

OTTER CREEK MINE

17.24.325 COAL MINING OPERATIONS ON AREAS OR ADJACENT TO AREAS INCLUDING ALLUVIAL VALLEY FLOORS: SPECIAL APPLICATION REQUIREMENTS

17.24.325(1)

Otter Creek Coal, LLC (OCC) intends to conduct coal mining adjacent to the Otter Creek valley, a valley holding a stream in the semi-arid region of Eastern Montana. Baseline Report 325A – Alluvial Valley Floors, is a comprehensive report addressing the requirements of ARM 17.24.325.

17.24.325(2)

(a) The requirements of this subparagraph are addressed in Baseline Report 325A; please refer to Section 2 of that report. OCC acknowledges that portions of the floodplains of Otter Creek and of Tenmile, Threemile and Home Creeks meet the statutory definitions of adjacency and of an alluvial valley floor. Conversely, OCC requests that all other tributaries in the reach of Otter Creek below the Tenmile Creek road crossing – Fortune Coulee, East Fork Otter Creek, Chromo Creek, Gene Creek, Newell Creek - be determined non-adjacent, not alluvial valley floors, or both. Please refer to BR 325A Section 3.

(b) This subparagraph requires a determination by the Montana Department of Environmental Quality (MDEQ); no submittal of information or commitment by OCC is required.

(c) No response required.

17.24.325(3)

(3)(a)(i) and (ii) OCC requests that MDEQ make a determination that statutory exclusions apply to Tenmile Creek, Threemile Creek and Home Creek. The bases for this request are enumerated in detail in Baseline Report 325A, Section 3.

(3)(b) No response required.

(c)(i) Although a determination had not been made, it is clear based on Baseline Report 325A, Section 2 that the Otter Creek floodplain and portions of the Tenmile Creek, Threemile Creek and Home Creek floodplains exhibit alluvial valley floor characteristics, and that additional data collection and more thorough analysis was indicated.

(c)(ii) The information contained in this section and supporting Baseline Report 325A, and other related components of the PAP, is sufficient to enable MDEQ to make a determination with respect to the requirements of this subsection that operations at Otter Creek Mine will meet these requirements.

(3)(d) Information included in compliance with this subsection is enumerated below:

(i) Geologic structure on the base of the Knobloch coal: Exhibit 322A, Plate 2;

Surficial geology: Baseline Report 325A, Plate 2; and

Geologic Cross-Sections: Map 16; Baseline Report 325A, Plate 3.

(ii) Soil survey and data: Baseline Report 304L; also Baseline Report 325A, Section 2.4 and Plate 9;

Baseline vegetation survey and data: Baseline Report 304J; also Baseline Report 325A, Section 2.5 and Plate 10;

Land Use: Baseline Report 304M; also Baseline Report 325A, Section 2.6 and Plate 11; and

Crop Yields: Baseline Report 325A, Section 4.

(iii) Because there is no active flood irrigation utilizing diversion of stream baseflow, the requirements of this subparagraph have limited applicability. The following are relevant:

Surface hydrologic data, including streamflow, runoff, sediment yield and seasonal variations over at least one full year: Baseline Report 304E; Baseline Report 325A, Section 2.3.1; and

Field geomorphic surveys and other geomorphic studies: Baseline Report 325A, Section 2.2 and Plate 4.

(iv) Much of the Otter Creek floodplain has shallow groundwater, but investigations have shown that availability for use by hay species is limited due to high salinity, and “subirrigated” areas do not demonstrate enhanced production due to greater water availability. The required information is included as follows:

Geohydrologic data including observation well establishment for purposes of water level measurements, ground water contour maps, testing to determine aquifer characteristics, well and spring inventories, and water quality analyses describing seasonal variations over at least one full year: Baseline Report 304E; also Baseline Report 325A, Section 2.3.2;

Shallow groundwater investigations utilizing shallow piezometers: Baseline Report 325A, Section 5.1;

Groundwater contour maps: Baseline Report 304E; also Baseline Report 325A, Plate 7;

Physical and chemical analysis of overburden: Baseline Report 304H; and

Effect of the proposed mining operation on water quality and quantity: Exhibit 314A, Exhibit 314C.

