics and cover variables (e.g., burrow diameter, percent bare ground, percent sagebrush cover, etc.) recorded at Wyoming pocket gopher trapping locations, northern pocket gopher trapping locations, and unoccupied control sites (Table 1).

Data recorded at each pocket gopher site include number of fresh mounds, number of old mounds, vegetation type, percent bare ground, percent litter, and burrow diameter. Burrow diameter, in combination with percent bare ground and percent sagebrush cover, is used to determine the probability that the occurrence was likely Wyoming pocket gopher as opposed to northern pocket gopher.

Table 1. Habitat preferences of northern pocket gopher, Wyoming pocket gopher, and unoccupied habitat.

Habitat Component	Habitat Characteristics		
	Unoccupied	Northern Pocket Gopher	Wyoming Pocket Gopher
Dominant Shrub Cover (%)			
Gardner's saltbush	4	5	62
Big sagebrush	60	76	10
Winterfat	0	0	14
Slope	NS	Steeper slopes	Flatter slopes
Tunnel width	NS	Wider tunnels	Narrower tunnels
Litter cover class	More litter cover	More litter cover	Less litter cover
Rock cover class	More rock cover	More rock cover	Less rock cover
Bare soil cover class	Less bare soil	Less bare soil	More bare soil
Perennial grass cover class	NS	More grass cover	Less grass cover

Modified from Griscom et al. 2010.
NS = not significantly different from Wyoming pocket gopher

2.5 MOUNTAIN PLOVER

Mountain plover are discussed in the "Avian Resource Report" for the West Sinclair Rail Facility.

2.6 GREATER SAGE-GROUSE

Greater sage-grouse are discussed in the "Avian Resource Report" for the West Sinclair Rail Facility.

2.7 WESTERN BURROWING OWL

Western burrowing owls are discussed in the "Avian Resource Report" for the West Sinclair Rail Facility.

2.8 AMPHIBIANS AND REPTILES

Two BLM sensitive amphibian species potentially occur in CCSM Project Site: northern leopard frog (*Rana =Lithobates pipiens*) and Great Basin spadefoot toad (*Spea intermontana*). A review of WYNDD occurrence records concluded that the northern leopard frog has been located within the CCSM Project Site; however, the most current record was 1995. A review of WYNDD occurrence records did not indicate an account of Great Basin spadefoot toad in

the CCSM Project Site. Amphibian and reptile monitoring was accomplished through opportunistic wildlife observations while performing other wildlife surveys.

2.9 FISH

The Rail Facility is located in the Sugar Creek watershed and does not contain habitat for any special status fish species. A watershed monitoring plan was prepared to avoid and or minimize adverse impacts to watershed resources present on the CCSM Project Site. The monitoring and mitigation measures presented in the watershed monitoring plan will benefit fisheries. Fish population monitoring within the CCSM Project Site will be conducted by the WGFD in coordination with the BLM.

3.0 RESULTS AND DISCUSSION

3.1 WHITE-TAILED PRAIRIE DOGS

Three white-tailed prairie dog colonies (two active and one inactive) were observed within the planned limits of disturbance of the Rail Facility (Appendix A – Figure A-1). The inactive colony was located on the north-south main rail line. Both active colonies were located within the northern portions of the rail loop. Three additional active colonies were also identified outside of the rail facility limits of disturbance south of the pipeline corridor. Mound conditions in the inactive colonies were old and weather worn, and the majority of burrows were collapsed and or shut-in. No sign of white-tailed prairie dog activity (e.g., scraping, scat, etc.) was present near or surrounding mounds and burrows. The active white-tailed prairie dog colonies within the Rail Facility disturbance area measured 6.4 and 48.6 acres, totaling 55.23 acres, 48% of which are in the Rail Facility LOD. The active colonies were located in a Gardner's saltbush (*Atriplex gardneri*) dominated flat with low herbaceous vegetation cover. Previous surveys in the general area did not document white-tailed prairie dog colonies within the Rail Facility survey area (Western EcoSystems Technologies, Inc. [WEST] 2008, Smith Environmental and Engineering [SMITH] 2010, SWCA 2012, WGFD spatial data per BLM).

3.2 PYGMY RABBIT

Pygmy rabbits were not observed during Rail Facility surveys. Vegetation communities in the survey area typically consist of black greasewood (*Sarcobatus vermiculatus*) assemblages and barren landscapes and do not provide suitable habitat for pygmy rabbit.

3.3 WYOMING POCKET GOPHER

During the Rail Facility survey, two pocket gopher mound complexes were located (Appendix A – Table A.1, Appendix A – Figure A-1). Following the Griscom and Keinath (2010) model, both occurrences were predicted as unknown. Wyoming pocket gophers prefer well-drained gravelly soils on ridges and edges of deeply eroded washes (Clark and Stromberg 1987; Beauvais and Dark-Smiley 2005) and generally avoid low flats containing greasewood (Griscom and Keinath 2010). Dominant vegetation communities in the Rail Facility survey area typically consist of black greasewood (*Sarcobatus vermiculatus*) assemblages and barren landscapes and the majority of the Rail Facility survey area does not provide suitable habitat for pocket gopher.

3.4 AMPHIBIANS AND REPTILES

No observations of amphibians or reptiles were recorded during wildlife surveys of the Rail Facility. The Rail Facility survey area contains limited habitat for amphibian species with Sugar Creek providing the only perennial open water where reproduction could occur. Ephemeral pools suitable for use by spadefoot toads could be present in small amounts in the Rail Facility survey area although no evidence of suitable habitat was recorded during

surveys. It is likely that some reptile activity occurs in the Rail Facility survey area although no special status reptile species would be expected.

3.5 FISH

The Rail Facility survey area does not provide suitable habitat for special status fish species.

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APPENDIX A

Rail Facility Survey Tables and Maps

Table A-1. Pocket Gopher Mound Occurrence.

			Location (UTM - Zone 13)		Mounding (count)		Burrow Diameter (mm)				Vegetation	Sagebrush	Bare Ground	Bare Ground	Litter	POGO Occurrence Model				
Object ID	**Map ID**	**Date**	**Northing**	**Easting**	**Fresh**	**Old**	**D1**	**D2**	**D3**	**Avg**	**(Dominant Cover)**	**%**	**Class***	**(% cover)**	**%**	**Soil**	**ARTR**	**Burrow**	***Species***	***P***
1	NA	09/11/2012	46240653	322659.8	11	7	ND	ND	NS	NA	Sagebrush	13	5	62.5	1-5	5.168	3.54	ND	UNKN	--
30	NA	05/14/2013	4625455.2	319505.2	12	100	58	62	52	57	Rabbitbrush	8	1-5	52	1-5	--	--	--	UNKN	**0.4454**

Table A-2. Opportunistic Wildlife Observations.

Map ID	**Location (UTM – Zone 13)**		**Date**	**Notes**
	Northing	**Easting**		
S01	4625186	319571	05/14/13	One sage thrasher in salt desert shrubland

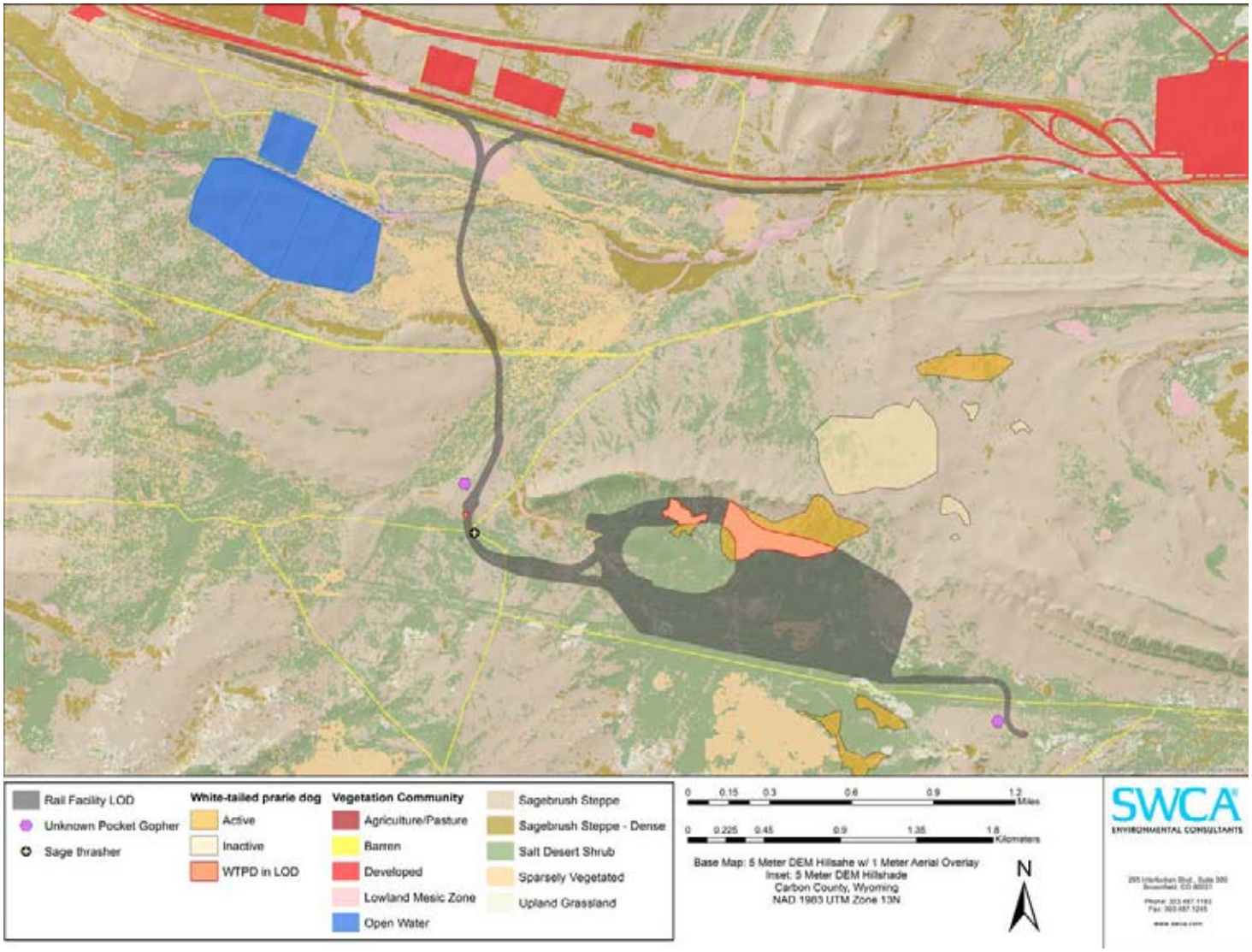

Figure A-1. Locations of White-tailed Prairie Dog, Pocket Gopher, and Sage Thrasher Observations.

APPENDIX O

Chokecherry and Sierra Madre Wind Energy Project
Rare Plant Survey Report

West Sinclair Rail Facility

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. Included in the ROD is the Wildlife Monitoring and Protection Plan for the CCSM Project that identifies measures to be completed for each site-specific plan of development, including wildlife field reviews (BLM 2012: Appendix G). Field reviews are intended to reduce impacts by identifying specific locations where impacts might occur and providing opportunities to avoid, minimize, or mitigate impacts. While not specifically identified in Appendix G of the ROD, rare plant habitat assessments are consistent with the BLM's goal of avoiding or minimizing impacts to sensitive species.

SWCA Environmental Consultants (SWCA) conducted rare plant surveys for the Rail Facility of the CCSM Project in 2012 and 2013. The Rail Facility connects the CCSM Project to the existing Union Pacific Railroad located south of Interstate 80 along the northern boundary of the CCSM Project Site. Rare plant surveys focused on the potential occurrence of ESA-listed and BLM sensitive rare plant species or habitat. Surveys were completed for all planned disturbances associated with the Rail Facility, including a 100 foot buffer around each disturbance area (Figure 1).

