VOLUME II

LIST OF EXHIBITS - CONTINUED

6J/L Miscellaneous Cultural Resource Surveys (**Confidential Appendix**)

6M NW Mains Vent Shaft, 7E CE Borehole Pad, 6-East & WC Main Utility Borehole Pads (TR21-97, MR24-325) Cultural Resources (**Confidential Appendix**)

6N 18-Right Ventilation Shaft Cultural Resources (**Confidential Appendix**)

6O 6-North Mains Intake Shaft Cultural Resources (**Confidential Appendix**)

6P NMD/WMD (PR06-07, PR09-08) Cultural Resources Information (**Confidential Appendix**)

6Q 6MN Mine Water Storage Reservoir (TR07-61) Cultural Resource Information (**Confidential Appendix**)

6R 19RT Mine Dewatering Installation (TR10-73) Cultural Resources Information (**Confidential Appendix**)

6S WMD, 18L Ventilation Shaft Installation, and 16RT WMD Stabilization Boreholes (TR09-66 and MR11-253) Cultural Resources Information (**Confidential Appendix**)

6T Overland Conveyor, 15LT Ventilation Shaft, 16LT Utility Borehole, 5MN Borehole and Pipelines, and 13LT Outby Utility Borehole (MR's 11-254, 14-283, 15-288, and 15-291, and TR's 11-77 and 11-78) Cultural Resources Info. (**Confidential Appendix**)

7 Subsidence Predictions

7A Stability Investigation of the Twentymile Sandstone Cliff

7B Fish Creek AVF/Stream Study: Subsidence Projections

7C Fish Creek AVF/Stream Study: Monitoring Plan

7D Analysis of Angle-of-Draw, Cyprus Twentymile Coal Company, Foidel Creek Mine, Routt County, Colorado, Collin S. Stewart, August 1992

7D-1 Owner Agreements (Subsidence)

VOLUME II-E

LIST OF EXHIBITS - CONTINUED

11, 13, 14, 15, 16, 17, 21, and 22, T5N, R86W. Survey results are presented in the Confidential Appendix, in Exhibit 6L.

WCR Development and Mining (PR14-10, PR15-11, MR15-289, MR23-324) – Most of the Wolf Creek Reserve mining area underlies areas previously undermined by TC's historic and ongoing mining operations in the Wadge Coal Seam in the Eastern and Northern Mining Districts. Baseline studies related to potential surface effects for these previously mined areas were completed and are included in the PAP. The proposed WCR development and mining activities will result in mining and potential surface subsidence effects which extend beyond the eastern limits of the previously surveyed and mined areas. TC has contracted with Metcalf Archaeological Consultants, Inc. to complete intensive Class III cultural resources surveys for any areas subject to potential surface subsidence effects, which have not already been surveyed. Generally, these surveys covered limited additional areas in Sections 10, 12, 13, and 14, T5N, R86W. The surveys resulted in identification of two new sites and one previously recorded site which could potentially be affected by mining-related subsidence. Metcalf Archaeological Consultants, Inc. reviewed the subsidence evaluations and profiles for the areas associated with the identified sites, and provided a letter concluding that based on the very limited projected changes in ground elevation and gradient, the potential to impact any buried cultural materials would be negligible. Review by both the CDRMS and SHPO resulted in concurrence with this conclusion. Survey results are presented in the Confidential Appendix, in Exhibit 6L.

13LT Outby Utility Borehole (MR15-291, MR292) - TC contracted with Metcalf Archaeological Consultants, Inc. to complete intensive Class III cultural resources surveys of the proposed 13LT Outby Utility Borehole. The surveys covered lands located in Section 20, T5N, R86W. Due to adverse ground conditions, the cultural resource survey for the 13LT Outby Utility Borehole was conducted as an auger survey under study plans reviewed and approved by the SHPO. The approved study plan involved augering to a depth of approximately 1.0m on a 15m grid for the pad area, and on two parallel lines spaced 15m apart along the access corridor. This effectively resulted in a 30m wide inventory area for the access, and a 135m x 135m inventory area for the pad disturbance. The field archaeology crew looked for staining and artifacts during the augering, screened the excavated material, and prepare detailed field notes on stratigraphy, soil character, and any artifacts found. The 13LT Outby Borehole Study Plan is presented in the Confidential Appendix, in Exhibit 6T. The field work did not identify any cultural resources and resulted in a finding of no adverse effect, based on the preliminary survey report. Both the preliminary and final survey reports are provided for reference in Exhibit 6T.