(v) Plans showing how the operation will avoid, during mining and reclamation, interruption, discontinuance or preclusion of farming on the alluvial valley floors unless the premining land type has been undeveloped rangeland which is not significant to farming and will not materially damage the quantity or quality of water in surface and ground water systems that supply alluvial valley floors, are delineated in detail in Baseline Report 325A, Section 6.

(vi) Baseline Report 325A, Plate 11 shows ranches that could be affected by mining. The type and quantity of agricultural activity performed and its relationship to the ranch's total agricultural activity including an economic analysis is included in Baseline Report 325A, Section 4.

(vii) No response required.

(3)(e)(i)(A) Essential hydrologic functions are addressed in Baseline Report 325A, Section 5.0.

The essential hydrologic functions promoting agriculture on the Otter Creek flood plain are early season (late winter and spring) precipitation, inflow from tributary drainages, either unmanaged or directed by diversions and/or spreader dikes, and occasional flooding during major snow melt and/or spring rainfall events. These factors together, to varying degrees each year depending on timing and amount of precipitation and runoff, recharge fresh water in the root zone.

(e)(i)(B) Plate 6, Baseline Report 325A, is a topographic map of the Otter Creek drainage basin showing tributary drainages and drainage divides. Plate 4 of that report shows topography at a larger scale in the reach adjacent to the Otter Creek coal tracts and geomorphic data for Otter Creek and tributary streams in the area of the Otter Creek coal tracts. Geomorphology is discussed in Exhibit 325A, Section 2.2.

(e)(i)(C) Hydraulic characteristics of the alluvial aquifer(s) are included in Baseline Report 304E.

(e)(i)(D) Other factors that affect the interchange of water between surface streams and groundwater systems are addressed as follows:

Depth to groundwater and direction of groundwater flow are described in Baseline Report 304E; shallow groundwater is discussed in Baseline Report 325A, Section 2.3.2. See also Section 5 of that report; and

The extent to which the stream and associated aquifers provide recharge to, or are recharged by bedrock aquifers is described in the Groundwater Model included as Exhibit 314C, Appendix B.

(e)(ii)(A) Geomorphic characteristics of Otter Creek and its floodplain are addressed in Baseline Report 325A, Section 2.2. Vegetation is discussed in Baseline Report 304J; vegetation of the valley bottom is addressed in Baseline Report 325A, Section 2.5.

(e)(ii)(B) Hydraulic characteristics of the alluvial aquifer(s) are included in Baseline Report 304E. Permeability of the surface layer of fine-grained materials is addressed in Baseline Report 325A, Section 2.4. The NRCS series description for Haverson soils, which dominate the Otter Creek floodplain, describes these soils as the well drained with runoff negligible to medium depending on slope, with moderate permeability.

(e)(ii)(C) Physical and chemical properties of the surface layer of fine-grained material, including the subsoil, are addressed in Baseline Report 325A, Section 2.4; see also Section 5.1.. Chemical limitations in the subsoil and shallow groundwater limit utilization by plants and hence contribute little to sustained vegetation growth or cover during extended periods of low precipitation.

(e)(iii)(A) The geomorphology, geometry and physical character of the Otter creek valley are addressed in Baseline Report 325A, Section 2.2. The nature and stability of the streambanks and vegetation established in the channels and along the stream banks and floodplain are addressed.

(e)(iii)(B) Surface flows are discussed in Baseline Report 304E and Baseline Report 325A, Section 2.3.1.

(e)(iii)(C) Interchange of groundwater between bedrock aquifers and alluvial aquifers is addressed in Exhibit 304C. See also Baseline Report 325A, Sections 2.3.2 and 5 2.

(e)(iv) In addition to floodplains and terraces suitable for agricultural activities, a characteristic that makes water available is the presence of numerous surface runoff management facilities – diversions, spreader dikes, and retention dikes - to direct and detain inflow from ephemeral tributary drainages directly into agricultural (hay) fields and away from the Otter Creek channel. Please refer to Baseline Report 325C, Section 2.7.

(f) Statutory exclusions are addressed in Baseline Report 325A, Section 3.0.

