

**EXHIBIT NO. ____ (RJR-20)
DOCKETS UE-17 ____ /UG-17 ____
2017 PSE GENERAL RATE CASE
WITNESS: RONALD J. ROBERTS**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

Docket UE-17 ____

Docket UG-17 ____

**NINETEENTH EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF**

RONALD J. ROBERTS

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 13, 2017



Privileged Attorney-Consultant Communication Prepared in Anticipation of Litigation and Trial

January 15, 2014

Perkins Coie
1201 Third Avenue, Suite 4900
Seattle, WA 98101-3099

Puget Sound Energy-Colstrip
B&V Project 181811
B&V File 45.0000

Attention: Mark Schneider, Attorney

Subject: Phase 2 Cost Estimate

Black & Veatch was engaged to refine the order of magnitude cost estimates for two decommissioning and closure scenarios for Puget Sound Energy's (PSE) Colstrip Power Plant¹ originally provided in our draft letter report dated November 8, 2013.

The Colstrip Power Plant consists of four coal fired generating units, with associated auxiliary and air pollution emission control equipment, located 120 miles east of Billings, Montana. The units receive western sub-bituminous coal from the adjacent Rosebud Mine. Units 1 and 2 began commercial operation in the mid-1970's and Units 3 and 4 in the mid-1980's.

The three scenarios included in the Phase 1 letter report are described below. At Perkins Coie direction, only the costs associated with Scenarios 2 and 3 have been refined.

- Scenario 1 - The retirement and permanent shutdown of Units 1 and 2 in place with no consideration of environmental mitigation. This activity considered isolation of the Unit 1 and 2 equipment and buildings from the remaining plant and only included those major components such as the Unit 1 and 2 boilers, steam turbines, coal handling system, air quality controls and stacks, and cooling towers. Typical shutdown activities were assumed including in the cost estimate as well as the installation of a security fence around this equipment. Impoundments and other areas and equipment outside of the Unit 1 and 2's physical equipment location were not considered. It was assumed Units 3 and 4 remain in service.
- Scenario 2 - Retirement and decommissioning of Units 1 and 2 by demolition to plant grade and applying best industry practices for returning this plant area to natural conditions. This scenario did not consider potential environmental mitigation.

¹ This phase 2 retirement, decommissioning, and demolition study is not intended to be, and should not be construed as, advice concerning legal obligations or a recommendation concerning the timing, scope or necessity to conduct any related activity. This report was prepared for Perkins Coie on behalf of PSE by Black & Veatch. Limited information in the form of Engineering Data Manuals and miscellaneous architectural and engineering drawings was supplied as a basis for this project and a site visit was not performed. Black & Veatch has assumed that the limited information, both verbal and written, provided by others is complete and correct without independent verification. Black & Veatch does not guarantee the accuracy of the information, data, or opinions contained herein.

Impoundments and other areas and equipment outside of the Unit 1 and 2's physical equipment location were not considered. Units 3 and 4 remain in service.

- Scenario 3 - Retirement and decommissioning of Units 3 and 4 by demolition to plant grade and applying best industry practices for returning this plant area to natural conditions. This scenario did not consider potential environmental mitigation. Impoundments and other areas and equipment outside of the Unit 3 and 4's physical equipment location were not considered. Scenario 3 considers that Units 1 and 2 along with their associated equipment have already been removed (Scenario 2). It was assumed the 230 kV and 500 kV switchyards would remain in service at the site.

PROJECT APPROACH AND ASSUMPTIONS

Black & Veatch's Phase 2 approach to estimate these costs was based on the use of a proprietary estimating spreadsheet developed for previous coal fired generating station decommissioning and demolition studies. Where possible, configuration and quantity data from Colstrip Engineering Data Manuals, drawings, and other technical resources provided by Colstrip Plant staff was used to populate the spreadsheet. When site specific data was not available, typical data was supplemented from Black & Veatch in-house databases and information from previous projects. A site visit was not conducted to support this effort. A set of decommissioning assumptions were assumed based on a brief conference call held on October 22, 2013 as part of the Phase 1 estimating process. These discussions focused on safety and security requirements, known hazardous materials that would be encountered during demolition, scenario definitions, and final site condition requirements.

For purposes of the PSE estimate, Black & Veatch assumed shutdown of the units based on their current configuration and that costs associated with abatement of hazardous materials and environmental remediation of ash ponds, landfills, coal yard, and other impoundments and the associated costs with potential closure of the Rosebud mine and land reclamation activities will be provided by others. Future unit modifications that may be mandated by environmental regulations such as the installation of Selective Non-Catalytic Reduction (SNCR) technology are not included. Other general assumptions made for this cost estimate include the following:

General Assumptions

- This is an order of magnitude cost estimate.
- Economic assumptions are based on regional cost estimates expressed in 2014 dollars and do not include escalation.
- Information supplied by PSE was limited. Therefore, efforts were focused on identification of data for Units 1 and 3 and these results applied to Units 2 and 4 as they are similar.
- The decommissioning cost estimates are based on an EPC contracting approach.
- Does not take into account any future capacity needs requirements.
- The generating units to be decommissioned and demolished will be placed in a safe and secure condition with no effort to preserve the equipment for later return to service or sale of equipment on the grey market.
- Essential safety and support equipment will remain in service until scheduled for removal.