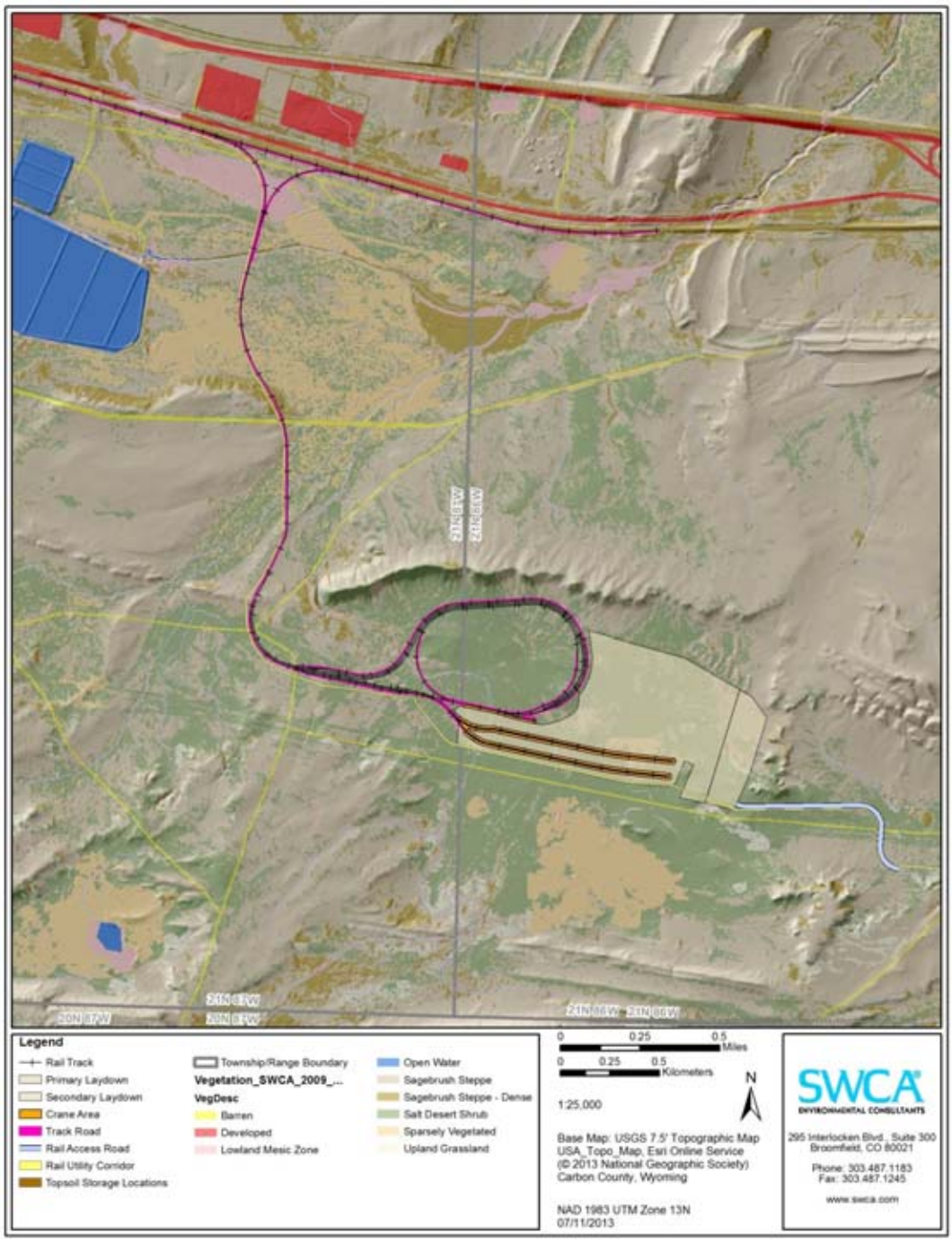

Figure 1. Rail Facility Overview

2.0 BACKGROUND AND METHODS

SWCA biologists conducted habitat assessments and surveys for BLM sensitive plant species and ESA-listed species within the Rail Facility Site, as requested by the RFO. Habitat assessments and surveys were conducted for two federally listed species and three BLM sensitive species (Table 1).

Table 1. Rare Plant Survey Species

Common Name	*Scientific Name*	Status	Habitat
Colorado butterfly plant	*Gaura neomexicana* ssp. *coloradensis*	FT	Sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms; 5,000-6,400 feet
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT	Adapted to early-to mid-seral moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events; 4,200-7,000 feet
Persistent sepal yellowcress	*Rorippa calycina*	BLM-S	Riverbanks and shorelines, usually on sandy soils near high-water line; 5,400-6,600 feet
Meadow milkvetch	*Astragalus diversifolius*	BLM-S	Sagebrush valleys and closed-basin drainages in moist alkaline meadows; 6,500-6,620 feet
Gibbens' beardtongue	*Penstemon gibbensii*	BLM-S	Sparsely vegetated shale or sandy-clay slopes; 5,500-7,700 feet

2.1 COLORADO BUTTERFLY PLANT

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) is a member of the evening primrose family (Fertig 2008a). The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 5–15 cm (2–6 inches) long, while those on the stem are smaller and reduced in number. Flowers are arranged in a branched, elongate pattern above the leaves. Only a few flowers are open at any one time and these are located below the rounded buds and above the mature fruits. Individual flowers are 5–14 millimeters (1/4 - 1/2 inches) long with four reddish sepals (modified leaves surrounding the flower) and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk. Nonflowering plants consist of a stemless, basal rosette of oblong, hairless leaves 3–18 cm (1–7 inches) long. The Colorado butterfly plant is a perennial plant that typically lives from 2-6 years. Typical plants are 1.5 to 2 feet tall with leaves over 1.5 inches long. Blooming periods would range from July through October in higher elevation habitat.

The Colorado butterfly plant occurs primarily in southeastern Wyoming, north-central Colorado, and extreme western Nebraska (Fertig 2008a). It typically occurs in wetlands habitats along the meandering stream channels on the high plains. In undisturbed sites, it grows among native grasses. The Colorado butterfly plant prefers open habitat that is not substantially overgrown by other vegetation. Velvetweed (*Gaura parviflora*) is a similar

species that is an annual with a narrow, elongate inflorescence and flowers less than 3 mm long.

2.2 UTE LADIES'-TRESSES ORCHID

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is a perennial herb with erect, glandular-pubescent stems 12-50 cm tall arising from tuberous-thickened roots (Fertig 2007). Basal leaves are narrowly linear, up to 1 cm wide and 28 cm long, and persist at the time of flowering. Leaves become progressively smaller up the stem and are alternate. The inflorescence is a sparsely pubescent 3-15 cm long spike of numerous small white or ivory-colored flowers arranged in a gradual spiral. Individual flowers are 7.5-15 mm long and faintly fragrant (with a vanilla-like scent). The lip petal is oval to lance-shaped, narrowed at the middle, and has crispy-wavy margins. Sepals are separate or fused only at the base (not fused into a hood-like structure) and are often spreading at their tips. Fruits are cylindric capsules with numerous seeds. Blooming periods would range from August through September in higher elevation habitat. This species does not flower every year and portions of a population may remain dormant below ground each year.

The species is found mostly on low, flat floodplain terraces or abandoned oxbows within 0.5-50 m of small perennial streams or rivers at 4,750-5,400 feet elevation (Fertig 2007). These terrace sites are sub-irrigated, often seasonally flooded, and remain moist into the summer. Soils are typically sandy loams, but also include sands, loams, and silt loams.

The wet meadows communities are dominated by creeping bentgrass (*Agrostis stolonifera*) or switchgrass (*Panicum virgatum*); sometimes with Baltic rush (*Juncus balticus*) or local dominance of fewflower spikerush (*Eleocharis quinqueflora*), in a narrow band between emergent aquatic vegetation and adjacent dry upland prairie. The associated stream channel typically supports submerged stonewort (*Chara* spp.) and emergent vegetation that includes either broadleaf cattail (*Typha latifolia*) or softstem bulrush (*Schoenoplectus tabaernaemontanaei*). Hooded ladies'-tresses orchid(*S. romanzoffiana*) has deeply constricted lip petals, sepals fused for at least ½ their length into a hood-like tube, more densely congested and shorter inflorescence, and typically occurs in montane wetlands.

2.3 PERSISTENT SEPAL YELLOWCRESS

Persistent sepal yellowcress (*Rorippa calycina*) is a rhizomatous perennial herb with stems 10-40 cm tall (Fertig 2008b). The stems and foliage are pubescent throughout with stiff, unbranched hairs. Stem leaves are pinnately divided or wavy-lobed, sessile, and 2.5-5 cm long. The flowers are borne in terminal and axillary inflorescences and have 4 yellow petals 3-5 mm long and 4 sepals that persist in fruit. Fruits are ovoid to nearly globose, 2-4 mm long, and conspicuously pubescent with unbranched hairs that are broadest at the base. Styles in fruit are 1-2 mm long and glabrous. Persistent sepal yellowcress from late May to August, although blooming may extend into October under favorable circumstances.

Persistent sepal yellowcress is found primarily along moist sandy to muddy banks of streams,

stock ponds, and man-made reservoirs near the high-water line at 3,660-6,800 feet (Fertig 2008b). This species is also present in high plain swales that evaporate, and along creeks. Reservoir populations are often in semi-disturbed or recently flooded openings in small inlets or bays with scattered clumps of foxtail barley (*Hordeum jubatum*), Sandberg bluegrass (*Poa secunda*), western wheatgrass (*Pascopyrum smithii*) and a variety of native or exotic early successional forbs, occasionally on grassy shores or in openings amid narrowleaf willow (*Salix exigua*) or saltcedar (*Tamarix chinensis*) thickets.

2.4 MEADOW MILKVETCH

Meadow milkvetch (*Astragalus diversifolius*) is a perennial herb with few to many slender, prostrate or decumbent stems 20-50 cm long radiating from the root crown (Handley and Fertig 2008). The linear to narrowly oval leaf blades are 2-5.5 cm long, and are composed of 1-5 grass-like leaflets, which are 2-5 mm broad. The terminal leaflet is much longer than the lateral leaflets and continuous with the leaf stalk. The inflorescence is a loose raceme of 2-8 flowers. The flowers are white or cream- colored and often faintly lilac-tinged, with calyx tubes 3.2-5.4 mm long. The fruits are oblong (10-17 mm x 3-4 mm). Blooming period is May through June.

Meadow milkvetch occurs in moist, often alkaline meadows and swales in sagebrush valleys or closed drainage basins (Handley and Fertig 2008). In Wyoming, it grows in alkaline meadows at fringes of playa landscapes at 6500-6620 ft. Soils are sub-irrigated silt loams. Associated species include alkali sacaton (*Sporobolus airoides*), clustered field sedge (*Carex praegracilis*), alkali cordgrass (*Spartina gracilis*), lanceleaf goldenweed (*Pyrrocoma lanceolata*), and Colorado thistle (*Cirsium tioganum* var. *coloradense*).

2.5 GIBBENS' BEARDTONGUE

Gibbens' beardtongue (*Penstemon gibbensii*) is a perennial herb with several erect pubescent (rarely glabrous) stems 10-35 cm long (Fertig 2009). The leaves are linear to linear-lanceolate and often folded down the length of the midrib, opposite, smooth-margined, pubescent to glabrate, and mostly less than 5 mm wide.

The inflorescence and flowers (including the sepals) are glandular-hairy. The bright blue corolla is tube-shaped and 15-20 mm long. Anthers sacs are dark purple, 1.2-1.5 mm long, and short hairy on the back. Fruits are oval, tawny-brownish capsules. The blooming period ranges from June to early September depending on spring and summer moisture conditions.

This species is found on barren shale or sandstone slopes of the Browns Park Formation or Laney member of the Green River shale, and it is often located below caprock, on the steep, upper or middle slopes eroding out below the resistant layer (Fertig 2009). The sites are sparsely vegetated slopes of bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), and needleandthread (*Hesperostipa comata*) with scattered shrubs. The easternmost occurrence is found within alderleaf mountain mahogany (*Cercocarpus montanus*) openings.