17.24.801 ALLUVIAL VALLEY FLOORS: PRESERVATION OF ESSENTIAL HYDROLOGIC FUNCTIONS AND PROTECTION OF FARMING

(1) Operations at Otter Creek Mine will be conducted to preserve, throughout the mining and reclamation process, the essential hydrologic functions of alluvial valley floors not within the permit area. These functions will be preserved by maintaining those geologic, hydrologic and biologic characteristics that support those functions. Measures to protect essential hydrologic functions are discussed in Baseline Report 325A, Section 6.

(2) Operations at Otter Creek Mine will be conducted to reestablish, throughout the mining and reclamation process, the essential hydrologic functions of alluvial valley floors within an area of land affected. These functions will be reestablished by reconstructing those geologic, hydrologic and biologic characteristics that support those functions. Measures to protect essential hydrologic functions are discussed in Baseline Report 325A, Section 6.

(3) Operations at Otter Creek Mine will be conducted to ensure that the agricultural utility and the level of productivity of alluvial valley floors in affected areas are reestablished to premining levels. Reclamation procedures in affected areas of the Otter Creek valley floor to ensure re-establishment of agricultural utility and the level of productivity are discussed in Baseline Report 325A, Section 6.

17.24.802 ALLUVIAL VALLEY FLOOR: PROTECTION OF FARMING AND PREVENTION OF MATERIAL DAMAGE

(1)(a) Strip or underground coal mining operations will not interrupt, discontinue, or preclude farming on alluvial valley floors, unless:

- (i) the premining land type is undeveloped rangeland that is not significant to farming; or
- (ii) the area of affected alluvial valley floor is small and provides or may provide negligible support for production from one or more farms.

(b) If environmental monitoring shows that the Otter Creek Mine operation is interrupting, discontinuing, or precluding farming on alluvial valley floors, the operation will cease until remedial measures are taken by OCC. The remedial measures will be submitted to and approved by MDEQ prior to the resumption of mining.

(2) Coal mining and reclamation operations at Otter Creek Mine will not cause material damage to the quality or quantity of water in surface or underground water systems that supply alluvial

valley floors. If environmental monitoring shows that the coal mining operation is causing material damage to water that supplies alluvial valley floors, the mining operations will cease until remedial measures are taken by OCC. The remedial measures will be submitted to and approved by MDEQ prior to the resumption of mining operations.

(3) This subsection is not applicable.

17.24.804 ALLUVIAL VALLEY FLOORS: MONITORING

(1) An environmental monitoring system will be installed, maintained and operated by OCC on all alluvial valley floors during operations at Otter Creek Mine and will be continue until all bonds are released in accordance with ARM 17.24.1114. The monitoring system will provide sufficient information to allow MDEQ to determine that:

(a) the agricultural utility and production of the alluvial valley floor not within the affected area is being preserved;

(b) the potential agricultural utility and production on the alluvial valley floor within the affected area has been reestablished;

(c) the important characteristics supporting the essential hydrologic functions of the alluvial valley floor in the affected area have been reestablished after mining;

(d) the important characteristics supporting the essential hydrologic functions of an alluvial valley floor in areas not affected are preserved during and after mining;

(e) farming on lands protected under ARM 17.24.802 is not being interrupted, discontinued, or precluded; and

(f) the operation is not causing material damage to the quantity or quality of water in the surface or underground systems that supply alluvial valley floors protected under ARM 17.24.802.

(2) Monitoring will be performed at adequate frequencies, to indicate long-term trends that could affect agricultural use of the alluvial valley floors. The existing hydrologic monitoring network will be utilized to monitor surface water and groundwater quantity and quality in concert with hydrologic monitoring described in Exhibit 314B.

(3) Monitoring will be performed during operations to identify characteristics of the alluvial valley floor not identified in the permit application and to evaluate the importance of all characteristics requested by MDEQ.

(4) All monitoring data collected and analyses thereof will routinely be made available to MDEQ.

17.24.805 ALLUVIAL VALLEY FLOORS: SIGNIFICANCE DETERMINATION

(1) MDEQ determination; no response required. Information pertinent to any determination, however, may be found in Baseline Report 325A.

17.24.806 ALLUVIAL VALLEY FLOORS: MATERIAL DAMAGE DETERMINATION

MDEQ determination; no response required. Protection of alluvial valley floors during and after mining is addressed in Baseline Report 325A, Section 6. Please refer also to Exhibit 314C for a detailed examination of probable hydrologic consequences.