

# Site Selection of Power Plant for Load Growth

Prepared for



**Revision 1**

February 5, 2014

**FINAL**



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## PURPOSE

NorthWestern Energy (NWE) has identified a need for a power generation facility to respond to electrical system load growth. Thus, the proposed plant will provide “capacity” on NWE’s electrical transmission system. The initial generation technology selection is proceeding and generally the consideration is a plant of about 250 MW or more with multiple generating units for operational flexibility and reliability. The units are planned to be combined cycle gas turbines.

This report by CB&I Stone & Webster, Inc. (CB&I) 1) documents the various site locations considered around the State of Montana for the new power plant, 2) summarizes the notable positive and negative aspects of each site, 3) outlines the site selection process, and 4) identifies the preferred site for development of the proposed power plant.

## DESCRIPTIONS OF CONSIDERED SITES

Fifteen sites were considered for the proposed power plant. These sites were initially identified by NWE. The sites were independently assessed by CB&I on the basis of available information, including input from and discussions with NWE, and visits to the potential sites. The fifteen sites are listed below and their general location shown in Attachment 1.

Anaconda (existing Mill Creek site)	Highwood
Big Sandy (Verona sub)	Kalispell
Billings Area	Main Line 1 / Cut Bank
Corette	Missoula
Dry Creek Storage	Silver Bow
Great Falls/ MFM	Telstad/Shelby
Havre Pipeline	Warren
Helena	

The basic attributes for each considered site are discussed below. The summary for each site includes commentary concerning the attractiveness of the site for development. The rationale and process to comparatively rank the sites is detailed at “Site Screening Methodology”, later in this report.

### Anaconda/Mill Creek

The proposed plant site would be on NWE’s land at its Dave Gates Generating Station, located about four miles east of Anaconda and 23 miles northwest of Butte. NWE owns 60 acres, which includes the switchyard. Gas supply is available; NWE’s 12-inch gas line to Anaconda is about 2.5 miles northwest of the site. NWE’s 24-inch gas feed line extends to the plant. However, substantial line and/or compression upgrades may be needed depending on the size of the new generation facility.

Electrical transmission is available, with 161 kV lines nearby and 230 kV Mill Creek-Wilsall line in the area. An existing rail spur is adjacent to the site. Water supply is available from the 36-inch Silver Lake water pipeline under the City of Anaconda allotment. Upgrades to the

existing Mill Creek water line may be needed depending on the configuration of the new generation facility.

The site is in the immediate Anaconda city area. Permits are in place for the existing Mill Creek facility so a basis has been established for permitting of the expansion.

Mill Creek is a brown-field site. Four years of site air quality data is available. Positive attributes of this site make it favorable for consideration for development.

### **Big Sandy/Verona**

This site, in the area southwest of Havre at the existing Verona substation, was considered since an attractive fuel gas supply is potentially available from Havre Pipeline/Many Islands Pipeline delivering gas from Canada. This area is near the location of NWE's Box Elder gas storage facility. However, this storage facility has a limited capacity.

Electrical transmission in the area is constrained with 69 kV and 161 kV lines. Transmission flow from the area would be to the congested portion of NWE's system in Great Falls. Rail service is available in the area, across the highway from the prospective site area. No notable constraint to the necessary water supply was identified. However, being an agricultural area, water supply may be less readily available and could involve notable efforts to develop, versus some other sites.

The Big Sandy/Havre/Box Elder area is a less developed area where a new power plant may be more intrusive than at some other sites. Rocky Boy's Indian Reservation, Fort Belknap Indian Reservation, and Upper Missouri River Breaks National Monument are all in the area. These factors plus electrical transmission constraints indicate a limited potential for developing a site in the Big Sandy area in a timely manner. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site at Big Sandy is considered not attractive for further consideration at this time.

### **Billings**

The general area of Billings was considered. Fuel gas availability is limited by the capacity of existing pipelines. The situation has been discussed with regional suppliers and indications have been received that capacity upgrades and long term supply may be available at reasonable cost.

Electrical transmission is constrained in the Billings area on existing 230 kV lines. However, the combination of the Corette plant shutdown and local load growth may mitigate this situation. Rail service is available in the Billings area. No notable constraint to the necessary water supply was identified.

Billings is the largest city in Montana, with considerable projected load growth. There is already significant industrial development in the area (existing refineries and thermal power plants). The Crow Indian Reservation is down-wind of the area (less than 10 miles southeast). Yellowstone Park is southwest of the area. The current owner of the coal-fired Corette unit is planning a shutdown in 2015 due to changing environmental regulations. Shutdown of the coal plant may provide mitigation of environmental concerns for the area. If Corette is shut down as planned, electrical interconnection constraints indicate additional capacity will be needed in the Billings area. Although specific site attributes have not been identified in the context of the limited scope

of this initial screening, a plant site at Billings is considered attractive for further consideration at this time.

### **Corette**

The existing Corette coal-fired power plant is located in the metropolitan Billings area on the Yellowstone River. Vehicle access is from Interstate 90 and there is a rail spur on site that is currently used for coal delivery. The site is owned by PPL Montana.

Fuel gas availability is limited by the capacity of existing pipelines. The situation has been discussed with regional suppliers and indications have been received that capacity upgrades and long term supply may be available at reasonable cost.

Electrical transmission is constrained in the Billings area on existing 230 kV lines. However, the combination of the Corette plant shutdown and local load growth may mitigate this situation. Rail service is available in the Billings area.