3.0 RESULTS AND DISCUSSION

Surveys were completed in 2012 and 2013 for BLM-sensitive and ESA-listed plants within the Rail Facility. No BLM-sensitive or ESA-listed plants were identified within the Rail Facility Site. Suitable habitat is not present for Ute ladies'-tresses orchid or Colorado butterfly plant. Habitat for persistent sepal yellowcress, meadow milkvetch, and Gibbens' beardtongue was recorded as sub-marginal. Based on the occurrence of associated species, hydrology, and geology, it is unlikely that any of the three species occurs within the Rail Facility Site. Rare plant species occurrence for the Rail Facility is summarized in Table 2.

Table 2. Rare Plant Species Occurrence

Common Name	*Scientific Name*	Status	Habitat	Occurrence in Rail Facility Site
Colorado butterfly plant	*Gaura neomexicana* ssp. *coloradensis*	FT	Sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms; 5,000-6,400 feet	No
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	FT	Adapted to early-to mid-seral moist to wet conditions, where competition for light, space, water, and other resources is normally kept low by periodic or recent disturbance events; 4,200-7,000 feet	No
Persistent sepal yellowcress	*Rorippa calycina*	BLM-S	Riverbanks and shorelines, usually on sandy soils near high-water line; 5,400-6,600 feet	Unlikely
Meadow milkvetch	*Astragalus diversifolius*	BLM-S	Sagebrush valleys and closed-basin drainages in moist alkaline meadows; 6,500-6,620 feet	Unlikely
Gibbens' beardtongue	*Penstemon gibbensii*	BLM-S	Sparsely vegetated shale or sandy-clay slopes; 5,500-7,700 feet	Unlikely

3.1 COLORADO BUTTERFLY PLANT

No suitable habitat was documented for Colorado butterfly plant during survey of the Rail Facility. Additionally, a review of BLM and WYNDD records confirm that Colorado butterfly plant has not been documented within the vicinity of the CCSM Project including the Rail Facility.

3.2 UTE LADIES'-TRESSES ORCHID

No suitable habitat was documented for Ute ladies'-tresses orchid during survey of the Rail Facility. Follow-up protocol surveys are not required for the Rail Facility Site. Additionally, a review of BLM and WYNDD plant records confirm that Ute ladies'-tresses orchid has not been documented within the vicinity of the CCSM Project including the Rail Facility.

3.3 PERSISTENT SEPAL YELLOWCRESS

No occurrences of persistent sepal yellowcress were documented during survey of the Rail Facility. A review of BLM and WYNDD plant records indicated that persistent sepal

yellowcress has been documented within seven miles of the Rail Facility. While suitable habitat may be present along Sugar Creek and in other wetland habitats, it is unlikely that persistent sepal yellowcress occurs within the Rail Facility Site based on the occurrence of associated species, hydrology, and geology.

3.4 MEADOW MILKVETCH

No occurrences of meadow milkvetch were documented during survey of the Rail Facility. A review of BLM and WYNDD plant records confirm that meadow milkvetch has not been documented within the vicinity of the CCSM Project including the Rail Facility. While habitat for meadow milkvetch could be present along the edges of saline lowland habitats in the northern third of the Rail Facility Site, its presence is unlikely based on the occurrence of associated species, hydrology, and geology.

3.5 GIBBENS' BEARDTONGUE

No occurrences of Gibben's beardtongue were documented during survey of the Rail Facility. A review of BLM and WYNDD plant records confirmed that Gibbens' beardtongue has not been documented within the immediate vicinity of the Rail Facility. While the Rail Facility supports small patches of exposed shale along the southern edges of the Grenville dome that may provide suitable habitat for Gibbens' beardtongue, it is unlikely that the species occurs within the Rail Facility Site based on the occurrence of associated species, hydrology, and geology.

4.0 REFERENCES

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APPENDIX P

Chokecherry and Sierra Madre Wind Energy Project

Waste Management Plan

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September 2013
(Updated March 2014)

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1. Introduction

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on federal land within the CCSM Project Area. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Area are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

Pursuant to requirements of the ROD and the Carbon County Zoning Resolution, as amended, a waste management plan is required for the CCSM Project. This Waste Management Plan (Plan) meets the requirements of Carbon County and the ROD and addresses waste storage, management, minimization and disposal. Categories of materials that will be generated during the CCSM Project include recyclable materials, waste/refuse materials and reusable materials. This Plan will be modified as needed to meet applicable regulations and to address the changing conditions and requirements of the CCSM Project.

1.1 Objectives

The objective of this Plan is to minimize the amount of waste generated by the CCSM Project to the extent practicable. When possible, waste material generated will be recycled, salvaged, re-used or otherwise diverted from direct landfill disposal. Recycling, reusing salvaged building materials and minimizing materials and packaging can reduce waste disposal costs and material expenses. Waste reduction will be achieved through best management practices and recycling or re-use efforts.

PCW and its contractor(s) will be required to follow this Plan for the disposition of the waste generated by their activities. This Plan applies to the construction, operation, maintenance and decommissioning of the CCSM Project.

1.2 Licenses, Permits, Fees, and Taxes

All solid and hazardous wastes related to the construction, operation, maintenance and decommissioning of the CCSM Project will be handled, stored and disposed of in accordance with this Plan and all applicable federal, state, and local laws and regulations. PCW and its contractor(s) will be responsible for any required fees, licenses, permits and taxes.

2. Project Waste Summary

The waste generated by the CCSM Project during construction, operations, maintenance and decommissioning is discussed below.

2.1 Construction

During construction, the CCSM Project will generate municipal solid waste and construction waste from activities such as foundation installation and turbine erection. The amount of waste generated during construction ranges from 9 tons per year (tpy) to a peak of 476 tpy. Annual estimated construction waste is detailed in Attachment A.

2.2 Operations and Maintenance

During operations and maintenance of the CCSM Project, the estimated annual municipal solid waste generation is approximately 60 tpy.

2.3 Decommissioning

PCW anticipates recycling as much of the decommissioned CCSM Project components and materials as possible. The options for wind turbine recycling are evolving, and are expected to be very different at the time of decommissioning than they are currently. Many of the wind turbine components and electrical materials have a high scrap value and will therefore be recycled. The current expectations for the recycling or landfilling of major CCSM Project components and materials are summarized below. The Plan will be updated prior to decommissioning to account for the options available at the time of decommissioning.

- **Wind Turbine Nacelles:** Transported to scrap yards where they will be disassembled, with components reused, scrapped, or landfilled.
- **Wind Turbine Blades/Nacelle Covers:** Most likely broken down and either landfilled or recycled depending upon options available at the time of decommissioning.
- **Wind Turbine Towers:** Transported to scrap yards where they will be recycled.
- **Substation Components:** Resold to reuse if possible, otherwise transported to scrap yards where they will be dissembled, with components reused, scrapped, or landfilled.
- **Recovered Aggregate:** Taken to nearby quarries where they will be reused locally.

The amount of waste generated during decommissioning is estimated to be 85,000 tpy over the three year decommissioning schedule for a combined total of approximately 255,000 tons of decommissioning waste.

2.4 Hazardous Waste

PCW anticipates that small amounts of hazardous waste may be generated during construction, operations, maintenance and decommissioning of the CCSM project. PCW will review any hazardous materials to be used on-site prior to authorizing their use on the Project and will monitor and limit the quantities of hazardous materials brought on-site to minimize the amount of hazardous waste generated. PCW will develop procedures for the storage, use, transportation, and disposal of hazardous materials as part of the Health and Safety Program prior to introducing the hazardous materials on-site. The procedures will identify all hazardous materials that will be used, stored, or transported on-site and will establish requirements for inspection, storage, inventory control, product substitutions, and disposition of excess materials. The procedures will also identify requirements for notices to emergency response agencies.

3. Waste Minimization

PCW and their contractor(s) will minimize the amount of construction waste and debris disposed of in landfills to the extent possible. PCW and their contractor(s) will be responsible for communication and training of field personnel and subcontractors regarding waste management.

3.1 Packaging

All vendors and their suppliers will be encouraged to minimize the packaging for materials and equipment and to identify opportunities for the return of packaging materials for reuse. Packaging materials will be evaluated and their selection will take into consideration opportunities for reuse and recycling.

3.2 Maintenance and Housekeeping

Maintenance and housekeeping activities will be evaluated to identify opportunities to minimize the amount of waste and maximize the amount of recyclable material. PCW and their contractor(s) will manage housekeeping and waste management activities to identify opportunities for waste reduction.

3.3 Materials Storage

All materials will be stored in a manner to prevent contamination, expiration and deterioration. This ensures that the material will meet the specified requirements and that unused or outside-specification products will not become a waste. Inventory control procedures will be implemented by PCW and its contractor(s) to insure that excess materials are not brought on site.

4. Material Disposition

All waste will be stored within designated temporary waste collection areas until it is collected for transport to an approved landfill. Materials that can be recycled will be stored and transported separately. Used oil will not be mixed with other solid or hazardous waste and will be stored separately within appropriate secondary containment in accordance with all applicable rules and regulations. Any concrete waste will be hauled and disposed of at a permitted site (Attachment B). Sanitary waste will be handled by a licensed sanitary waste vendor or disposed of in a permitted wastewater treatment facility.

4.1 Recycling

Recyclable materials for the CCSM Project may include paper, aluminum cans, corrugated cardboard, glass, aerosol cans, wood, plastic, and metals. To the extent local recycling programs are available and can be implemented, these materials will be recycled.

PCW and its contractor(s) will provide containers for waste that is to be recycled. Containers will be clearly labeled as such with a list of acceptable and unacceptable materials and will meet all applicable rules and requirements for the recycling program. Attachment B lists current nformation for area recycling centers.

4.1.1 Empty Containers

A container that held any chemical or hazardous material, except a substance identified as an acute hazardous waste, is defined as an empty container if: 1) all material has been

appropriately removed by pumping, pouring, or aspirating; and 2) no more than 3% by weight of the total capacity of the container remains in the container.

Containers with a capacity of 25 gallons or less that meet the above criteria may be placed in the appropriate recycling container. Empty containers with a capacity of more than 25 gallons shall be managed separately and marked with the words "Empty Container" until they have been inspected.

4.2 Salvage and Reuse

Salvage is the recovery of materials for on-site reuse, off-site sale, or donation to a third party. Reuse is making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. To the extent practicable, materials will be salvaged and/or reused to divert them from landfills.

4.3 Refuse Disposal

Refuse materials will be removed from the CCSM Project Site on a regular basis. PCW and its contractor(s) will not allow refuse to accumulate on-site for extended periods of time. Refuse materials will be transported off site and legally disposed of. Landfill locations and accepted materials are listed in Attachment B. Burning of refuse material will not be permitted.

5. Training

PCW will implement an Environmental Awareness Program (EAP) for CCSM Project personnel to support compliance with environmental requirements, including waste management. PCW's EAP will be designed to consistently communicate the CCSM Project requirements to individuals working on the CCSM Project so that both managers and workers understand PCW's expectations, applicable permit requirements, and how to incorporate them into their daily work activities. All personnel working on the CCSM Project will be required to attend EAP training prior to working on-site, as described in the CCM Project Environmental and Construction Compliance Monitoring Plan. EAP training related to waste management will include general topics such as permit requirements, best management practices, spill prevention and cleanup measures, solid waste disposal, and recycling expectations.