- Nonessential equipment and systems will be prepared for permanent shutdown and removal.
- The transmission system, including the 230 kV and 500 kV switchyards, will remain intact and are not part of this analysis.
- The cost estimate is primarily based on a dismantling method that utilizes torches, shears, and other heavy equipment rather than generally utilizing explosives. Explosives may be used where applicable and feasible to demolish stacks, foundations, and/or selected concrete pedestals to grade.
- The Plant has sufficient lay down areas for staging demolition equipment, contractors' trailers, and temporary storage and breakdown of demolished materials.
- Removal or backfilling of underground piping, subsurface structures, and electrical vaults were not considered.
- The river pump station, associated water pipes between the river and reservoir, associated water pipes to Colstrip, and other associated equipment will remain in service. O&M costs were not included.
- The estimate assumes that all scrap metal, such as: structural steel, miscellaneous steel, conduit, cable, piping, valves and equipment, will be cut to size on site for transporting in roll-off containers and 40' trailers. Costs for transportation are included in the scrap unit pricing in 2014 dollars. Actual scrap prices are subject to change based on market conditions.
- All equipment is considered for scrap value only; no equipment salvage values are utilized. No re-sale or reuse of the plant components was considered.
- Where possible, nonhazardous, non-salvageable materials from the decommissioning and demolition activities will be disposed of at the Rosebud mine. Costs have been included to hauling of materials to the coal mine.
- Other non-hazardous materials which cannot be placed at the mine will be transported to an approved local landfill. Black & Veatch assumed approximately 5 percent of the demolition materials were disposed of in a local landfill.
- Concrete and asphalt materials were not used as on-site backfill material.
- As part of the demolition to grade activities, asphalt roadbeds and parking areas will be removed from areas around the Admin building, power block, and parking areas and backfilled with off-site material.
- All materials and equipment used to operate the Colstrip units will be removed by PSE and associated costs or revenue are not included in the estimate. These include:
 - Plant operating fuels (coal, fuel oil, gasoline, etc.).
 - Chemicals
 - Lime, limestone, and associated residue, etc.
 - Fluids in tanks, pipes, barrels, storage areas, and other container and media.
 - Spare parts, tools, etc.
 - Any radioactive equipment at Colstrip.
 - All mobile equipment and vehicles (i.e., graders, dozers, haul trucks, passenger vehicles, etc.).
- Disposal of office furniture, office equipment, and spare parts inventory are not included.
- The estimate assumes that all plant systems will be de-energized, drained and tagged-out of service by the owner(s).

- Construction power and potable and non-potable water is assumed to be available at the site boundary and provided by PSE for decommissioning activities.
- For engineering, design, additional investigations and studies, light construction activities, and other activities supporting the three decommissioning and demolition scenarios, \$1,000,000 has been included in each cost estimate.
- This study focuses on capital expenditures for the various decommissioning and demolition scenarios. No costs have been included for the long-term site monitoring, security, environmental monitoring, and other operating & maintenance (O&M) expense.
- Plant insurance costs and property taxes were not included.

Scenario 2 Assumptions

- Barriers will be installed as required to control access to the decommissioned units during demolition. This includes a 8 ft. security fence around portions of the Unit 1 and 2 area.
- Demolition of the Unit 1 & 2 Surface Paste Plant and cooling towers is included in the cost estimate. Demolition of other support buildings such as shops and warehouses not specifically dedicated to Units 1 & 2 will remain in place to support operation of Units 3 & 4.

Scenario 3 Assumptions

- In the future PSE and the other Owners will retain ownership of the site. No additional agreements exist which would define the physical or topographic condition of the area upon full decommissioning and that no additional requirements exist beyond those that may be present in current plant permits.
- It is assumed the land will be restored to a condition which could be used for light surface application. Costs to remediate the coal yard, landfills, ponds, or other potential areas of surface or subsurface contamination are not included in this estimate.
- The owners of the site will be good neighbors and reasonably eliminate or minimize any dangerous conditions at the site. An 8 ft. security fence will be installed around portions of the Unit 3 and 4 area and will extend the existing Unit 1 and 2 area fence.
- Costs for long term site monitoring and security are not included in the estimate.

COST

The decommissioning and demolition costs provided below were based on limited information provided by PSE and supplemented with Black & Veatch estimate data for similar type and size units. Salvage value estimates are based on typical salable materials and estimate quantities. Decommissioning costs and salvage values are presented in 2014 dollars. Table 1 summarizes the estimated decommissioning and demolition costs for the scenarios. These costs include 10 percent contingency to capture those unforeseen project costs not identified within this study.

Table 1 Cost Summary

SCENARIO	NET RATING OF RETIRED UNITS	ESTIMATED PROJECT DECOMMISSIONING COST WITH MATERIAL SALVAGE
	MW	\$/MW
Scenario 2	614	81,000
Scenario 3	1,480	75,000
Notes:		
<ol style="list-style-type: none"> 1. Owner indirect administrative and general costs estimated at 5.0% and have been included in the above costs. 2. The cost to decommission and close the adjacent mine and associated impoundments are not included in this study. 3. \$/MW values are based on the net unit ratings. 4. Costs are provided in 2014 dollars. 		

SPECIAL CONSIDERATIONS

Several special considerations could alter these estimated decommissioning costs, including on-site investigation, identification of actual Colstrip equipment and material weights, constructability challenges, changes in environmental legislation, changes in economic considerations such as labor rates, demolition costs, or scrap values, changes in ash disposal regulations/methods, costs for hazardous materials abatement, changes in contracting methodology, allocations for engineering and construction management, and project contingency costs, changes to the location demolition materials are disposed, changes in pond/impoundment closure requirements, or a change in the future use of the site.

Black & Veatch appreciates the opportunity to assist PSE in this important project and look forward to assisting PSE further in the future. Please feel free to contact me if you have any questions or require additional information at 913-459-9062 or lucaskj@bv.com.

Very truly yours,

BLACK & VEATCH Corporation

Kyle Lucas

Kyle Lucas
Project Manager

kjl
Enclosure[s]

cc: Ed Odom - PSE
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