The existing Corette plant obtains makeup water from the Yellowstone River and uses river water for once through cooling. Given the current environmental regulations, it is unlikely that a new plant would be allowed to continue to use once through cooling. However, it is considered feasible to extend the existing consumptive water use rights for a new plant.

Billings is the largest city in Montana, with considerable projected load growth. There is already significant industrial development in the area (existing refineries and thermal power plants). The Crow Indian Reservation is down-wind of the area (less than 10 miles southeast). Yellowstone Park is southwest of the area. The current owner of the coal-fired Corette unit is planning a shutdown in 2015 due to changing environmental regulations. Shutdown of the coal plant may provide mitigation of environmental concerns for the area. If Corette is shut down as planned, electrical interconnection constraints indicate additional capacity will be needed in the Billings area. Although specific site attributes such as ownership of the plant and the clean-up of ash and coal residues have not been considered in the context of the limited scope of this initial screening, siting the new generation facility at the existing Corette site is considered attractive for further consideration at this time.

### **Dry Creek Storage**

The proposed site would be on NWE's land at their Dry Creek natural gas storage and compression facility about 55 miles southwest of Billings. The area is open grassland/grazing in rolling/hilly topography. The site is generally remote and is accessed by 10 miles of county dirt road from Highway 72, south of Bridger. Gas supply is available; Dry Creek storage has a limited capacity. Gas pipelines of Colorado Interstate Gas, Williston Basin Interstate, and Energy West Resources are in the area.

Electrical transmission is constrained on 50 kV lines. Transmission flow from the area would be to the congested area of the system in Billings. There is no rail or major road in the immediate area. Existing rail is down-valley at Bridger. There is no developed water source to support power plant operations. Groundwater wells would need to be developed.

The site is an existing utility development with existing permitting and environmental control plans. The Crow Indian Reservation is 20 miles to the east, and Yellowstone National Park is

approximately 50 miles southwest of the site. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site at Dry Creek is considered not attractive for further consideration at this time.

### **Great Falls/MFM**

The abandoned Montana First Megawatts (MFM) site in Great Falls was considered. This site is near NWE's Great Falls 230 kV switchyard. This area is on a high bluff, north of the Missouri River and Rainbow Reservoir. Fuel gas is available; NWE's 10-inch line from the north runs through the area although upgrades may be needed depending on the size of the new generating facility.

Electrical transmission is significantly congested in the Great Falls area and there is a notable queue backlog for interconnection to the system. Rail service is available in the Great Falls area. No notable constraint to the necessary water supply was identified. A few miles of new water line may be needed to tie to the city water system, if appropriate.

Great Falls is a large city where there may be resistance to development of a new power plant. This has been demonstrated recently by complications for other proposed projects. Also, the Lewis & Clark Interpretive Center is nearby on the south side of the Missouri River, as well as Giant Springs State Park. This stretch of the river may be a migratory bird pathway. Although the site itself is in an industrial park, there is a growing housing development encroaching from the west. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site at Great Falls is considered not attractive for further consideration at this time.

### **Havre Pipeline**

This site, in the area east of Havre, approximately at the junction of the Havre Pipeline and U.S. Route 2, was considered since an attractive fuel gas supply is potentially available from Havre Pipeline/Many Islands Pipeline delivering gas from Canada. This area is near the location of NWE's Box Elder gas storage facility. However, this storage facility has a limited capacity.

Electrical transmission in the area is constrained with 69 kV and 161 kV lines. Transmission flow from the area would be to the congested portion of NWE's system in Great Falls. Rail service is available in the area, across the highway from the prospective site area. No notable constraint to the necessary water supply was identified. However, being an agricultural area, water supply may be less readily available and could involve notable efforts to develop, versus some other sites.

The Havre/Chinook area is a less developed area where a new power plant may be more intrusive than at some other sites. Rocky Boy's Indian Reservation, Fort Belknap Indian Reservation, and Upper Missouri River Breaks National Monument are all in the area. These factors plus electrical transmission constraints indicate a limited potential for developing a site in the Havre area in a timely manner. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site in the Havre area is considered not attractive for further consideration at this time.

## **Helena**

The general area of the Helena valley was considered. Fuel gas is available; NWE's north-south 16-inch line from Cut Bank runs through the area. As for any site south of Augusta, substantial line and/or compression upgrades are needed for the necessary additional gas transmission capability.

Electrical transmission is present in the Helena area, with existing 69 kV and four-100 kV lines. 230 kV capability would likely be needed to transmit plant output. Rail service is available in the Helena area. No notable constraint to the necessary water supply was identified.

Helena is a growing area. There may likely be resistance to development of a new power plant. A site in the Helena area is considered not likely permitable in a timely manner. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site in the Helena area is considered not attractive for further consideration.

## **Highwood**

Highwood is an existing site approximately eight miles east of Great Falls near the town of Highwood. The site is fairly large, having originally been planned for a coal-fired plant and then to be a combined cycle plant. However, only a simple cycle gas-fired plant has been built. The site is owned by Southern Montana Electric. Although there is gas and electric transmission service for the existing plant, upgrades to both would be needed for the new generation facility.

No rail access to the site was observed and the nearest paved road is a secondary road (Highwood Road).

Highwood is a small town in a largely agricultural area with some housing development. There is existing significant industrial development in the area near the town of Belt. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, development at the Highwood site is considered not attractive for further consideration at this time.

## **Kalispell**

A site in the Kalispell area was considered although no specific location was identified. Kalispell is in the developing Flathead Lake recreation area and would be upwind of Glacier National Park.