Attachment A. Construction Waste Estimate

Category	TOTAL	2014	2015	2016	2017	2018	2019	2020	2021
PROJECT TOTAL WASTE	***1,738.65***	***8.92***	***30.73***	***97.95***	***475.79***	***379.53***	***78.98***	***354.64***	***312.11***
PROJECT TOTAL CONSTRUCTION W	***1,449.67***	***0.74***	***1.86***	***69.37***	***425.09***	***322.15***	***54.68***	***309.34***	***266.43***
Road Construction	**16.67**	0.74	1.86	3.27	2.20	1.63	3.08	2.26	1.63
WTG Foundation	**300.00**	-	-	47.10	69.30	33.60	51.60	62.40	36.00
Collection System	**157.00**	-	-	-	36.76	41.76	-	40.50	37.98
WTG Install	**710.00**	-	-	-	162.59	192.41	-	183.18	171.82
Collection Substation	**75.00**	-	-	-	30.00	15.00	-	15.00	15.00
Interconnect Station	**30.00**	-	-	-	30.00	-	-	-	-
Transmission Line	**52.00**	-	-	-	34.25	7.75	-	6.00	4.00
On-Site Buildings	**90.00**	-	-	-	60.00	30.00	-	-	-
Rail Facility	**19.00**	-	-	19.00	-	-	-	-	-
PROJECT TOTAL MSW	***288.98***	***8.18***	***28.88***	***28.58***	***50.70***	***57.38***	***24.30***	***45.30***	***45.68***
General Supervision	**288.98**	**8.18**	**28.88**	**28.58**	**50.70**	**57.38**	**24.30**	**45.30**	**45.68**

SPOD 1 TOTAL WASTE	***18.87***	***4.35***	***14.18***	***0.34***	***-***	***-***	***-***	***-***	***-***
SPOD 1 TOTAL CONSTRUCTION W	***2.74***	***0.60***	***1.81***	***0.34***	***-***	***-***	***-***	***-***	***-***
Road Construction	**2.74**	0.60	1.81	0.34	-	-	-	-	-
SPOD 1 TOTAL MSW	***16.13***	***3.75***	***12.38***	***-***	***-***	***-***	***-***	***-***	***-***
General Supervision	**16.13**	**3.75**	**12.38**	**-**	**-**	**-**	**-**	**-**	**-**

SPOD 2 TOTAL WASTE	***47.05***	***2.55***	***8.03***	***26.73***	***4.88***	***4.88***	***-***	***-***	***-***
SPOD 2 TOTAL CONSTRUCTION W	***19.00***	***-***	***-***	***19.00***	***-***	***-***	***-***	***-***	***-***
Rail Facility	**19.00**	-	-	19.00	-	-	-	-	-
SPOD 2 TOTAL MSW	***28.05***	***2.55***	***8.03***	***7.73***	***4.88***	***4.88***	***-***	***-***	***-***
General Supervision	**28.05**	**2.55**	**8.03**	**7.73**	**4.88**	**4.88**	**-**	**-**	**-**

SPOD 3 TOTAL WASTE	***24.34***	***2.02***	***5.83***	***5.18***	***6.38***	***4.95***	***-***	***-***	***-***
SPOD 3 TOTAL CONSTRUCTION W	***0.19***	***0.14***	***0.05***	***-***	***-***	***-***	***-***	***-***	***-***
Road Construction	**0.19**	0.14	0.05	-	-	-	-	-	-
SPOD 3 TOTAL MSW	***24.15***	***1.88***	***5.78***	***5.18***	***6.38***	***4.95***	***-***	***-***	***-***
General Supervision	**24.15**	**1.88**	**5.78**	**5.18**	**6.38**	**4.95**	**-**	**-**	**-**

SPOD 4 TOTAL WASTE	***902.66***	***-***	***2.70***	***65.71***	***464.54***	***369.70***	***-***	***-***	***-***
SPOD 4 TOTAL CONSTRUCTION W	***797.28***	***-***	***-***	***50.04***	***425.09***	***322.15***	***-***	***-***	***-***
Road Construction	**6.77**	-	-	2.94	2.20	1.63	-	-	-
WTG Foundation	**150.00**	-	-	47.10	69.30	33.60	-	-	-
Collection System	**78.52**	-	-	-	36.76	41.76	-	-	-
WTG Install	**355.00**	-	-	-	162.59	192.41	-	-	-
Collection Substation	**45.00**	-	-	-	30.00	15.00	-	-	-
Interconnect Station	**30.00**	-	-	-	30.00	-	-	-	-
Transmission Line	**42.00**	-	-	-	34.25	7.75	-	-	-
On-Site Buildings	**90.00**	-	-	-	60.00	30.00	-	-	-
SPOD 4 TOTAL MSW	***105.38***	***-***	***2.70***	***15.68***	***39.45***	***47.55***	***-***	***-***	***-***
General Supervision	**105.38**	**-**	**2.70**	**15.68**	**39.45**	**47.55**	**-**	**-**	**-**

SPOD 5 TOTAL WASTE	***745.73***	***-***	***-***	***-***	***-***	***-***	***78.98***	***354.64***	***312.11***
SPOD 5 TOTAL CONSTRUCTION W	***630.45***	***-***	***-***	***-***	***-***	***-***	***54.68***	***309.34***	***266.43***
Road Construction	**6.97**	-	-	-	-	-	3.08	2.26	1.63
WTG Foundation	**150.00**	-	-	-	-	-	51.60	62.40	36.00
Collection System	**78.48**	-	-	-	-	-	-	40.50	37.98
WTG Install	**355.00**	-	-	-	-	-	-	183.18	171.82
Collection Substation	**30.00**	-	-	-	-	-	-	15.00	15.00
Interconnect Station	**-**	-	-	-	-	-	-	-	-
Transmission Line	**10.00**	-	-	-	-	-	-	6.00	4.00
On-Site Buildings	**-**	-	-	-	-	-	-	-	-
SPOD 5 TOTAL MSW	***115.28***	***-***	***-***	***-***	***-***	***-***	***24.30***	***45.30***	***45.68***
General Supervision	**115.28**	**-**	**-**	**-**	**-**	**-**	**24.30**	**45.30**	**45.68**

Attachment B. Waste Facilities

Company Contact & Location	Distance from Project Entrance	Cost per Ton	Construction Materials Accepted?	Contaminated Soils Accepted?	Hazardous Materials Accepted?	Other Items not Accepted? (tires, bulbs, size restrictions)	Recycling at Facility?	Jurisdiction Limits	Current Capacity of Facility
Rawlins Landfill Department 915 3rd Street Rawlins, WY 82301	10 miles	$60/Ton	Yes	No	No	Yes, extra charges.	Aluminum, cardboard, Plastic #1 and #2	Carbon County	Several Years
Sweetwater Rock Springs Landfill Rock Springs, WY 82901	110 miles	$55/Ton	Yes	Yes, in small amounts	No	No	Limited, metal, batteries, oil	All of Sweetwater County, western Carbon County, southern Sublette and Fremont Counties	400,000 cubic yards, building additional capacity
Moffat County Municipal Solid Landfill 1850 County Road 107 Craig, CO 81625	118 miles	$70/Ton (out of state)	Yes	No	No	Yes, extra charges.	No	None, extra charges apply outside of Colorado.	Unidentified
Saratoga Landfill 110 E. Spring Avenue Saratoga, WY 82331	43 miles	$60/Double axel load	Yes	No	No	Yes	Metal, paper, plastic, glass	District extends from Encampment to I-80. No map is publically available.	2 years
Laramie Landfill 1167 N. 4th Street Laramie, WY 82072	101miles	$40/Ton	Yes	No	Household Only	Yes	Green waste and metals	Albany County Only	40 years
Cheyenne Landfill 1461 Happy Jack Road Cheyenne, WY 82009	150 miles	$49/Ton	Yes	Contaminated with gasoline is accepted	No	No bulbs	Wood, metal, pvc, plastics	Southern Laramie Only	Unidentified

APPENDIX Q

Chokecherry and Sierra Madre Wind Energy Project

Spill Prevention, Control, and Countermeasure (SPCC) Plan

West Sinclair Rail Facility

Prepared for:

555 Seventeenth Street
Suite 2400
Denver, CO 80202

Prepared by:

Westwood Professional Services, Inc.
7699 Anagram Drive
Eden Prairie, Minnesota 55344

October 2013

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[Reserved for Figure 3: West Sinclair Rail Facility Layout]

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Appendix A: Substantial Harm Determination
Appendix B: Plan Review Log
Appendix C: Emergency Contacts
Appendix D: Discharge Notification Form
Appendix E: Record of Secondary Containment Drainage
Appendix F: Calculation of Secondary Containment Capacity
Appendix G: Monthly Facility Inspection Checklist
Appendix H: Discharge Prevention Briefings and Training Log

1.0 INTRODUCTION

This Spill Prevention, Control, and Countermeasure (SPCC) Plan has been prepared for construction and operation of the West Sinclair Rail Facility (Facility) located in Carbon County, Wyoming approximately two miles south of Sinclair, Wyoming (**Figure 1**). The Facility is part of the Chokecherry and Sierra Madre Wind Energy Project and consists of rail track, a rail loop, laydown yards, and an access road (**Figure 3**). For the purposes of this SPCC Plan, the term "Facility" is defined as the West Sinclair Rail Facility.

This SPCC Plan has been prepared to meet the applicable requirements of Title 40, Code of Federal Regulations, Part 112 (40 CFR 112). The purpose of this SPCC Plan is to describe the procedures, methods, and equipment that are used to prevent the discharge of oil into navigable waters of the United States or their adjoining shorelines, and to minimize and abate hazards to human health and the environment should such an event occur.

Power Company of Wyoming LLC has evaluated the Facility and determined that this Facility does not pose a risk for substantial harm and that preparation of a Facility Response Plan, pursuant to 40 CFR 112.20, is not required (**Appendix A)**.

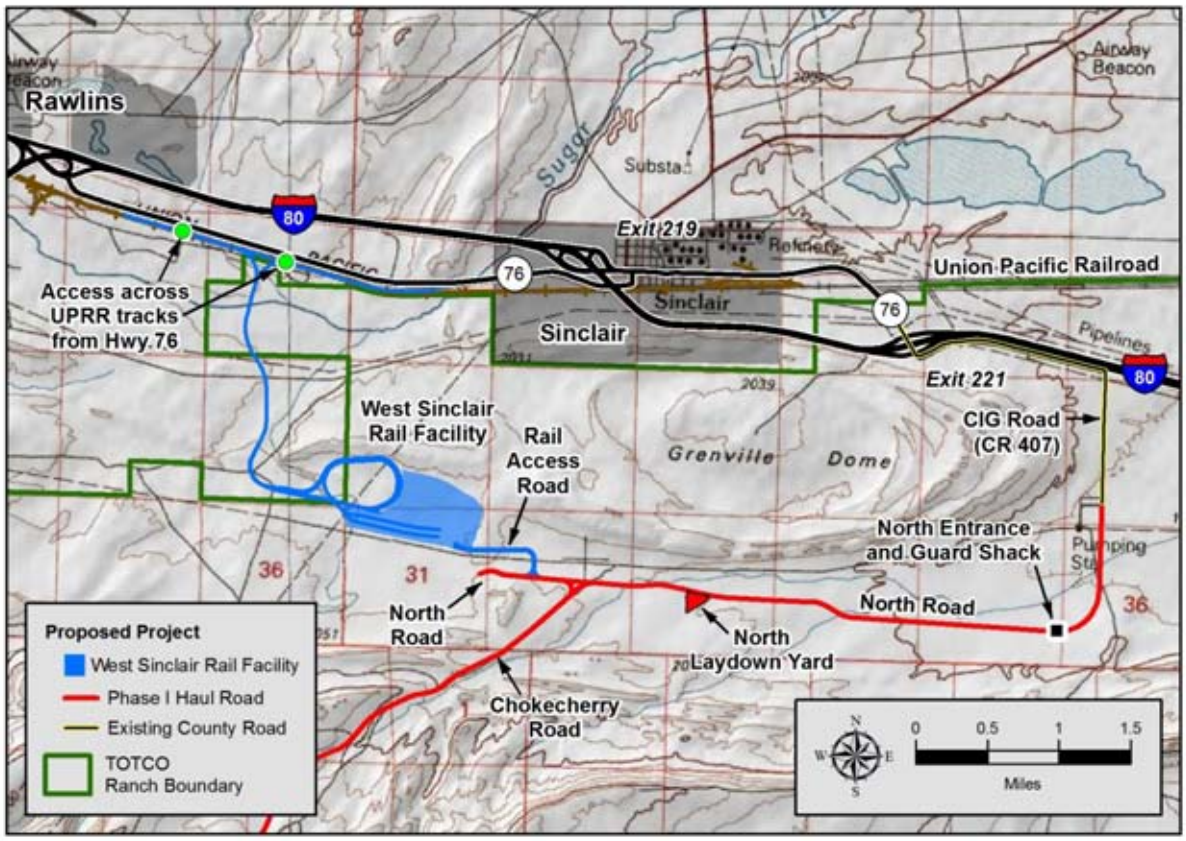

Figure 1. Facility Location Map

1.1 Professional Engineer Certification

I hereby certify the following with respect to this SPCC Plan:

- I am familiar with the applicable requirements of 40 CFR 112;
- I have visited and examined the Facility, or have supervised examination of the Facility by appropriately qualified personal;
- This SPCC Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of 40 CFR 112;
- The procedures for required inspections and testing have been established; and
- This SPCC Plan is adequate for the Facility, as described herein.

