OTTER CREEK COAL
EXHIBIT 322A: COAL CONSERVATION

1.0 Introduction

This exhibit addresses the requirements of ARM 17.24.322(2), which prescribes the requirements for a coal conservation plan. The performance standards of ARM 17.24.523 and 763 are addressed.

2.0 Geologic Information

Fifty-five stratigraphic and core holes were drilled in the prospective mining area of Tract 2. Drill hole locations are shown on Map 15 - Drill Hole Locations; lithologic logs and geophysical logs are in Baseline Reports 304F and 304G, respectively. Analysis data for overburden samples are included in Baseline Report 304H. Geologic cross-sections are included as Map 16 - Geologic Cross Sections.

Geologic information required by ARM 17.24.322(2)(a) is addressed below.

2.1 Stratigraphy

The only coal seam of economic interest on the Otter Creek coal tracts is the Knobloch coal seam. The Knobloch ranges from 59 to 72 feet in thickness; the typical coal thickness on Tract 2 is 70 feet. In the prospective mining area, the Knobloch is present as a single seam in approximately the northern half. In the southern half the seam splits into the "Upper" and "Lower" Knobloch with a parting trending to 60 feet or greater at the southern mining limit. In this area the Upper Knobloch (UK) splits again forming the Lower Upper Knobloch (LUK), the Upper Upper Knobloch (UUK) and two additional minor splits. Splitting and thinning of the seam(s) in the extreme south of Tract 2 precludes economic mining in this area. In addition, the Upper Knobloch is burned out in much of the southern part of Tract 2.

The coal seam is generally flat lying with an upward structural trend to the south in the area of the splits. There is a structural low at about the center of Tract 2, with a gentle upward trend to the North. Structure on the bottom of the Knobloch seam is shown on Plate 1.

The Knobloch is burned out in the northwestern portion of Tract 2 (Section 10), with an area of partial burn to the south adjacent to Otter Creek in Section 15. Tracts 1 and 3 also have significant areas of burn along Otter Creek and its tributaries Threemile and Home Creeks.

At higher elevations scoria remnants indicate additional coal seams which are likely thin and of poor quality. There are no drill holes at the higher elevations due to lack of vehicle access without substantial road building.

On Tract 2, overburden thickness ranges from 90 feet to more than 400 feet at higher elevations adjacent to the Custer National Forest (CNF) to the east as shown on Plate 2. The economic mining limit generally is about 250 feet of overburden, although small areas of higher overburden are included in the mine plan to square it up and maximize recovery. The overburden is primarily composed of siltstone/shale/ mudstone, with discontinuous sandstone zones in some areas. The underburden is typically a shale or mudstone.

2.2 Coal Reserves

Total coal reserves in the permit area are estimated at 654 million tons based on geologic modeling using Mincom software. Of this total, 356 million tons are within the planned mining area.

2.3 Geologic Cross-Sections

Geologic cross-sections are shown on Map 16. The cross-sections depict the geologic makeup beneath the surface of the area of the Otter Creek coal tracts, including the area to be mined. The thickness and geological character of all known strata is represented, from the surface to the underburden.

2.4 Test Borings

Elevations and locations of drill holes are shown on Map 15 - Drill Hole Locations.

2.5 Isopach Maps

An isopach map of the overburden is included as Plate 2. Additional isopach maps of the Knobloch, interburden or underburden are available upon request.

2.6 Coal Quality

The Knobloch coal on Tract 2 is a very low sulfur subbituminous C rank coal. Overall proximate analysis is 27.4 percent moisture, 6.0 percent ash, 0.18 percent sulfur and 8686 Btu/lb, and is reasonably consistent. Sodium oxide content of ash is variable and averages 8.29 percent. Table 1 shows quality by seam including short proximate, sodium oxide content of ash, forms of sulfur and trace elements.

2.7 Crop Lines

There are no crop lines; the Knobloch coal partially subcrops along and under portions of the Otter Creek and Threemile Creek valleys where the coal is not burned. Burn lines and structure are shown on Plate 1.

2.8 Abandoned Mines

There are no known workings of active, inactive or abandoned underground mines or previously strip mined areas in or near the proposed mine plan, or anywhere on the Otter Creek coal tracts.

3.0 Coal Recovery

Plate 3 shows the mining area and the locations and quantities of coal to be mined and left unmined within the permit area, and the reasons why the coal will not be mined. Anticipated coal recovery is 90 percent, with an estimated 320 million tons to be mined. The reasons for non-recovery and the tonnages of coal involved are discussed below.