The area was initially considered because of possible access to natural gas fuel from Canada. Electrical transmission in the area is limited to that required for the existing, small hydroelectric plants. A site in the Kalispell area is considered not liking permitable in a timely manner.

Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site in the Kalispell area is considered not attractive for further consideration at this time.



### **Mainline 1/Cut Bank**

The proposed plant site would be on NWE's land at its natural gas system Main Line 1 (ML1) compressor station, located about 4 miles east of Cut Bank. NWE owns approximately 40 acres at the station site. Gas supply for a generating facility of the size planned is questionable. NWE's Cobb gas storage facility, the main natural gas storage on NWE's gas transmission system, is about 15 miles north of ML1. Cobb storage is about 3-to-4 billion cubic feet, which is not sufficient to reliably provide the quantity of fuel needed by the new facility.

Electrical transmission is limited, with only one 115 kV transmission line connecting south to the congested portion of NWE's system in Great Falls. The Cut Bank area is at the radial limit of NWE's electrical transmission system. Development of a plant site at Cut Bank would only be feasible with access to the new MATL 230 kV transmission line.

A major east-west rail line is adjacent to the site. The current ML1 facilities obtain needed water from a 3-inch water line, which has limited capability to support power plant development. Likely water sources are development of wells for groundwater or surface water from the Marias River, about eight miles south of the site.

The proposed site is an existing utility development with existing permitting and environmental control plans. The Blackfeet Indian Reservation is about five miles west of the site. Glacier National Park is about 60 miles to the west. Fuel gas supply is questionable and the site is remote on the electrical transmission system. Overall, negative attributes of this site make it unfavorable for consideration for development at this time.

### **Missoula**

The former Smurfit/Stone container factory site west of Missoula was considered. The factory buildings are currently under demolition. The status of underground facilities and potential contamination is not known. Fuel gas is available; NWE's 12-inch line flowing gas from Cut Bank through the Helena area runs to the Missoula area. As for any site south of Augusta, substantial line and/or compression upgrades are needed for the additional necessary gas transmission capability.

Electrical transmission is constrained in the Missoula area, with existing 100 kV and 161 kV lines. The 230 kV line in the area is BPA. Rail service is available at the site and there is hardtop road access from Interstate 90. Although the area immediately surrounding the site is light industrial, housing is being developed nearby. Water supply would be from the Clark Fork River and rights to 25 million gallons per day are included with the property.

The Missoula area is a more populated area and home to the University of Montana. There may likely be resistance to development of a new power plant. A site in the Missoula area is considered not likely permissible in a timely manner. Based on the lack of significant site attributes in the context of the limited scope of this initial screening, a plant site at Missoula is considered not attractive for further consideration at this time.

### **SilverBow**

The area of interest is the Silicon Mountain Technology Park, an industrial park 5 miles west of Butte at I-90 and I-15, east of Ramsey. Fuel gas is available in the area from NWE's 16-inch

line. As for any site south of Augusta, substantial line and/or compression upgrades are needed for the necessary additional gas transmission capability.

Electrical transmission is available, with 100 kV lines nearby and 230 kV Mill Creek-Wilsall line in the area. However, recent applications have added to the queue complicating interconnection to the system. Rail service is available; a rail yard/ inter-modal facility is located at the north end of the industrial park. Water supply is available from the nearby Silver Lake water pipeline.

The proposed power plant is consistent with the area's existing industrial facilities. The potential site is just west of Butte and its potential regulatory issue regarding compliance for PM<sub>10</sub> air-borne particulate. Positive attributes of this site make it favorable for consideration for development.

### **Telstad/Shelby**

The proposed plant site would be on NWE's land at its natural gas system Telstad compressor station, located about 15 miles east of Shelby. NWE owns the property at the station site. Fuel gas is available in the area from NWE's system, with connections to the Cobb Storage and the Aden Canadian gate. However, the available supply is currently not sufficient for the size of the planned generating facility and substantial line and/or compression upgrades are needed for the necessary additional gas transmission capability.

Electrical transmission is limited through REA lines connecting to NWE's 115 kV transmission line connecting south to the congested portion of NWE's system in Great Falls. The Shelby area is at the radial limit of NWE's electrical transmission system. Development of a plant site at Telstad would only be feasible with access to the new MATL 230 kV transmission line.

The site is located approximately one mile north of U.S. Route 2. A major east-west rail line is adjacent to the highway. The source of water for the existing facilities was not determined. Likely water sources are development of wells for groundwater.

The proposed site is an existing utility development with existing permitting and environmental control plans. The Blackfeet Indian Reservation is about 35 miles west of the site. Glacier National Park is about 90 miles to the west. Fuel gas supply is questionable and the site is remote on the electrical transmission system. Overall, negative attributes of this site make it unfavorable for consideration for development at this time.

### **Warren**

A site in the Warren area was considered because of the confluence of major gas pipelines in the area, about 60 miles south of Billings. Gas pipelines of Colorado Interstate Gas, Williston Basin Interstate, and Energy West Resources are in the area. Although a specific site was not identified, the area is generally agricultural and sufficient land should be available. U.S. Route 310 runs through the area and the railroad parallels the highway.

The only significant electrical transmission in the area is the REA lines connecting to the Yellowtail Dam, approximately 50 miles to the northeast in the Crow Indian Reservation.

There are no known industrial developments in the area. The Crow Indian Reservation and the Bighorn Canyon National Recreational Area are 10 miles to the east, and Yellowstone National Park is approximately 60 miles southwest of the site. Based on the area attributes in the context of the limited scope of this initial screening, a plant site at Warren is considered attractive for further consideration for development.