9-East Utility Borehole Installation (MR16-296) – In conjunction with permitting for the Wolf Creek Reserve development and mining (PR15-11) Metcalf Archaeological Consultants, Inc. completed intensive Class III cultural resources surveys for any areas subject to potential surface subsidence effects, which have not already been surveyed, as well as any related areas of additional surface disturbance, including utility boreholes. Generally, these surveys covered limited additional areas in Sections 10, 11, 12, 13, and 14, T5N, R86W. The proposed utility borehole pad areas (Options 1-2) and roads would not impact any identified cultural resource sites. Survey results are presented in the Confidential Appendix, in Exhibit 6L

6-East & WC Mains Utility Borehole Installations (MR24-325) – TC Contracted Metcalf Archaeological Consultants, Inc. to conduct class III cultural resources surveys on the proposed pad areas for the 6-East and WC Mains Utility Boreholes. The 6-East survey covered areas within Sections 14 and 15 T5N, R86W and was conducted over two separate surveys. The WC Mains Survey covered areas within Section 17 T5N, R86W. Two previously recorded sites, one being the railroad track and the other being a historic irrigation ditch were located within the survey area for the 6-East location. Both were recommended Not Eligible for inclusion on the NRHP. No isolated finds or buried cultural material were found within the surveyed areas. Survey results are presented in the Confidential Appendix, in Exhibit 6M.

RULE 2.04.5 - GENERAL DESCRIPTION OF HYDROLOGY AND GEOLOGY

Each application shall contain a description and map, prepared in accordance with 2.10, of the geology, surface and ground water systems, including water quality and quantity, of all lands within the proposed permit area, the adjacent area, and the general area. The description shall include information on the characteristics of all surface and ground waters within the general area, and any water which will flow into or receive discharges of water from the general area. The description shall be prepared according to 2.04.5 and 2.04.7, and conform to the following:

(a) Information on surface and groundwater systems including water quality, water quantity, and geology related to the hydrology of areas outside the permit area and within the general area shall be provided by the Division, to the extent that this data is available from an appropriate Federal or State agency.

(b) If this information is not available from those agencies, the applicant may gather and submit this information to the Division as part of the permit application.

(c) The permit shall not be approved by the Division until this information is made available in the application.

RESPONSE

This application contains comprehensive and detailed descriptions and maps concerning the geology and hydrology of the proposed permit area, adjacent area, and the general area. The definitions of these areas, as contained in Rule 1.04, have been applied in what TC believes to be a reasonable manner to the lands surrounding the planned mining operation. The permit area contains all lands on which the operator will conduct mining operations during the term of the permit. The adjacent area covers lands and resources outside the permit area which may be adversely affected by mining operations. The general area includes the topographic and ground water basin surrounding the area to be mined, including one or more watersheds containing perennial streams and ground water systems. The general area is of sufficient size to allow assessments of cumulative hydrologic impacts in the basin.

A strict application of these definitions to Twentymile Park results in the areas shown on Map 4, Proposed Hydrologic Area Boundaries. The proposed permit area includes all lands to be disturbed by mining activities over

- Barricade Chamber Access Escape Shaft
- 10-Right Dewatering Boreholes 1 and 2
- Substation No. 11 (NMD) Power-Drop Borehole
- NW Mains Ventilation Shaft and Borehole
- 6-Main North Ventilation/Escape Shaft and associated utility boreholes (7)
- EMD Ventilation/Escape Shafts (2, sealed in late 2009)
- 18-Right Ventilation/Escape Shaft (sealed in late 2009)
- 18-Left Ventilation Intake and Return Shafts and associated utility boreholes
- 19-Right Mine Dewatering Borehole
- 16-Left Utility Borehole
- 17-Left Cement (WMD Stabilization) Borehole (sealed in 2013)
- 15-Left Ventilation Shaft (permitted, pad constructed. Shaft and Rock dust tank installation withdrawn)
- 5-Main North Borehole
- 10-East Emergency Borehole (permitted but not completed)
- SWMD Thickener Underflow Borehole
- Sandstone Sub Thickener Underflow Borehole
- SWMD and WMD Thickener Underflow boreholes (2)
- 7-East Cross Entries Cement Borehole
- 18LT Dewatering Borehole
- 6-East Utility Bleeder Borehole
- WC Mains Utility Borehole

site will be approximately 450’ x 450’ and approximately 12” of topsoil will be salvaged, seeded and stockpiled adjacent to the pad location to be used for reclamation. Refer to Exhibit 49FF.

Borehole completion will involve drilling, installing, and grouting steel surface casing in place to a maximum depth of approximately 60 feet (dependent on the ground conditions encountered) The borehole will be drilled to a depth of 1400 feet into the 7 East entries. The borehole will be 12 inches in diameter and house an 8 5/8 diameter casing. Water, drilling fluids, and cuttings will be contained within one or more excavated pits located on the pad site.