This certification in no way relieves the owner or operator of the Facility of his/her duty to prepare and fully implement the SPCC Plan in accordance with the requirements of 40 CFR 112.

_____

Signature

_____

Name and Title

_____

PE Registration Number

[SEAL]

_____

Date

_____

Telephone Number

1.2 Management Approval and Designated Person

Power Company of Wyoming LLC is the owner of the Facility. Power Company of Wyoming LLC has engaged [*General Contractor*] as the General Contractor for the Chokecherry and Sierra Madre Wind Energy Project, including the Facility. This SPCC Plan is being managed by Power Company of Wyoming LLC and applies to construction and operation of the Facility. Power Company of Wyoming LLC will prepare separate SPCC Plans for the construction and operation of the remainder of the Chokecherry and Sierra Madre Wind Energy Project, including the Road Rock Quarry, Phase I Haul Road and Facilities, and wind development areas.

Power Company of Wyoming LLC is committed to preventing discharges of oil into navigable waters of the United States through implementation, regular review, and amendment to the SPCC Plan during construction and operation of the Facility. Power Company of Wyoming LLC has committed the necessary resources to implement the measures described in this SPCC Plan.

I am the designated SPCC Emergency Coordinator and am responsible for implementation of this SPCC Plan. To the best of my knowledge, this SPCC Plan is accurate.

_____

Name

_____

Title

_____

Date

1.3 Location of SPCC Plan

A complete copy of this SPCC Plan will be maintained at the Safety Trailer located at the West Sinclair Rail Facility. Notice of the location of the SPCC Plan will be posted on the facility information board at the West Sinclair Rail Facility.

1.4 Plan Review

The SPCC Plan will be reviewed and amended as needed under the following circumstances:

- When there is a change in Facility design, construction, operation or maintenance that materially affects the Facility's potential for discharge of oil into navigable waters of the United States;
- In the event of a spill into waters of the United States or adjoining shorelines;
- In the spring prior to the commencement of each construction season; or
- At least once every five years during operations.

Each SPCC Plan review, including whether SPCC Plan amendments are required, will be documented in the Plan Review Log, **Appendix B**. If amendments to this SPCC Plan are required as a result of the review, the SPCC Plan will be amended within one month. Technical revisions to the SPCC Plan will be certified by a Professional Engineer. Amendments will be implemented as soon as possible, but no later than six months following amendment of the SPCC Plan.

1.5 Cross-Reference with SPCC Provisions

This SPCC Plan does not follow the exact order presented in 40 CFR part 112. **Table 1-1** below presents a cross-reference of the sections of this SPCC Plan relative to the applicable parts of 40 CFR part 112.

Table 1-1: SPCC Cross-Reference

Provision	Plan Section	Page
112.3(d)	1.1 Professional Engineer Certification	2
112.3(e)	1.3 Location of SPCC Plan	4
112.5	1.4 Plan Review	4
112.7	1.2 Management Certification of the Plan	3
112.7	1.5 SPCC Provision Cross-Reference	4
112.7(a)(3)	2.0 General Facility Information	6
	Figure 1	Attached
112.7(a)(4)	4.4 Discharge Notification	18
112.7(a)(5)	4.0 Discharge Response	15
112.7(b)	3.3 Potential Discharge Volumes and Direction of Flow	10
112.7(c)	3.4 Containment and Diversionary Structures	10
112.7(d)	3.6 Practicability of Secondary Containment	11
112.7(e)	3.7 Inspections, Tests, and Records	11
112.7(f)	3.8 Personnel, Training and Discharge Prevention Procedures	12
112.7(g)	3.9 Security	12
112.7(h)	3.10 Loading/Unloading	13
112.7(i)	3.11 Fracture Evaluation	15
112.7(j)	3.12 Conformance with Applicable State and Local Requirements	15
112.8(b)	3.5 Containment Drainage	11
112.8(c)(1)	2.3 Oil Storage	8
112.8(c)(2)	3.4 Containment and Diversionary Structures	10
112.8(c)(3)	3.5 Containment Drainage	11
112.8(c)(6)	3.7 Inspections, Tests, and Records	11
112.8(c)(8)	3.4 Containment and Diversionary Structures	10
112.8(c)(10)	3.7 Inspections, Tests, and Records	11
112.8(d)	3.7 Inspections, Tests, and Records	11
112.20(e)	Certification of Substantial Harm Determination	Appendix A
112.20(f)2(i)	2.4 Discharge Potential	9

2.0 GENERAL FACILITY INFORMATION

2.1 Facility Description

Owner:	Power Company of Wyoming LLC
Operator:	[*General Contractor*]
Facility:	West Sinclair Rail Facility [*Address*] [*City, State Zip*] [*Phone #*]

The Facility is located in Carbon County, Wyoming, as shown on the attached U.S. Geological Survey quadrangle maps (**Figure 2)**. The Facility consists of the components described in Section 1.0 and shown on **Figure 3**. Construction of the Facility will disturb approximately 369.9 acres initially and 121.2 acres long-term. The main access to the Facility is from Interstate 80, Exit 221via CR407. The Facility is surrounded by agricultural land characterized by areas of salt desert shrub and sagebrush steppe.

Construction and operation of the Facility is anticipated to require the handling, storage, and use of oil such as gasoline, diesel, fuel oil, and motor oil. Petroleum products such as these will be stored at the laydown yards in aboveground storage tanks (AST) and drums. The products are used by [*General Contractor*] and its subcontractors primarily for vehicle fueling and maintenance, as well as the operation of equipment. **Figure 3** shows the location and layout of the Facility components, including the location of oil storage, loading/unloading and transfer areas, as well as primary spill control structures.

Hours of operation for the Facility are typically between 7:00AM and 7:00PM, 6 days per week, although hours are variable and alternate hours, including nighttime operations, may be required to support construction of the Chokecherry and Sierra Madre Wind Energy Project.

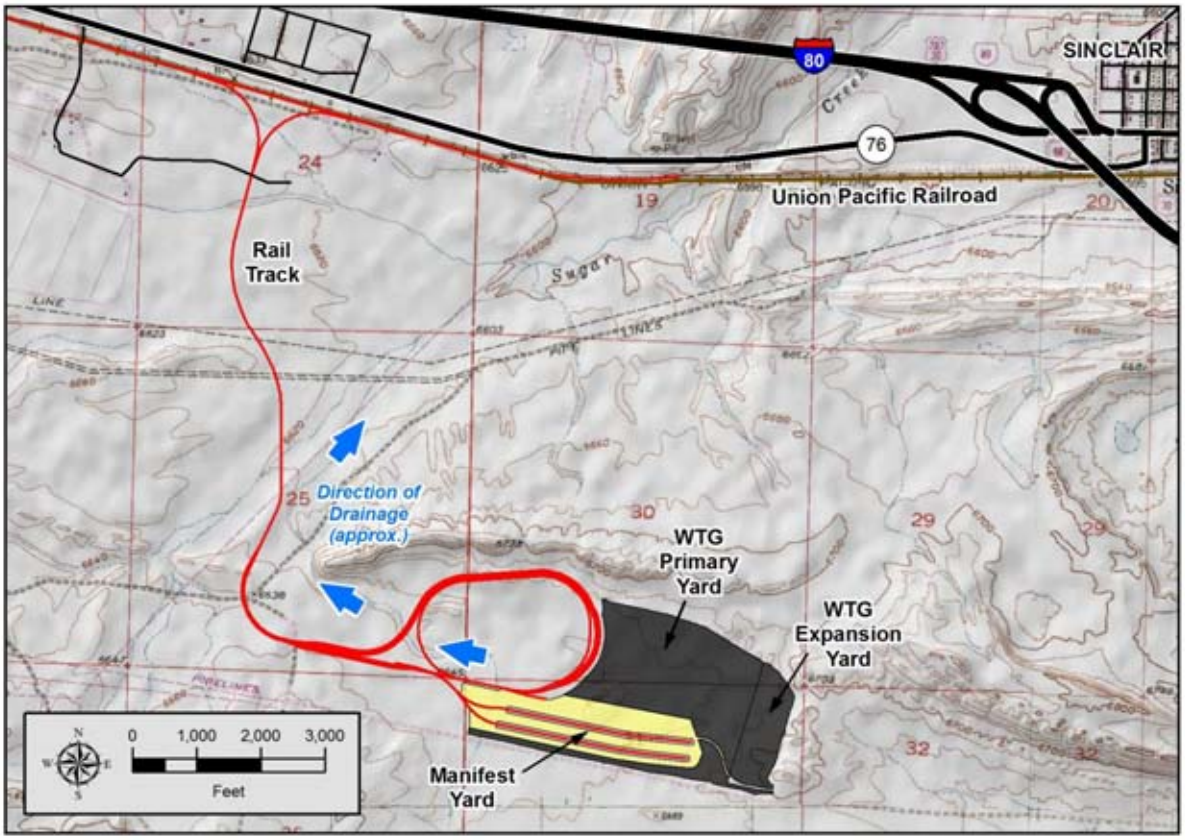

Figure 2. USGS Topographic Map

2.2 Responsibility

To fully implement this SPCC Plan, the assistance and cooperation of multiple parties is required. The following descriptions outline key roles and responsibilities involved in the implementation of this SPCC Plan.

POWER COMPANY OF WYOMING LLC

Power Company of Wyoming LLC is the owner of the Facility. The Owner has overall responsibility for the development and implementation of the SPCC Plan. Owner responsibilities include:

- Ensure those who work with oil on the Facility are aware of and follow the requirements of this SPCC Plan;
- Ensure those who work with oil on the Facility follow the established policies and procedures of this SPCC Plan; and
- Enforce the requirements of this SPCC Plan.

[*RESERVED FOR GENERAL CONTRACTOR*]

Power Company of Wyoming LLC has engaged [*General Contractor*] as the General Contractor for the West Sinclair Rail Facility. [*General Contractor*] is responsible for the construction and operation of the Facility. General Contractor responsibilities include:

- Serve as SPCC Emergency Coordinator;
- Perform inspections to ensure compliance with the provisions of this SPCC Plan;
- Coordinate training and maintain training records;
- Maintain security of oil storage areas;
- Notify Owner of any releases;
- Investigate oil releases;
- Provide the proper notification for environmental releases;
- Ensure corrective action is taken in the event of a release;
- Coordinate disposal of waste materials;
- Ensure that emergency response equipment is available and working properly; and
- Update the SPCC Plan as required.

[*RESERVED FOR SUBCONTRACTOR*]

[*General Contractor*] has engaged subcontractors to support the construction and operation of the Facility. Subcontractor responsibilities include:

- Follow the established policies and procedures of this SPCC Plan;
- Adhere to fuel transfer procedures established in the SPCC Plan;
- Ensure personnel have appropriate training; and
- Inform General Contractor of any releases and ensure that corrective action is taken.

2.3 Oil Storage

Bulk oil storage at the Facility consists of [*quantity*] fixed ASTs and various 55 gallon drums. An inventory of the oil stored at the Facility is shown in **Table 2-1**. All containers with capacity of 55 gallons or more are included, unless otherwise exempt from the rule. Storage containers used at the Facility are constructed of steel or plastic. The design and construction of all bulk storage containers is compatible with the material stored within considering pressure and temperature.