## **SITE SCREENING METHODOLOGY**

The following discussion explains the rationale and methodology applied to conduct both the initial and final screening of considered sites.

Comparative evaluation of prospective sites was conducted using a weighting summation technique to express the consistent comparative rating of the sites based on technical, environmental, permitting, and cost characteristics (“criteria”). The method includes numerical representations of both the magnitude of potential impact of the site characteristic and the relative importance of such characteristic.

The weighting summation model is comprised of 1) quality factors (“scores”) to express the magnitude of the site criteria and 2) weighting factors to indicate relative criteria importance. Quality factors (QF) are assigned a range of value from “1” (complications for site development = impact) to “5” (favorable development conditions = benefit). Weighting factors (WF) are assigned such that the sum of all criteria weighting factor is 100. Thus, for each selection category (or site characteristic) a rating is derived by application of quality factors and weighting factor as follows:

$$\text{Rating} = \text{WF} \times \text{QF}$$

The rating for each category is summed to obtain the total weighted rating for a considered site to directly compare to the corresponding ratings of other sites. The result of the process is that sites with higher total weighted rating are considered more favorable for development.

The team for the site evaluation remained the same throughout the initial screening and final screening and consisted of engineering technical personnel and environmental/permitting staff. Through team discussion, weighting factors for the selection categories and assigned scores (quality factors) were determined by consensus.

## **INITIAL SITE SCREENING**

The above describes the general approach and method for evaluation of sites. The following discussion addresses the specifics of the initial site screening. This high-level screening was conducted to identify a short-list of attractive potential sites to consider in more detail to determine the preferred site.

### **Selection Categories**

For the initial screening and comparison of the fifteen sites, seven basic selection categories were considered, as presented below. These categories are considered basic attributes for the site of the proposed power plant.

<b>Selection Category/ Criteria</b>	<b>Considered Aspects</b>
System electric transmission	Transmission congestion, available system facilities, potential cost of necessary system upgrades, extent of queue & likelihood for timely interconnection.
Gas supply	Availability of gas, available system facilities, potential cost of necessary system upgrades, existing queue for interconnection.
Water supply	Availability of supply facilities and sufficient water quantity.
Air quality issues	Consideration of non-attainment & Class 1 areas and high terrain near the site; availability of meteorological and air quality data.
Local Stakeholder Support	Consideration of the position of local governments, the public and special interests in the area.
Land Use/Setting	Site ownership and use/ setting; potential impact to historic/ cultural/ archeological resources.
Constructability	Site size, type of terrain and availability of roads and rail facilities.
Ecology	Adjacent land use, basic environmental aspects for potential impact, including wetlands, wildlife, threatened & endangered species.

### Weighting Factors

For the initial screening, weighting factors are as follows. These were derived via team discussion and consensus.

<b>Selection Category/ Criteria</b>	<b>Weighting Factor</b>
System electric transmission	20
Gas supply	20
Water supply	15
Air quality issues	15
Local stakeholder support	5
Land use/ setting	10
Constructability	5
Ecology	10
Total	100

## Site Visits

Site visits were an important part of the evaluation and comparison process. This provided the team a basic understanding of the prospective site setting, location, adjacent land uses, available facilities, and potential impacts or benefits of the sites.

Site visits were made as follows:

SITE	DATE
Anaconda (existing Mill Creek site)	April 18,2013
Big Sandy (Verona sub)	April 17, 2013
Billings Area	April 15, 2013*
Corette	April 15, 2013
Dry Creek Storage	April 15, 2013
Great Falls/ MFM	April 16, 2013
Havre Pipeline	April 17, 2013 *
Helena	Not visited
Highwood	April 16, 2013
Kalispell	Not Visited
Main Line 1 / Cut Bank	April 17, 2013
Missoula	April 18, 2013
Silver Bow	April 18, 2013
Telstad/Shelby	April 17, 2013
Warren	April 15, 2013 *

\*The team was in the area, but did not identify or visit a specific site.

## Quality Factors

For the initial screening of the fifteen sites, quality factors (scores) were assigned for the eight selection categories based on available information including that derived from site visits. These quality factors range from 1 (complications for development) to 5 (favorable for development). The results of the initial site screening are presented in a matrix in Attachment 2. This shows the assigned quality factors for each selection category for each considered site.

## Results of Initial Site Screening

In Attachment 2, the matrix of the initial screening results shows the resulting rating for each category on the basis of applying the weighting factor and quality factor, and finally, the total weighted rating for each prospective site.

The results of initial site screening of the fifteen sites are as follows:

<b>Considered Site</b>	<b>Total Weighted Rating</b>
Anaconda (existing Mill Creek site)	390
Big Sandy (Verona sub)	270
Billings Area	390
Corette	400
Dry Creek Storage	280
Great Falls/ MFM	325
Havre Pipeline	280
Helena	230
Highwood	355
Kalispell	245
Main Line 1 / Cut Bank	290
Missoula	275
Silver Bow	370
Telstad/Shelby	300
Warren	360

Based on the highest scores (weighted ratings), the following five sites were identified for further evaluation in additional detail to determine the preferred site for NWE’s new system power plant.

- Anaconda/Mill Creek
- Billings Area
- Corette
- Silver Bow
- Warren

### **FINAL SCREENING OF SHORT-LISTED SITES**

The five short-listed sites identified in the initial screening process were evaluated on the basis of an expanded, more detailed set of criteria for the final screening. These final screening criteria include eleven categories, covering a total of 37 criteria items. These criteria are defined in the site selection worksheet in Attachment 3. Five categories address technical issues, including pertinent relative costs. These technical categories cover 57 percent of the overall criteria weighting. Four categories address air quality, environmental, and permitting aspects and likewise cover 36 percent of the overall criteria weighting. Two categories address local issues, stakeholder support and work force availability and cover seven percent of the overall criteria weighting.