Due to the large volume of cement needed to fill the entries and to be able to pump the grout continuously a cement/ grout batch plant will be set up on the pad site. The cement grout will be pumped directly into the borehole on the pad site into the 7 East cross entries. Three large construction tents will be set up on the pad to protect from winter conditions during the duration of the pumping project. The first tent (30’ x 50’quonset) will house the water to prevent freezing, the second tent (30’ x 50’ quonset) will house the flyash to protect it from wind and snow, the final tent (84’ x 100’ Quonset) will house the cement plant and protect the equipment from the winter conditions. All of the tents will be temporary structures with no foundations. The tents are owned by the grout contractor and will be removed once the grouting is complete

The pad location is relatively flat and therefore minimal diversion water is expected. Diversion ditches will be placed on the upslope sides of the pad to control any runoff water. The ditches will then be filtered with rock check dams at the ends and vegetation throughout the ditch.

WC Mains Utility Borehole (MR24-325)

TC anticipates the WC Mains Utility pad and borehole to be constructed in the summer 2024. This utility site will be used to connect the surface to the Main Entries in the Wolf Creek Seam near the 10 East headgate via a 12” borehole cased to 8 5/8”. This borehole who will be used to transfer cement material into the underground workings to be used to construct roof support columns. The location of this utility site is centrally located to be used to support multiple longwall panels within the Wolf Creek Seam. The pad site will be accessed from a two-track light duty road that runs along the top of the ridge to the North of the 6MN Pad. The main access to the site will be using the Camilletti Road. Minor road improvements will be made to allow decent access via semi trucks for material deliveries. The graveled pad site will be approximately 200’ x 200’ and 12” of topsoil will be salvaged, seeded, and stockpiled adjacent to the pad location to be used for reclamation. Diversion ditches will be used to divert runoff water from entering the pad site. Ditches will be filtered with rock check dams to help control sediment. Refer to Exhibit 49EE.

Borehole completion will involve drilling, and installing and grouting steel casing. A surface casing will be placed to a maximum depth of 60 feet and then the remaining borehole will be drilled to a diameter of 12 inches and grouted and cased with 8 5/8” casing approximately 1,615 feet into the mine workings. Water, drilling fluids, and drilling cuttings will be contained within one or more excavated pits located on the pad site.

The site will be used for multiple long wall panels as the mine progresses north. During active use periods it is expected that there will be numerous trucks and equipment on the pad site. It is projected that the site will contain storage tanks for water and cement material, a mixing unit, pumping unit and if weather and temperatures do not allow for efficient mixing and pumping a temporary tent may be set up to keep the material and equipment warm and out of the weather. It is expected that these active periods will only last 2-4 months at a time and then all the equipment will be removed from the site until the next active period. It is anticipated that the pad will be used once every 1-2 years.

During active use times a 2” water line will be laid on the surface from the 6MN million-gallon tank to fill the water holding tank at the pad. The line will be inspected daily for leaks.

6-East Utility Bleeder Borehole (MR24-325)

The 6 East Utility Borehole location is permitted to help aid in underground ventilation if needed. The site will only be constructed if it is needed. If it is determined to be necessary, a 200' x 200' graveled pad will be constructed and a borehole will be drilled into the underground workings. 12" of Topsoil will be salvaged, stockpiled and seeded adjacent to the pad for use during reclamation. Diversion ditches will be used to divert runoff water from entering the pad site. Ditches will be filtered with rock check dams to help control sediment. Access to the site will be obtained by the use and minor improvement of a two-track light duty road off CR 33 on the east side of the mine boundary. Approximately 1,000 feet of new road will need to be constructed to reach the pad location. Refer to Exhibit 49EE.

A max surface casing with a max diameter of 18" will be drilled and installed down to no more than 60 feet below the surface. The borehole will be a maximum of 12" in diameter and cased with a maximum of 8 5/8" casing into the mine workings to a depth of approximately 1,200 feet below the surface.

Once the pad is constructed a propane fired ventilation exhaust unit will be set up on the pad site along with a propane storage tank.