Table 2-1: Oil Storage Inventory				
ID	Capacity (gallons)	Content	Description	Party Responsible for Oil Storage
Primary Laydown Yard				
1	[*TBD*]	Diesel	Aboveground Storage Tank (within secondary containment)	[*General Contractor*]
2	[*TBD*]	Fuel	Aboveground Storage Tank (within secondary containment)	[*General Contractor*]
3	[*TBD*]	Various Oils	55 Gallon Drums (within secondary containment)	[*General Contractor*]
Secondary Laydown Yard				
4	[*TBD*]	Diesel	Aboveground Storage Tank (within secondary containment)	[*General Contractor*]
5	[*TBD*]	Fuel	Aboveground Storage Tank (within secondary containment)	[*General Contractor*]
6	[*TBD*]	Various Oils	55 Gallon Drums (within secondary containment)	[*General Contractor*]

2.4 Discharge Potential

Both the Primary and Secondary Laydown Yards (**Figure 3)** are located on relatively flat terrain and consist of a compacted gravel surface. Drainage generally flows west within the Laydown Yards, and eventually reaches an unnamed tributary of Sugar Creek. From this unnamed tributary the drainage eventually reaches Sugar Creek.

This Facility is new construction; therefore, there is no previous history of any discharge at the Facility.

3.0 DISCHARGE PREVENTION

The following measures will be implemented to prevent oil discharges during the handling, use or transfer of oil products at the Facility. All employees that handle oil will receive training in the proper implementation of the measures (Section 3.8).

3.1 Facility Layout Diagram

The Facility location is shown on the attached U.S. Geological Survey quadrangle map (**Figure 2). Figure 3** shows the general layout and direction of surface water runoff. As required under 40 CFR 112.7(a)(3), **Figure 3** also indicates the location and contents of any ASTs, underground storage tanks (USTs), transfer stations, and connecting piping.

3.2 Spill Reporting Procedures

A list of emergency contacts is provided in **Appendix C**. The Discharge Notification Form, **Appendix D,** will be completed upon immediate detection of a discharge and prior to reporting a spill to the proper authorities. More detailed spill reporting procedures are contained in Section 4.4.

3.3 Potential Discharge Volumes and Direction of Flow

Table 3-1 below contains the expected volume, discharge rate, and general direction of flow in the event of equipment failure at the Facility. The means of secondary containment at each location is also identified.

Table 3-1: Potential Discharge Volumes and Direction of Flow

Potential Event	Maximum volume released (gallons)	Maximum discharge rate	Direction of flow	Secondary Containment
Primary Laydown Yard (Tanks #X-X)				
Tank overfill	TBD	TBD	TBD	TBD
Hose leak during tank truck unloading	TBD	TBD	TBD	TBD
Dispenser hose rupture	TBD	TBD	TBD	TBD
Secondary Laydown Yard (Tanks #X-X)				
Tank overfill	TBD	TBD	TBD	TBD
Hose leak during tank truck unloading	TBD	TBD	TBD	TBD
Dispenser hose rupture	TBD	TBD	TBD	TBD

3.4 Containment and Diversionary Structures

Methods of secondary containment at the Facility include a combination of structures and land-based spill response to prevent oil from reaching navigable waters and adjoining shorelines.

Berms. The ASTs and other storage containers are stored within an earthen berm containment area at the laydown yards. The bottom and sides of the berm have an impermeable liner to restrict the flow of oil outside the containment area. The height of the berm provides adequate freeboard for precipitation.

Drip pans. During fueling operations outside of the secondary containment structures, drip pans will be used to contain small leaks from piping/hose connections. Drip pans may also be used during emergency field repair and maintenance of oil-filled equipment.

Sorbent material. Spill cleanup kits that include absorbent material, booms, and other portable barriers are located near the oil storage area in the laydown yards. The spill kits are located within close proximity of the oil product storage and handling areas for rapid deployment in the event of a discharge outside the containment area. In addition, portable spill kits are located in all equipment.

3.5 Containment Drainage

The earthen berms surrounding tanks at the laydown yards are drained by [*General Contractor*] using manually activated pumps following precipitation events. The retained rainwater is inspected by [*General Contractor*] prior to draining to ensure that only oil-free water is discharged. A sorbent filter boom will be used to absorb any oils in the containment areas. Drainage events are recorded in the log included in **Appendix E**.

3.6 Practicability of Secondary Containment

Secondary containment was determined to be practicable for all oil storage containers at the laydown yards.

3.7 Inspections, Tests, and Records

Visual inspections of tanks and containment areas are conducted monthly. Inspections include evaluation of the outside of the container for signs of deterioration, discharges, or accumulation of oil inside containment areas. The monthly inspection checklist is provided in **Appendix G**. The monthly inspections cover the following key elements:

- Observation of the exterior of aboveground storage tanks, pipes, and other equipment for signs of deterioration, leaks, corrosion, and thinning;
- Observation of the exterior of portable containers for signs of deterioration or leaks;
- Observation of the tank fill and discharge pipes and hoses for signs of wear or poor connections that could cause a discharge, and tank vent for obstructions and proper operation;
- Verification of the proper functioning of overfill prevention systems; and
- Review of the inventory of discharge response equipment and restocking as needed.

Each aboveground tank will be tested for integrity at least annually and whenever material repairs are made. Integrity testing will consist of a detailed visual inspection in accordance with the Steel Tank Institute (STI) *Standard for the Inspection of Aboveground Storage Tanks*, SP-001, latest version.

All findings regarding tanks, piping, containment, or response equipment that require action will be immediately reported to the SPCC Emergency Coordinator. Visible oil leaks from tank walls, piping, or other components will be repaired as soon as possible to prevent a larger spill or discharge to navigable waters or adjoining shorelines. Pooled oil will be removed immediately upon discovery.

3.8 Personnel, Training, and Discharge Prevention Procedures

The SPCC Emergency Coordinator is responsible for oil discharge prevention, control, and response preparedness activities at the Facility. Personnel who handle oil will be trained in the operation and maintenance of oil pollution prevention equipment, discharge procedure protocols, applicable pollution control laws, rules and regulations, general facility operations, and the content of this SPCC Plan. Any new Facility personnel responsible for handling oil will be provided with this same training prior to being involved in any oil handling operation associated with the Facility.

Annual discharge prevention briefings will be held by the SPCC Emergency Coordinator for all Facility personnel involved in oil handling operations. The briefings are aimed at ensuring adequate understanding of the SPCC Plan and will highlight and describe known discharge events or failures, malfunctioning components and any recently developed precautionary measures.

Records of the briefings and discharge prevention training will be kept on the form contained in **Appendix H** and maintained with this SPCC Plan for a period of three years from the briefing/training date.

3.9 Security

The laydown yards will be staffed during normal working hours. The Chokecherry and Sierra Madre Wind Energy Project will be secured at each main entry point using a combination of gates, fencing, and security guards. Laydown yards will have lighting in areas that are actively used to aid in the discovery of discharges after dark and to deter acts of vandalism. Drain valves will be locked in the closed position to prevent unauthorized opening at all times. Fill caps on the tanks will also be locked at all times when not in operation. The fuel dispenser will be chained and locked when the Facility is not attended. With the dispenser locked in place, the fuel dispensing pump will be turned off.

3.10 Loading/Unloading

There is no dedicated loading/unloading rack at the Facility. Tank truck loading/unloading procedures conform to regulations established by the U.S. Department of Transportation. [*General Contractor*] will ensure that vendors understand the site layout, that they know the protocols for unloading oil products, and that they have the necessary equipment to respond to a discharge from the vehicle or fuel delivery hose.

Vehicle filling and unloading operations at the laydown yards will be performed by Facility personnel trained in proper discharge prevention procedures. The truck driver or Facility personnel will stay with and monitor the vehicle at all times while fuel is being transferred. Transfer operations will be performed according to the procedures listed in **Table 3-2** below.

Table 3-2: Fuel Transfer Procedures

Stage		Tasks
Prior to loading/ unloading	☐	Visually check hoses for leaks and wet spots.
	☐	Verify the sufficient volume is available in the storage tank or truck
	☐	Lock in the closed position all drainage valves of the secondary containment structure
	☐	Secure the tank vehicle/set parking brakes
	☐	Verify proper alignment of valves and proper functioning of the pumping system.
	☐	If filling a tank truck, inspect the lowest drain and all outlets.
	☐	Establish adequate bonding/grounding prior to connecting to the bulk fuel transfer point.
	☐	Turn off cell phone.
	☐	No smoking.
During loading/ unloading	☐	Driver must stay with the vehicle at all times during loading/unloading.
	☐	Periodically inspect all systems, hoses and connections.
	☐	When loading, keep internal and external valves on the receiving tank open along with the pressure relief valves.
	☐	When making a connection, shut off the vehicle engine. When transferring flammable liquid, shut off the engine unless it is used to operate a pump.
	☐	Maintain communication with the pumping and receiving stations.
	☐	Monitor the liquid level in the receiving tank to prevent overflow.
	☐	Watch for any leaks or spills. Any small leaks or spills should be immediately stopped and then absorbed and disposed of properly.
After loading/ unloading	☐	Make sure the transfer operation is complete.
	☐	Close all tank and loading valves before disconnecting.
	☐	Secure all hatches.
	☐	Disconnect all grounding/bonding wires from the bulk fuel transfer point.
	☐	Make sure the hoses are drained to remove remaining oil before moving them away from the connection. Use a drip pan.
	☐	Cap the end of the hose and other connecting devices before moving them to prevent uncontrolled leakage.
	☐	Inspect the lowest drain and other outlets on tank truck prior to departure. If necessary, tighten, adjust, or replace caps, valves, or other equipment to prevent oil leaking while in transit.
	☐	Inspect the loading/unloading point and tank to verify that no leaks have occurred or that any leaked or spilled material has been cleaned up and disposed of properly.

3.11 Fracture Evaluation

Not applicable. There are no field constructed tanks at the Facility.

3.12 Conformance with State and Local Applicable Requirements

Storm water runoff from the Facility is generally discharged to the west and the north, generally flowing to Sugar Creek as permitted under the WYPDES General Permit to Discharge Storm Water [*Reserved for WYPDES permit #*]. The waterways and drainage flows are shown generally in **Figure 2**.

The following types of spills will be reported to the Wyoming Department of Environmental Quality (DEQ) immediately upon discovery:

- Releases of oil or hazardous substances that enter waters of the state
- Releases of oil or hazardous substances greater than 25 gallons that pose a threat to enter waters of the state, including groundwater.

The SPCC Emergency Coordinator will immediately notify the Wyoming DEQ of the type, quantity and location of the release and of the response, containment and cleanup actions that have been taken or are proposed to be taken (307-777-7781).

Within (7) days following a release the SPCC Emergency Coordinator will submit a complete written report to the Wyoming DEQ describing the reportable release and steps taken to prevent a reoccurrence.

4.0 DISCHARGE RESPONSE

This section describes the response and cleanup procedures in the event of an oil discharge to groundwater, surface water, or soil. Immediate action will be taken to control, contain, and recover discharged oil.

In general, the following steps will be taken:

- Eliminate potential spark sources;
- If possible and safe to do so, identify and shut down the source of discharge to stop the flow;
- Contain the discharge with containers, sorbents, berms, trenches, sandbags, or other material;
- Contact the SPCC Emergency Coordinator or his/her alternate;
- Contact regulatory authorities and the response organization and report the release; and
- Collect and dispose of recovered products according to regulation.

For purposes of establishing appropriate response procedures, this SPCC Plan classifies discharges as either "minor" or "major", depending on the volume and characteristics of the material released. A list of Emergency Contacts is provided in **Appendix C**. This list identifies personnel to be contacted in case of emergency and will be posted on the facility information board at the Facility.

4.1 Response to a Minor Discharge

A "minor" discharge is defined as one that poses no significant harm (or threat) to human health and safety or to the environment. Minor discharges are generally those where:

- The quantity of product discharged is small (may involve less than 25 gallons of oil);
- Discharged material is easily stopped and controlled at the time of discharge;
- Discharge is localized near the source;
- Discharged material is not likely to reach water, groundwater or field drains;
- There is little risk to human health and safety; and
- There is little risk of fire or explosion.

Minor discharges can usually by cleaned by Facility personnel. The following procedures apply:

- Immediately notify the SPCC Emergency Coordinator;
- Under direction of the SPCC Emergency Coordinator, contain the discharge with discharge response materials and equipment. Place discharge debris in properly labeled waste containers; and
- The SPCC Emergency Coordinator will complete the discharge notification form in **Appendix D** and attach a copy to this SPCC Plan.