The 37 selection criteria and corresponding weighting are listed in the final screening matrix in Attachment 4. Also, shown are the assigned quality factors for each criteria item and the resulting ranking (score). These scores are summed to derive the total weighted rating for each of the five sites, as a basis for comparison and identification of the preferred site.



The existing Corette site has the highest score which is 379 and is 76 percent of a possible score of 500, followed by the Anaconda/Mill Creek site that is the location of the existing Dave Gates Generating Station with a score of 362 and 72 percent. Both of these sites accrue significant advantage in the permitting area because they have existing permits to serve as the basis for permitting a new facility as well as existing infrastructure to support construction.

Corette, however, has a number of complications, including above ground and underground hazardous materials, uncertain property acquisition costs, and its location adjacent to the Yellowstone River, a popular recreation area. The Corette plant is now open cycle cooled with water directly from the Yellowstone River. Given current environmental policy, it is highly unlikely that this type of cooling would be allowed for a new plant. Thus, cooling for the new plant is assumed to be closed cycle cooling towers. The scoring assumes that, based on the permits for the existing plant, makeup water from the Yellowstone River can be permitted along with appropriate waste water discharges.

Mill Creek has notable positive attributes including access to electrical transmission grid, land type and setting, and water supply. However, relatively expensive upgrades to the electrical and gas transmission systems would be required to accommodate the anticipated generating capacity.

## **CONCLUSION**

As discussed above, the final screening indicates that the highest score is for the existing Corette site. However, a more complete investigation of the environmental concerns is recommended before proceeding with this site. Mill Creek has fewer environmental complications and is a good alternative site for development of NWE's proposed power plant.