3.1 Hydrologic Balance Protection

Coal in polygons 1-10 on Plate 3 will be left in place for hydrologic protection in order to comply with the Act. The mine plan incorporates a barrier of unmined coal to be left in place along the valleys of Otter Creek and Threemile Creek, and along the burn line. The purpose is two-fold:

- To moderate back flow of ground water from the alluvium and clinker into the pit, thereby minimizing temporary water level draw downs and pit dewatering requirements.

- To moderate and approximate pre-mining flow of ground water from the replaced spoils to the alluvium and clinker after mining and reclamation is complete and ground water is re-established in the mined area.

The amount of coal affected is an estimated 142.4 million tons in place, or 128.2 million potentially recoverable tons. It should be noted that along the alluvial subcrop and burn lines the coal is likely oxidized, so much of the coal affected would be of substandard quality.

3.2 Custer National Forest/High Overburden

The east boundary of Tract 2 abuts the CNF, and a minimum buffer zone of 100 feet must be maintained. This buffer zone applies to surface disturbance. When the buffer limit is projected down to the top of the coal following the final highwall configuration a larger area of coal is excluded from mining. This is also a very high overburden area, most of which exceeds the economic overburden limit of 250 feet, or an in-place ratio of approximately 3.5 bank cubic yards (bcy):ton. Polygons 11 and 12 fall into this category; approximately 80.0 million tons in place, or 72.0 potentially recoverable tons are so affected.

3.3 Probable Washout, Burn and Coal Split

Polygons 13-15 lie along Otter Creek in an area where the Upper Knobloch is burned, washouts are probable along the creek margin, and the Upper Knobloch splits. The estimate of 12.0 million tons in place (10.8 million tons potentially recoverable) probably is high due to uncertainty of subsurface conditions. This area would not be mineable due to hydrologic protection considerations in any case.

3.4 High Overburden/Coal Splits

Polygon 16 lies along the southern limit of the mine plan in the area where the Upper Knobloch splits into four separate seams, two of which are quite thin. Much of this area has high overburden, and it also lies along the CNF boundary. The amount of coal affected is an estimated 42.8 million tons in place, or 38.5 million potentially recoverable tons. The recovery factor of 90 percent almost certainly would be overestimated in this area due to the multiple splits.

3.5 Rail Loop

The rail loop location (Polygon 17) is problematic due to the lack of available options outside of the coal reserve. It is to be located in the west half of Section 9 in Tract 3. An estimated 23.9 million tons of coal in place (21.5 million tons potentially recoverable) are affected.

3.6 Hydrologic Protection – Mobile Equipment Pits

Polygons 18 and 19 encompass mobile equipment pits originally planned to maximize coal recovery in a low-overburden area adjacent to the middle pit initial box cut. In reviewing the initial mine plan, the Montana Department of Environmental Quality (MDEQ) requested "reconsideration of the inclusion of the Mobile Equipment cuts A-J into the mine plan" due to concerns regarding the "close proximity and connection of the clinker and Knobloch coal to Otter Creek and the associated alluvium". This is an area where recovery was considered uncertain due to expected groundwater inflow. In response to this request, these areas have been excluded from the mine plan as revised. Recovery may ultimately be possible depending on groundwater conditions encountered; in this event OCC will file a permit revision application. An estimated 10.8 million tons in place (9.8 million tons recoverable) are affected.

4.0 Coal Fenders

Coal fenders for ground control are not planned. A rib will be left along the low wall as the coal is loaded, but this coal will be recovered to the extent possible, consistent with quality and safety objectives, when retreating from the empty pit.

5.0 ARM 17.24.523 Coal Fires and Coal Conservation

(1) Coal fires in coal processing wastes, storage piles and bins, or unmined or waste coal in mine pits will be extinguished in accordance with a plan approved by the MDEQ and the Mine Safety and Health Administration. The plan will contain, at a minimum, provisions to ensure that only those persons authorized by the operator and who have an understanding of the procedures to be used are involved in the extinguishing operations.

(2) The mining operation will be conducted to prevent failure to conserve coal, utilizing the best technology currently available to maintain appropriate environmental protection as described in this coal conservation plan.

6.0 ARM 17.24.763 Coal Conservation

(1) Mining operations will be conducted to prevent failure to conserve coal, utilizing the best technology currently available to maintain environmental integrity as described in this coal conservation plan.