4.2 Response to a Major Discharge

A "major" discharge is defined as one that cannot be safely controlled or cleaned up by Facility personnel, such as when:

- The discharge is large enough to spread beyond the immediate discharge area;
- The discharged material enters water; groundwater or sewer drains
- The discharge requires special equipment or training to clean up;
- The discharge material poses a hazard to human health or safety; or
- There is a danger of fire or explosion.

In the event of a major discharge, the following guidelines apply:

- Safety of personnel is the primary concern. No countermeasures that risk the health or safety of personnel should be undertaken;
- If the SPCC Emergency Coordinator is not present at the Facility, the senior on-site person shall notify the SPCC Emergency Coordinator of the discharge and has the authority to initiate notification and response;
- No smoking, open flames, cell phones, or other spark inducing equipment is permitted in the area of a flammable material spill;
- If possible and safe, Facility personnel should stop the source of the leak or spill by closing a valve, turning off a pump, sealing a hole, etc. If Facility personnel feel comfortable containing the spill, personnel should use absorbent pads, booms, sand and/or speedi-dri materials to stop the spread of the spill. Contaminated soil should be placed on an impermeable liner for containment;
- Emergency medical treatment and first aid shall be administered by personnel certified in first aid/CPR. The SPCC Emergency Coordinator (or senior on-site person) will call for medical assistance if workers are injured;
- Establish fire prevention measures in the vicinity of the spill. Divert traffic (vehicular and pedestrian) from the area. The SPCC Emergency Coordinator (or senior on-site person) will call the local Fire Department of Police Department;
- If Facility personnel are unsure of the hazards involved or the amount of the spill is too large or a release to navigable waters or adjoining shorelines is threatened, the SPCC Emergency Coordinator (or senior on-site person) will call for outside assistance from a spill response/cleanup contractor;
- The SPCC Emergency Coordinator (or senior on-site person) will immediately call the National Response Center (800-424-8802) and the Wyoming DEQ (307-777-7781);
- The SPCC Emergency Coordinator (or senior on-site person) will complete the discharge notification form in **Appendix D** and attach a copy to this SPCC Plan; and
- The SPCC Emergency Coordinator (or senior on-site person) will coordinate cleanup and contract cleanup contractor as necessary. If the SPCC Emergency Coordinator is not available at the time of the discharge, then the next highest person in seniority assumes responsibility for coordinating response activities.

4.3 Waste Disposal

Waste resulting from a minor discharge will be contained in impervious bags, drums, or buckets. The SPCC Emergency Coordinator will characterize the waste for proper disposal and ensure it is removed from the Facility by a licensed waste hauler.

Wastes resulting from a major discharge response will be removed and disposed of by a licensed cleanup contractor. Waste materials will be disposed of in accordance with applicable federal and state regulations.

4.4 Discharge Notification

Any size discharge that affects or threatens to affect navigable waters (i.e., one that creates an oil film, sheen, emulsion, or sludge upon navigable waters or adjoining shorelines) must be reported immediately to the National Response Center (1-800-424-8802). The National Response Center is staffed 24 hours a day.

The following types of spills must be reported to the Wyoming Department of Environmental Quality (DEQ) immediately upon discovery:

- Releases of oil or hazardous substances which enter waters of the state
- Releases of oil or hazardous substances greater than 25 gallons that pose a threat to enter waters of the state, including groundwater.

The SPCC Emergency Coordinator will immediately notify the Wyoming DEQ of the type, quantity and location of the release and of the response, containment and cleanup actions that have been taken or that are proposed to be taken (307-777-7781). Within (7) days following a release the SPCC Emergency Coordinator must submit a complete written report to the Wyoming DEQ describing the reportable release and steps taken to prevent a reoccurrence.

In addition, 40 CFR 112.4 requires that information be submitted to the United States Environmental Protection Agency (EPA) Regional Administrator and the appropriate state agency in charge of oil pollution control activities (see contact information in **Appendix C**) whenever the facility discharges more than 1,000 gallons of oil to a navigable water in a single event, or discharges more than 42 gallons of oil to navigable waters in each of two discharge incidents within a 12-month period.

Contact information for reporting discharges to the appropriate authorities is listed in **Appendix C** and is also posted on the facility information board at the Facility. A summary sheet is included in **Appendix D** to facilitate the reporting. The person reporting the discharge will provide the following information:

- Name, location, organization, and telephone number;
- Name and address of the party responsible for the incident;
- Date and time of the incident;
- Source and cause of the release or discharge;
- Type of material(s) released or discharged;
- Quantity of materials released or discharged;
- Danger or threat posed by the release or discharge;
- Number and type of injuries, if any;

- Media affected or threatened by the discharge (i.e., water, land, air);
- Weather conditions at the incident location; and
- Any other information that may help emergency personnel respond to the incident.

APPENDICES

Appendix A
Substantial Harm Determination

Facility Name: West Sinclair Rail Facility
Facility Address: [*Address*]
[*City, State Zip*]

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

   Yes ___ No __x__

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

   Yes ___ No __x__

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in 40 CFR part 112 Appendix C, Attachment C-III or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

   Yes ___ No __x__

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in 40 CFR part 112 Appendix C, Attachment C-III or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

   Yes ___ No __x__

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

   Yes ___ No __x__

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Signature	Title
Name (type or print)	Date

Appendix B
Plan Review Logs

Five Year Review Log

Review Date	SPCC Plan Amendment		Name and signature of person authorized to review this SPCC Plan
	Will Amend	Will Not Amend	
	☐	☐	
	☐	☐	
	☐	☐	
	☐	☐	

Technical Amendment Log

Review Date	Description of Technical Amendment	Name and signature of licensed Professional Engineer certifying this technical amendment

Appendix C
Emergency Contacts

SPCC Emergency Coordinator: [*Name*], [*Company and Title*], xxx-xxx-xxxx

EMERGENCY TELEPHONE NUMBERS

Power Company of Wyoming LLC:

[*Name*], Project Manager	xxx-xxx-xxxx
[*Name*], Safety Manager	xxx-xxx-xxxx

[*General Contractor*]:

[*Name*], Project Superintendent	xxx-xxx-xxxx
[*Name*], Safety Manager	xxx-xxx-xxxx
[*Name*], Project Manager	xxx-xxx-xxxx
[*Name*], Alternate SPCC Emergency Coordinator	xxx-xxx-xxxx

[*Designated Cleanup Contractor*]:

[*Name*], Designated Spill Contractor	xxx-xxx-xxxx

Local Emergency Response:

Carbon County 911	911
Carbon County Sheriff	307-324-2776
Carbon County Fire Department	307-328-2720

Notification:

National Response Center	800-424-8802 (24 hours/day)
U.S. Environmental Protection Agency, Region 8	303-293-1788
Wyoming Department of Environmental Quality	307-777-7718

Appendix D
Discharge Notification Form

In the event of a discharge to navigable waters or adjoining shorelines, the following information will be provided to the National Response Center (Section 4.4).

Facility Name:	West Sinclair Rail Facility		
Address:	[*Address*] [*City, State Zip*]		
Telephone:	xxx-xxx-xxxx		
Operator:	[*General Contractor*] [*Address*] [*City, State Zip*]		
Primary Contact:	[*Name*], [*Company and Title*], xxx-xxx-xxxx		
Discharge Date:		Discharge Time:	
Weather Conditions and Temperature:			
Name of Reporting Individual:			
Type of Material:			
Quantity Released:			
Estimate Quantity Released to Navigable Waters:			
Cause of Discharge:			
Action taken to stop, remove and mitigate the effects of the discharge:			
Media affected:	Soil Water (specify): Other (specify):		
Damages or injuries:	No ⍐Yes	Type of Injury:	
Organizations and individuals contacted:	Fire/Police/Ambulance	#911	Time:
	Carbon County Fire Dept.	#307-328-2720	Time:
	National Response Center	#800-424-8802	Time:
	Wyoming DEQ	#307-777-7781	Time:
	SPCC Emergency Coordinator	#xxx-xxx-xxxx	Time:
	Cleanup Contractor	#xxx-xxx-xxxx	Time:

Appendix E
Record of Secondary Containment Drainage

This record will be completed when rainwater from secondary containment is drained from or pumped out of secondary containment. The bypass valve will normally be sealed in a closed position. It will be opened and resealed following drainage under responsible supervision. Rainwater will not to be drained if oil or an oily sheen is present.

Date	Time	Area Drained	Presence of Oil (Y/N)	Signature

Appendix F
Calculations

[*To be provided: Contractor to provide containment berm dimensions prior to construction. Engineer will verify as part of certification.*]

Calculation of Secondary Containment Capacity (Primary Laydown Yard)

Calculation of Secondary Containment Capacity (Secondary Laydown Yard)

Appendix G
Monthly Facility Inspection Checklist

The following checklist will be used for monthly inspections. Completed checklists must be signed by the inspector and maintained at the Facility with the SPCC Plan for at least three years. Any item that receives a "yes" answer must be reported to the SPCC Emergency Coordinator and addressed immediately.

Item	Y	N	Description & Comments
Storage Tanks			
Tank surfaces show signs of leakage	☐	☐	
Tanks are damaged, rusted, or deteriorated	☐	☐	
Bolts, rivets, or seams are damaged	☐	☐	
Tank supports are deteriorated or buckled	☐	☐	
Level gauges are inoperable	☐	☐	
Vents are obstructed	☐	☐	
Containment Areas			
Secondary containment is damaged or stained	☐	☐	
Standing water in containment	☐	☐	
Drainage valve is open or not secure	☐	☐	
Evidence of oil release from tank	☐	☐	
Safety			
Safety equipment missing or inoperable	☐	☐	
Spill response equipment used and not replaced	☐	☐	
Fire extinguisher not present / operational			
Fuel tank not grounded			

Signature: _____ Date: _____

Appendix H
Discharge Prevention Briefing and Training Log

Oil-handling personnel will be trained in the operation and maintenance of oil pollution prevention equipment, discharge procedure protocols, applicable pollution control laws, rules and regulations, general facility operations, and the content of the SPCC Plan.

Annual discharge prevention briefings will be held to ensure adequate understanding of the SPCC Plan. The briefings will also highlight and describe known discharge events or failures, malfunctioning components and any recently developed precautionary measures.

Date	Subjects Covered	Employees in Attendance	Instructor(s)

APPENDIX R

Chokecherry and Sierra Madre Wind Energy Project

Health and Safety Plan

555 Seventeenth Street
Suite 2400
Denver, CO 80202

September 2013
(Updated March 2014)

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1.0 INTRODUCTION

Power Company of Wyoming LLC (PCW) proposes to construct, operate, maintain and decommission the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project), located in Carbon County, Wyoming. The CCSM Project consists of up to 1,000 wind turbines capable of generating approximately 2,000 to 3,000 megawatts (MW) of clean, renewable wind energy. The primary components of the CCSM Project include the wind turbine generators, an internal road network, a rail facility, a quarry, an internal electrical collection and transmission system, substations, and operations and maintenance buildings.

The CCSM Project is located south of the city of Rawlins, primarily within the bounds of the Overland Trail Ranch (Ranch). The Ranch is owned and operated by PCW affiliate, The Overland Trail Cattle Company LLC (TOTCO). The Ranch is situated within an area of alternating sections of private and Federal lands commonly referred to as the "checkerboard." The vast majority of the private lands are owned by TOTCO and the Federal lands are administered by the Bureau of Land Management (BLM) Rawlins Field Office (RFO). A small percentage of the land within the Ranch is owned by the State of Wyoming and is administered by the State Board of Land Commissioners. Finally, Anadarko Land Corporation owns some sections located on the periphery of the northwest boundary of the Ranch.

In 2008, PCW applied to BLM for right-of-way grants to construct, operate, maintain and decommission the CCSM Project on Federal land within the CCSM Project Site. On June 29, 2012, the Notice of Availability for the Final EIS concerning the CCSM Project was published in the Federal Register (77 FR 63328). On October 9, 2012 the Secretary of the Interior signed the Record of Decision (ROD). In the ROD, BLM determined that over 200,000 acres within the CCSM Project Site are suitable for wind energy development subject to the requirements described under the Selected Alternative in the ROD. The area that was determined to be suitable for wind energy development consists of two wind development areas (WDAs) in which turbines would be located. The northern WDA is known as Chokecherry and the southern WDA is known as Sierra Madre. The WDAs are located approximately 9 miles apart.