# ATTACHMENTS

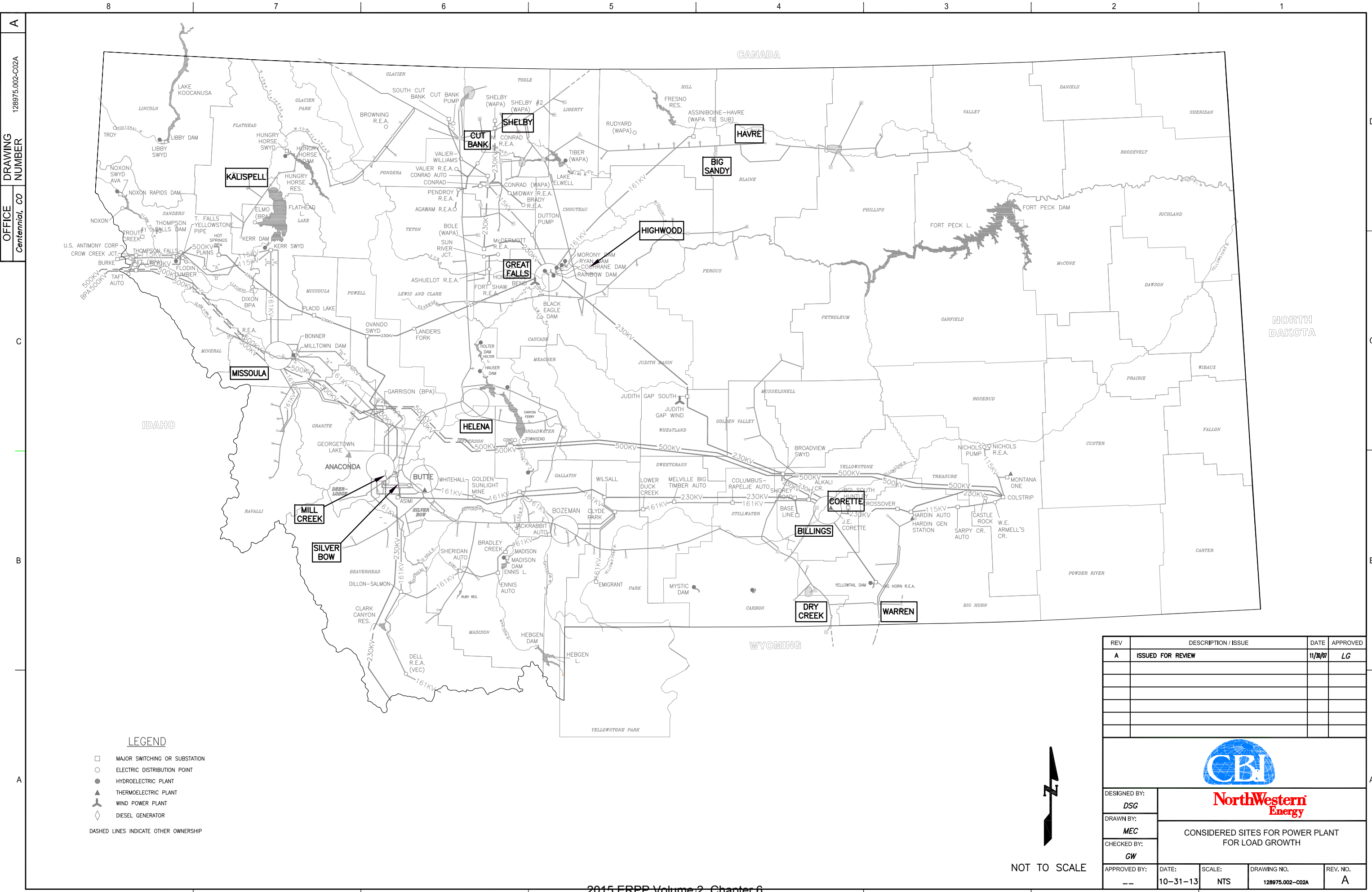




# ATTACHMENT 1

## Location of Considered Sites for Power Plant for Load Growth





OFFICE: Centennial, CO  
 DRAWING NUMBER: 128975.002-C02A

**LEGEND**

- MAJOR SWITCHING OR SUBSTATION
- ELECTRIC DISTRIBUTION POINT
- HYDROELECTRIC PLANT
- ▲ THERMOELECTRIC PLANT
- ▲ WIND POWER PLANT
- ◇ DIESEL GENERATOR
- DASHED LINES INDICATE OTHER OWNERSHIP

REV	DESCRIPTION / ISSUE	DATE	APPROVED
A	ISSUED FOR REVIEW	11/30/07	LG



**NorthWestern Energy**

DESIGNED BY:  
DSG  
DRAWN BY:  
MEC  
CHECKED BY:  
GW

CONSIDERED SITES FOR POWER PLANT FOR LOAD GROWTH

APPROVED BY:	DATE:	SCALE:	DRAWING NO.	REV. NO.
--	10-31-13	NTS	128975.002-C02A	A

NOT TO SCALE

# ATTACHMENT 2

## Initial Site Screening Matrix



**Site Selection: Initial Screening**  
**NorthWestern Energy Combined Cycle Project**

Attachment 2

Final 2/5/14

**EVALUATION MATRIX**

No.	Selection Category/Criteria	Site	Anaconda/ Mill Creek		Big Sandy/Vernoa		Billings Area		Corette		Dry Creek Storage		Great Falls / MFM		Havre Pipeline		Helena		Highwood		Kalispell		Main Line 1/ Cut Bank		Missoula		Silver Bow		Telstad / Shelby		Warren	
			WF	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF	Total Rating	QF
1	<b>System Electric Transmission</b>	20	4	80	2	40	5	100	5	100	2	40	3	60	2	40	2	40	3	60	2	40	2	40	3	60	4	80	3	60	3	60
	Degree of Transmission Congestion																															
	Availability																															
2	<b>Gas Supply</b>	20	2	40	2	40	4	80	4	80	4	80	2	40	2	40	2	40	2	40	2	40	3	60	2	40	2	40	2	40	4	80
	Amount of Gas Available																															
	Distance/Ownership																															
	Availability/ Access to Backup Fuel Source																															
3	<b>Water Supply</b>	15	4	60	2	30	3	45	4	60	2	30	4	60	3	45	3	45	3	45	4	60	2	30	5	75	5	75	2	30	3	45
	Water Supply Availability																															
	Water Quantity																															
4	<b>Air Quality Issues</b>	15	4	60	4	60	3	45	4	60	3	45	4	60	3	45	2	30	5	75	2	30	3	45	2	30	3	45	3	45	4	60
	Non-Attainment Area																															
	Class 1 Area																															
	Nearby High Terrain																															
	Availability of Meteorological & Air Quality Data																															
5	<b>Local Stakeholder Support</b>	5	5	25	4	20	4	20	5	25	3	15	3	15	4	20	1	5	4	20	2	10	4	20	2	10	5	25	4	20	4	20
	Government																															
	Public																															
	Special Interests																															
6	<b>Land Use/Setting</b>	10	5	50	3	30	4	40	3	30	3	30	4	40	3	30	3	30	5	50	3	30	3	30	1	10	4	40	4	40	4	40
	Type of Ownership/Land Use																															
	Historic/ Cultural/ Archeological Resources																															
7	<b>Constructability</b>	5	5	25	4	20	4	20	3	15	2	10	4	20	4	20	4	20	3	15	3	15	5	25	4	20	5	25	5	25	3	15
	Size																															
	Terrain																															
	Highway																															
	Railroad																															
8	<b>Ecology</b>	10	5	50	3	30	4	40	3	30	3	30	3	30	4	40	2	20	5	50	2	20	4	40	3	30	4	40	4	40	4	40
	Adjacent Land Use																															
	Wetlands																															
	Threatened & Endangered Species																															
	<b>Total Weighted Rating</b>	100		<b>390</b>		<b>270</b>		<b>390</b>		<b>400</b>		<b>280</b>		<b>325</b>		<b>280</b>		<b>230</b>		<b>355</b>		<b>245</b>		<b>290</b>		<b>275</b>		<b>370</b>		<b>300</b>		<b>360</b>
	<b>Rank</b>			<b>2</b>		<b>13</b>		<b>2</b>		<b>1</b>		<b>10</b>		<b>7</b>		<b>10</b>		<b>15</b>		<b>6</b>		<b>14</b>		<b>9</b>		<b>12</b>		<b>4</b>		<b>8</b>		<b>5</b>

Weighting Factor (WF) is the category associated with relative importance or significance of impacts  
Quality Factor (QF) = expression of the magnitude of impacts based on rating between 1 to 5  
5 = favorable development conditions  
1 = complications for site development

# ATTACHMENT 3

## Site Selection Worksheet – Final Screening Criteria



<b>Site: X</b>
<b>Location:</b>

**1. System Electric Transmission**

1A **Degree of Transmission Congestion**

5	4	3	2	1
very low	low	average	high	very high
Comment:				

1B **Cost to Rectify Transmission Congestion**

5	4	3	2	1
very low \$10M	low	average \$50 M	high	very high > \$100 M
Comment:				