5. Light-Use Roads to Powerline Substation and Subsidence Monitoring Site

A light-use road and a permanent road will be used to access the substation. The light-use road will run 4,800 feet to the substation and will follow the existing "fence" road. The light-use road will be designed per the requirements of Rule 4.03.3, Light-Use Roads. The light-use road will be sufficiently maintained in order to assure erosion control. Surfacing of the road will be adequate for the general use of the road, and will be compatible with winter and spring, snow removal requirements. Access to the light-use road and substation will also require the utilization of a permanent road approved by the CMLRD on February 3, 1988 (Technical Revision TR87-12; Permit C-81-071). This permanent road runs 12,000 feet from Country Road #27 and is maintained under CYCC's Permit C-81-071. The roads will be maintained by TCC. Upon substation removal, the light-use road will remain as part of the approved postmining use of ranch management. The light-use and permanent road are shown on Map 39, Substation and Powerline Location. A light-use road will be used to access a subsidence borehole meter at Mine 2 (MR89-37). The road will be reclaimed on completion of the subsidence borehole metering.

6. Light-Use Roads to 6MN Mine Water Storage Reservoir and Passive Treatment System

A light-use road will access the 6MN Mine Water Storage Reservoir, for inspection and maintenance purposes. The light-use road will run approximately 130 feet from the existing 6MN Ventilation Shaft Installation access road. A second road will extend from the Shaft Pad approximately 2,500 feet, paralleling the northern diversion ditch for the Passive Treatment System. The light-use roads are designed per the requirements of Rule 4.03.3, Light-Use Roads, will be approximately 20 to 25 feet wide, with overall grades of 0.7 percent and 1.4 percent, respectively, and are designed with a 6-inch compacted road-base base course, and 3-inch gravel surfacing. The location of the roads, and road configuration and cross-section, are shown on the design drawings included in Exhibits 49O and 49EE, respectively. These light-use roads will be maintained on a periodic basis to assure suitability for use and effective erosion control. Surfacing will be adequate for the general use of the road, and will be compatible with winter and spring snow removal requirements. At such time as the 6MN Reservoir and/or Passive Treatment System are no longer needed, the associated light-use roads will be removed and the disturbance area(s) reclaimed.

7. Light-Use Road to 18-Left Ventilation Shaft Installation

A light-use road will access the 18-Left Ventilation Shaft Installation, for inspection and maintenance purposes. The light-use road will run approximately 420 feet from Routt County Road 27. The light-use road is designed per the requirements of Rule 4.03.3, Light-Use Roads, will be approximately 24 feet wide, with an overall grade of 0.0 percent, and is designed with a 18-inch compacted pit run base course, and 6-inch road base and/or gravel surfacing. The location of the road, and road configuration and cross-section, are shown on the design drawings included in Exhibit 49R. The light-use road will be maintained on a periodic basis to assure its suitability for use and effective erosion control. Surfacing of the road will be adequate for the general use of the road, and will be compatible with winter and spring, snow removal requirements. At such time as the 18-Left Ventilation Shaft Installation is no longer needed, the light-use road will be removed and the associated disturbance area reclaimed.

8. Other Light-Use Roads

In addition to the above light-use roads, a number of other roads of this classification are located around the property. The other roads include the following: Low Quality Coal Stockpile Road, West Gate Road, Fish Creek Borehole Road, Escape Shaft/Borehole Site Road, EMD Dewatering Borehole Road, Lieske Substation Road, MET Station Road, 6-Right Thickener Underflow Borehole Road, 5-Right Borehole Road, 13-Left Outby Borehole Road, 9-East Utility Borehole Road, 6-East Utility Borehole, WC Mains Utility borehole, the access roads to the SWMD Thickener Underflow Boreholes, and the roads used to access the 12, and 14 through 17 Thickener Underflow Boreholes. All of these roads are shown on Map 24A and have been designed and constructed in conformance with Rule 4.03.3.

General

No bridges are planned with this permit revision application. All culverts with an end area of less than 35 square feet will be designed to pass, at a minimum, the 10-year, 24-hour event. Should a culvert with an end area greater than 35 square feet be needed, it will be designed to safety pass the 20-year, 24-hour event. The culverts have also

criteria for a Small Area Exemption, the proposed drainage control measures should be effective in controlling runoff and sedimentation, and construction of full-scale drainage and sediment control structures is neither needed nor justified.

10-East Emergency Air Borehole (MR15-289) – The existing access road, temporary site access, and proposed pad are located on adjacent minor ridgelines, and will have minimal impact relative to runoff and sediment contributions. Upgradient drainage will be limited, and the road will not cross any natural drainages so no culverts will be required. Site drainage will be effectively controlled under a Small Area Exemption by diverting any limited upgradient drainage around the pad area with a small upgradient interceptor ditch and temporary revegetation of the pad surface and associated cut/fill areas. The interceptor ditch will drain through a rock-lined sediment trap to the adjacent drainage to the west. As a very limited disturbance area (approximately 1.5 acres for the pad disturbance) the disturbance area meets the applicable criteria for a Small Area Exemption, the proposed drainage control measures should be effective in controlling runoff and sedimentation, and construction of full-scale drainage and sediment control structures is neither needed nor justified.