Prior to issuing right-of-way grants for the CCSM Project, BLM will conduct subsequent environmental analysis of site-specific plans of development submitted by PCW. The site-specific plans of development will be screened against the analysis conducted in the EIS and the requirements described under the Selected Alternative in the ROD. PCW anticipates submitting five (5) site-specific plans of development to BLM, consisting of the following:

1. Phase I Haul Road and Facilities
2. West Sinclair Rail Facility
3. Road Rock Quarry
4. Phase I Wind Development
5. Phase II Wind Development (including Phase II Haul Road and Facilities)

This plan describes the general health and safety requirements for PCW employees, its contractors and any other persons working on-site on the CCSM Project (PCW personnel) during construction, operations, maintenance and decommissioning of the CCSM Project, including all

of the facilities listed above. This Health and Safety Plan will be modified and expanded as needed to meet applicable regulations and to address the changing conditions and requirements of the CCSM Project. This plan may be augmented or superseded by a site-wide safety plan put in place by the construction general contractor or operating agent to the extent that it addresses the topics covered in this document.

PCW requires that any contractor or operating entity working on the CCSM Project provide a safety policy and health and safety plan meeting all applicable regulatory requirements pertaining to their scope of work. All personnel on the CCSM Project Site (general contractor, subcontractor, vendor, PCW, and BLM) must adhere to this plan, any additional health and safety requirements of their respective plans, as well as any site-wide safety plan that is put in place for the CCSM Project.

To the extent any provision of any other safety plan conflicts with a provision of this plan, the more stringent or exacting provision shall apply. This plan in no way relieves any person of any obligation to comply with the Occupational Safety and Health Act or any other applicable health and safety law or regulation. In the event that the provisions of this plan conflict with any such applicable law, such applicable law shall supersede the provisions of this plan. Nor shall this plan in any way create any liability for PCW with respect to the actions or inactions of other parties (including contractors and subcontractors) made in connection with the CCSM Project. Such liability shall be determined and allocated pursuant to contracts entered into by PCW and such parties to provide goods or services for the CCSM Project or otherwise to permit entry to the CCSM Project Site.

2.0 COMMUNICATION

PCW personnel must coordinate all work on the CCSM Project Site with on-site staff, including the Site Coordinator and/or Ranch Manager. A list of on-site staff is provided in Attachment A and will be updated as needed throughout the CCSM Project.

2.1 WORK PLAN NOTIFICATION

PCW personnel must notify on-site staff of their proposed work plan, including a description and schedule of activities, at least one week prior to conducting work on the CCSM Project Site. PCW personnel must also notify on-site staff of any relevant modifications to their proposed work plan as soon as practicable.

2.2 CHECK-IN/CHECK-OUT

The work plan coordinated with on-site staff should establish a daily check-in/check-out procedure for the duration of work on the CCSM Project Site. Ideally the Site Coordinator will be responsible for checking PCW personnel on and off the CCSM Project Site daily; however, alternate on-site staff or off-site contacts are acceptable if mutually agreed upon.

2.3 COMMUNICATION DEVICES

All PCW personnel are encouraged to work in teams and are required to carry at least one communications device per team provided they are working in close proximity. If team members are not working close enough together to summon help verbally, each person must

have their own method of communication. Multiple methods of communication per person and team are encouraged. Examples of effective communications devices are cell phones, satellite phones, ranch radios, or SPOT receivers.

2.4 PUBLIC RELATIONS

PCW personnel should work to maintain good relationships with neighboring landowners and the public. Work planned near the boundary of the Ranch should be identified in the work plan notification to the Site Coordinator. The Site Coordinator and Ranch Manager are responsible for contacting and coordinating with neighboring landowners in advance. PCW personnel may not cross property lines or access a neighbor's land without permission from the landowner.

If PCW personnel are approached or contacted by a neighboring landowner or the public, PCW personnel should be polite and respectful at all times. All inquiries from neighboring landowners should be directed to the Site Coordinator or Ranch Manager and inquiries from the public should be directed to the PCW Vice President – Land and Environmental Affairs. PCW personnel may discuss generalities regarding the work being done on the Ranch; however, details regarding the work and any plans or findings should not be discussed. All contact with neighboring landowners or the public regarding the CCSM Project should be reported to the PCW Vice President – Land and Environmental Affairs as soon as possible and not more than 48 hours after the contact. Once construction commences, a telephone number will be posted at the North and South Entrances to the CCSM Project Site for members of the public to contact PCW with questions or comments.

3.0 VEHICLES

Use of personal vehicles on the CCSM Project Site is discouraged. It is recommended that PCW personnel use rental vehicles or one of PCW's all-terrain vehicles (ATVs) while on-site. PCW personnel unfamiliar with the operation of ATVs should request an orientation from the Site Coordinator. If personnel are uncomfortable operating ATVs after an orientation, they should request alternate transportation while onsite, such as riding with the Site Coordinator in a truck, sport utility vehicle (SUV) or utility vehicle (UTV). Personnel are required to keep all trucks and SUV on existing ranch two-track roads. Only ATV/UTV and foot traffic is allowed off-road.

All trucks and SUVs are required to display a PCW window hanger while on-site. The hangers must be prominently displayed so that TOTCO employees can identify them at a distance, e.g., hung from the rearview mirror or taped to the windshield. PCW personnel can obtain window hangers from the Site Coordinator.

PCW personnel shall comply with speed limits where applicable and are expected to operate all vehicles at safe speeds in consideration of other personnel, wildlife, and road conditions. Driving any vehicle onsite at high speed is not appropriate, regardless of vehicle ownership and driver skill level. If ground conditions are wet to the point where driving would cause ruts more than four inches deep, travel should be suspended until drier conditions develop.

4.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

PCW personnel working on the CCSM Project Site away from vehicles are recommended and/or required to use the following personal protective equipment, as indicated in the following sections and as applicable to their work on-site.

4.1 HIGH VISIBILITY VESTS

High visibility vests, preferably with PCW logos, must be worn at all times while on-site and away from vehicles for personal safety. PCW personnel can obtain high visibility vests from the Site Coordinator.

4.2 HEAD PROTECTION

PCW personnel should wear a helmet while riding an ATV or UTV. PCW personnel can obtain helmets from the Site Coordinator.

4.3 EYE PROTECTION

PCW personnel should wear some form of eye protection while riding an ATV or UTV, such as clear or tinted glasses or a helmet equipped with a visor. PCW personnel can obtain eye protection from the Site Coordinator.

4.4 BOOTS/SHOES

PCW personnel should wear sturdy boots while onsite, preferably leather. Open-toed shoes (such as sandals) are not allowed.

5.0 FIRE PREVENTION

To minimize the potential for fires on the CCSM Project Site, PCW personnel will park all vehicles away from tall vegetation and will only smoke inside closed-cab vehicles. PCW will provide fire extinguishers inside all CCSM Project trailers.

6.0 CODE OF CONDUCT

The CCSM Project Site is part of a working cattle ranch. PCW personnel are expected to treat the Ranch, livestock, wildlife, equipment and Ranch personnel with respect at all times. Specific aspects of the code of conduct are discussed below; however, PCW personnel are required to treat the Ranch with respect and to use common sense and courtesy at all times.

6.1 ALCOHOL AND ILLEGAL DRUGS

PCW will not tolerate alcohol or the use of illegal drugs on the Ranch, no exceptions. Any PCW personnel bringing illegal drugs or alcohol on-site will be escorted off the site regardless of whether or not the alcohol or illegal drugs were consumed.

6.2 WEAPONS

PCW personnel may not bring weapons or firearms onto the Ranch, including the CCSM Project trailers, even if they are left in vehicles.

6.3 RECREATION

PCW employees may recreate on the Ranch on personal time, only with the express permission of the Ranch Manager. PCW employees are not allowed to hunt on-site, no exceptions.

6.4 LIVESTOCK

The Ranch is an operating cattle ranch. If PCW personnel are working in pastures where cattle are located, care should be taken to avoid livestock to the extent possible. Work in occupied pastures should be coordinated with the Site Coordinator.

6.5 WILDLIFE

PCW personnel should be respectful of wildlife, maintain a good distance, and avoid disturbance. PCW personnel should only interact with wildlife if trained for such interaction and/or it is part of that person's scope of work. Harassment of wildlife will not be tolerated.

7.0 SECURITY

While working on-site, PCW personnel are expected to assist in keeping the Ranch secure by leaving gates in the condition they are found, i.e. open or closed, unless otherwise directed by the Site Coordinator or Ranch employees. If PCW personnel encounter a closed gate on-site, they may proceed through the gate, but must close it behind them.

Some gates on the Ranch are locked for security. Gate lock combinations change periodically, and can be obtained from the Site Coordinator or Ranch Manager. All gate codes are confidential and should not be released to non-PCW personnel. If a locked gate is encountered that cannot be opened with the current combination, PCW employees should first attempt to contact the Site Coordinator or Ranch Manager for an alternate combination. If neither can be reached and PCW personnel must pass through the gate to complete important work, PCW personnel may cut the chain to open the gate. If cutting the chain is not an option, PCW personnel may cut the lock. Under no circumstances should PCW personnel ever cut a fence.

If during the course of their work PCW personnel observe unknown or suspicious people or vehicles on-site, PCW personnel should contact the Site Coordinator or Ranch Manager. If neither can be reached, PCW personnel should call the Carbon County Sheriff's Department (307-324-2776) to report the potential trespass. PCW personnel should not confront potential trespassers directly under any circumstances.

8.0 HAZARDOUS MATERIALS

PCW does not anticipate that its personnel will need significant amounts of hazardous materials in connection with their authorized work. Any PCW personnel who require hazardous materials to complete their work must request approval from the Vice-President – Land and Environmental Affairs prior to bringing any hazardous materials on-site. All requests for the use of hazardous materials on the CCSM Project Site will include an MSDS and will identify any non-hazardous alternatives to the proposed material. If the use of hazardous materials on the CCSM Project Site by PCW personnel is authorized, hazardous materials will be managed in accordance with all applicable rules and regulations. PCW employees do not currently manage hazardous materials on the CCSM Project Site.

9.0 INCIDENT RESPONSE

Should an incident occur on-site, PCW personnel should summon emergency assistance as needed. When responding to incidents, PCW personnel should first insure their own personal safety and then assist other personnel if they are qualified and able to provide assistance.

9.1 EMERGENCY ASSISTANCE

To summon emergency assistance, PCW should use all methods of communication available to them until contact is made and a response is confirmed. The following emergency communications methods are generally available on the CCSM Project Site:

1. Ranch Radio: call for help on channel 1
2. Cell Phone: call 911 and request assistance
3. Cell Phone: call the Carbon County Sheriff's Department at 307-324-2776
4. SPOT Receiver: press and hold the SOS button for at least 10 seconds

When summoning help, PCW personnel will provide as much detail as possible regarding the nature of the incident, the location, and potential access routes to the location. If a GPS is readily available, coordinates should be provided. When possible, PCW personnel should maintain contact with emergency assistance until help has arrived.

9.2 INCIDENT REPORTING

PCW personnel are required to report all health and safety incidents to their immediate supervisor as soon as possible, regardless of whether emergency assistance was required. Supervisors are responsible for insuring that PCW General Counsel has been notified and that an incident report has been completed within 48 hours following of the incident.

ATTACHMENT A

Health and Safety Plan Contact List

Role	Name	Contact Information
Site Coordinator	Jason Theesfeld	Mobile: (307) 710-7751
Ranch Manager	John Finegan	Mobile: (970) 948-3296
General Counsel (PCW)	Roxane Perruso	Work: (303) 299-1342
General Counsel (Ranch)	Joe Tippetts	Work: (303) 299-1392
Vice President – Land and Environmental Affairs	Garry Miller	Work: (303) 299-1546
Director of Engineering	Ryan Jacobson	Work: (303) 299- 1354