1C **Access to Transmission Grid**

5	4	3	2	1
very good	good	average	poor	very poor
Comment:				

1D **Cost to Access Transmission Grid**

5	4	3	2	1
very low \$10M	low	average \$50 M	high	very high > \$100 M
Comment:				

**2. Fuel Supply**

2A **Amount of Gas Available (direct supply or transmission impact)**

5	4	3	2	1
very high	high	average	low	very low
Comment:				

2B **Cost to Rectify Gas Supply**

5	4	3	2	1
very low \$10M	low	average \$50 M	high	very high > \$100 M
Comment: \$5 to \$6 per [mmBtu]				

2C **Cost to Rectify Gas Transmission**

5	4	3	2	1
very low \$10M	low	average \$50 M	high	very high > \$100 M
Comment:				



<b>Site: X</b>
<b>Location:</b>

2D	<b>Need for Backup Fuel</b>				
	5	4	3	2	1
	very low	low	average	high	very high
	Comment: Based on probability of interruption				

### 3. Local Stakeholder Support

3A	<b>Government</b>				
	5	4	3	2	1
	supportive	high	neutral	low	opposed
	Comment:				

3B	<b>Public</b>				
	5	4	3	2	1
	supportive	high	neutral	low	opposed
	Comment:				

3C	<b>Special Interests</b>				
	5	4	3	2	1
	supportive	high	neutral	low	opposed
	Comment:				

### 4. Land Ownership

4A	<b>Type of Ownership</b>				
	5	4	3	2	1
	company	other private	local public	state/ federal	tribal
	Comment:				

4B	<b>Cost of Land Acquisition</b>				
	5	4	3	2	1
	very low < \$0.10 M	low	average \$ 0.20 M	high	very high > \$0.30 M
	Comment:				

### 5. Work Force Availability

5A	<b>Construction Work Force Availability</b>				
	5	4	3	2	1
	very high	high	average	low	very low
	Comment:				

5B	<b>Availability of O/M Personnel</b>				
	5	4	3	2	1



<b>Site: X</b>
<b>Location:</b>

very high	high	average	low	very low
Comment:				

## 6. Water Supply

6A **Water Supply Availability**

5	4	3	2	1
very high	high	average	low	very low
Comment:				
Industrial/Municipal:				
Well(s)				
other:				

6B **Cost of Developing/Operating Water Supply System**

5	4	3	2	1
very low < \$0.2 M	low	average \$ 5 M	high	very high > \$10 M
Comment:				

## 7. Transportation Infrastructure

7A **Roads**

5	4	3	2	1
public-4 lane	public-2 lane	public-gravel	private gravel	undeveloped
Comment:				

7B **Railroad**

5	4	3	2	1
adjacent	< 3 miles	within 10 mi	> 10 miles	not available
Comment:				

7C **Cost of Improving/Construction Transportation Access**

5	4	3	2	1
very low < \$5 M	low	average \$ 30 M	high	very high > \$ 100 M
Comment:				

## 8. Air Quality Issues

8A **Non-Attainment Area**

5	4	3	2	1
over 20 miles	15- 20 miles	10-15 miles	5 -10 miles	within 5 miles



<b>Site: X</b>
<b>Location:</b>

Comment: Butte = 20-25 miles

8B	<b>Class 1 Area</b>				
	5	4	3	2	1
	over 150 miles	100 - 150 miles	100 - 50 miles	50 - 25 miles	within 25 miles
Comment:					

8C	<b>Nearby High Terrain</b>				
	5	4	3	2	1
	over 10 miles	6 - 10 miles	4- 6 miles	2 - 4 miles	within 2 miles
Comment:					

8D	<b>Availability of Meteorological &amp; Air Quality Data</b>				
	5	4	3	2	1
	yes		some data		no*
Comment:					

\* 1 year data collection program needed

**9. Potential Environmental Issues**

9A	<b>Adjacent Land Use</b>				
	5	4	3	2	1
	non-productive	industrial	agricultural	recreation*	comm/resid
Comment:					

\* State/Federal Park or managed habitat area

9B	<b>Wetlands</b>				
	5	4	3	2	1
	no		within 3 mi	adjacent	on-site
Comment:					

9C	<b>Aesthetic (Visual) and Noise Impacts</b>				
	5	4	3	2	1
	very low	low	average	high	very high
Comment:					

9D	<b>Geotechnical (Foundation/ Soil) Issues</b>				
	5	4	3	2	1



<b>Site: X</b>
<b>Location:</b>

no	low	average	high	yes
Comment:				

9E	<b>Threatened &amp; Endangered Species</b>				
	5	4	3	2	1
	no	low	average	high	yes
Comment:					

9F	<b>Conflict with Historic/Cultural/Archeological Resources</b>				
	5	4	3	2	1
	very low	low	average	high	very high
Comment:					

9G	<b>Wastewater Disposal</b>				
	5	4	3	2	1
	limited treatment - municipal service	limited onsite treatment req'd.	extensive treatment - municipal	extensive onsite treatment	not available
Comment:					

9H	<b>Solid Waste Disposal</b>				
	5	4	3	2	1
	municipal service - pickup	landfill nearby-company transport	distant landfill-company transport	onsite disposal	not available
Comment:					

**10. Permitting Issues**

10A	<b>Major Facility Permit Required</b>				
	5	4	3	2	1
	less extensive		average		more extensive
Comment:					

10B	<b>Other Environmental Permit Required</b>				
	5	4	3	2	1
	less extensive		average		more



<b>Site: X</b>
<b>Location:</b>

			extensive
Comment/Permits:			

10C **Other Potentially Problematic Environmental Issues**

5	4	3	2	1
less extensive		average		more extensive
Comment:				

**11. Environmental Opportunities**

11A **Carbon Offsets**

5	4	3	2	1
at site	adjacent	in County	in Montana	nationally
Comment:				

11B **Other Forms of Environmental Remediation Available**

5	4	3	2	1
at site	adjacent	in County	in Montana	nationally
Comment:				



# ATTACHMENT 4

## Final Site Screening Matrix



Site Selection Final Screening											Attachment 4	
NorthWestern Energy Combined Cycle Project											Final - 2/5/14	
No.	Selection Criteria	Site	Mill Creek		Billings Area		Corette		Silver Bow		Warren	
		Weighting	QF*	Total Rating	QF*	Total Rating	QF*	Total Rating	QF*	Total Rating	QF*	Total Rating
<b>1</b>	<b>System Electric Transmission</b>	<b>20</b>										
1A	Degree of Transmission Congestion	6	2	12	4	24	4	24	2	12	4	24
1B	Cost to Rectify Transmission Congestion	4	2	8	4	16	5	20	2	8	4	16
1C	Access to Transmission Grid	5	4	20	4	20	5	25	4	20	2	10
1D	Cost to Access Transmission Grid	5	4	20	4	20	5	25	4	20	4	20
<b>2</b>	<b>Fuel Supply</b>	<b>19</b>										
2A	Amount of Gas Available (direct supply or transmission impact)	6	2	12	2	12	2	12	2	12	3	18
2B	Cost to Rectify Gas Supply	5	2	10	4	20	4	20	2	10	3	15
2C	Cost to Rectify Gas Transmission	4	1	4	4	16	4	16	1	4	5	20
2D	Need for Backup Fuel	4	3	12	4	16	4	16	3	12	5	20
<b>3</b>	<b>Local Stakeholder Support</b>	<b>5</b>										
3A	Government	2	5	10	4	8	4	8	5	10	4	8
3B	Public	1	5	5	3	3	4	4	5	5	4	4
3C	Special Interests	2	4	8	3	6	1	2	5	10	2	4
<b>4</b>	<b>Land Ownership</b>	<b>5</b>										
4A	Type of Ownership	2	5	10	4	8	4	8	4	8	4	8
4B	Cost of Land Acquisition	3	5	15	3	9	1	3	3	9	3	9
<b>5</b>	<b>Work Force Availability</b>	<b>2</b>										
5A	Construction Work Force Availability	1	4	4	5	5	5	5	4	4	2	2
5B	Availability of O/M Personnel	1	5	5	5	5	5	5	5	5	1	1
<b>6</b>	<b>Water Supply</b>	<b>8</b>										
6A	Water Supply Availability	4	4	16	4	16	5	20	5	20	4	16
6B	Cost of Developing/ Operating Water Supply System	4	5	20	2	8	4	16	4	16	2	8
<b>7</b>	<b>Transportation Infrastructure</b>	<b>5</b>										
7A	Roads	2	4	8	5	10	5	10	5	10	4	8
7B	Railroad	1	5	5	3	3	5	5	4	4	3	3
7C	Cost of Improving/ Construction Transportation Access	2	5	10	3	6	5	10	4	8	3	6
<b>8</b>	<b>Air Quality Issues</b>	<b>10</b>										
8A	Non-Attainment Area	4	5	20	1	4	1	4	2	8	5	20
8B	Class 1 Area	3	1	3	3	9	3	9	3	9	3	9
8C	Nearby High Terrain	2	4	8	5	10	5	10	4	8	5	10
8D	Availability of Meteorological & Air Quality Data	1	3	3	4	4	4	4	3	3	1	1
<b>9</b>	<b>Potential Environmental Issues</b>	<b>17</b>										
9A	Adjacent Land Use	3	5	15	3	9	2	6	4	12	3	9
9B	Wetlands	2	5	10	3	6	5	10	3	6	3	6
9C	Aesthetic (Visual) and Noise Impacts	2	5	10	3	6	5	10	4	8	3	6
9D	Geotechnical (Foundation/ Soil) Issues	2	4	8	3	6	2	4	4	8	3	6
9E	Threatened & Endangered Species	3	5	15	3	9	5	15	3	9	3	9
9F	Conflict with Historic/ Cultural/ Archeological Resources	3	5	15	3	9	5	15	3	9	2	6
9G	Wastewater Disposal	1	5	5	3	3	4	4	3	3	1	1
9H	Solid Waste Disposal	1	4	4	4	4	4	4	4	4	3	3
<b>10</b>	<b>Permitting Issues</b>	<b>6</b>										
10A	Major Facility Permit Required	1	4	4	2	2	4	4	2	2	2	2
10B	Other Environmental Permit Required	3	4	12	2	6	4	12	2	6	2	6
10C	Other Potentially Problematic Environmental Issues	2	5	10	3	6	4	8	3	6	3	6
<b>11</b>	<b>Environmental Opportunities</b>	<b>3</b>										
11A	Carbon Offsets	2	2	4	2	4	2	4	2	4	2	4
11B	Other Forms of Environmental Remediation Available	1	2	2	2	2	2	2	2	2	2	2
	<b>Total Weighted Rating</b>	<b>100</b>		<b>362</b>		<b>330</b>		<b>379</b>		<b>314</b>		<b>326</b>
	*QF= Quality Factor, expression of the magnitude of impacts based on rating between 1 and 5.											