13-Left Outby Utility Borehole (MR15-291) – Given the limited disturbance areas, the location of the road and pad on a low-gradient sidehill, and the very temporary nature of the planned disturbance, the 13LT Outby Utility Borehole pad, and associated road will have minimal impact relative to runoff and sediment contributions. The limited amount of drainage from upgradient areas will be intercepted and routed around the borehole pad by a small upgradient diversion ditch on the southwest and northwest sides of the pad. The existing ranch road crosses a small ephemeral drainage, and the existing culvert will remain in-place. The culvert installation will be evaluated relative to condition and cover to carry the anticipated truck traffic, the culvert will be replaced or extended as necessary, and adequate cover will be placed to carry the anticipated loads, without crushing the culvert. Drainage from the borehole pad area will be controlled under a Small-Area Exemption, with gravel surfacing on the pad and road to control runoff and sediment and placement of rigid sediment filter material on the northeast side of the pad area. The upgradient diversion ditches will drain through rock sediment basins to the undisturbed adjacent lands, and pad cut/fill areas will be stabilized with temporary revegetation seeding. As a very limited disturbance area (approximately 1.0 acres for the pad and road, of which 2.4 acres is road) the disturbance areas meet the applicable criteria for a Small Area Exemption, the proposed drainage control measures should be effective in controlling runoff and sedimentation, and construction of full-scale drainage and sediment control structures is neither needed nor justified.

9-East Utility Borehole Installation (MR16-296) – The 9-East Utility Borehole Installation will involve limited surface disturbance for the required pad and light-use road and will remain in-place for a limited time (estimated life of 3-years). With limited run-on from the small upgradient drainage area, which will be conveyed under the road through a series of culverts or diverted around the pad by a perimeter ditch with rock-lined sediment traps, and a limited disturbance area, site drainage control will be addressed through a Small Area Exemption. Runoff and sediment from the pad and road will be effectively controlled through the use of gravel surfacing, revegetation of cut/fill areas, and downgradient sediment control for the soil stockpiles. With a limited disturbance area (approximately 2.1 acres for the pad and 1.6 acres for the road) the disturbance areas meet the applicable criteria for a Small Area Exemption, the proposed drainage control measures should be effective in controlling runoff and sedimentation, and construction of full-scale drainage and sediment control structures is neither needed nor justified.

7 East Cross Entries Borehole (TR21-97) The 7East Borehole pad and access road will involve the construction of the pad site and short access road which will only be used for a limited time while the cement grout is being pumped underground. With limited run-off from the small upgradient drainage area, which will be conveyed around the pad by a perimeter ditch with rock-lined sediment traps, and a limited disturbance area, site drainage control will be addressed through a Small Area Exemption. Runoff and sediment from the pad and road will be effectively controlled through the use of gravel surfacing, revegetation of cut/fill areas, and downgradient sediment control for the soil stockpiles. With a limited disturbance area (approximately 4.65 acres for the pad) the disturbance areas meet the applicable criteria for a Small Area Exemption, the proposed drainage control measures should be effective in controlling runoff and sedimentation, and construction of full-scale drainage and sediment control structures is neither needed nor justified.

WC Mains Utility Borehole (MR24-325) The WC Mains borehole pad will involve limited surface disturbance required for the pad. With limited run-on from the small upgradient drainage area, the site drainage controlled will be addressed through a Small area exemption. Runoff and sediment from the pad and road will be effectively controlled by gravel surfacing, revegetation of cut/fill areas, and downgradient sediment control for the soil stockpiles. The upgradient

diversion ditches will drain through rock sediment basins to the undisturbed adjacent lands, and pad cut/fill areas will be stabilized with temporary revegetation seeding. The total disturbance area will be less than 1.5 acres and meets the applicable criteria for a Small area Exemption, the proposed drainage control measures should be effective in controlling runoff and sediment.

6 East Utility Borehole (MR24-325) If the 6East Utility Borehole is needed and constructed the pad and access road will involve limited surface disturbance required for the pad and access road. With limited run-on from the small upgradient drainage area, the site drainage controlled will be addressed through a Small area exemption. Runoff and sediment from the pad and road will be effectively controlled by gravel surfacing, revegetation of cut/fill areas, and downgradient sediment control for the soil stockpiles. The upgradient diversion ditches will drain through rock sediment basins to the undisturbed adjacent lands, and pad cut/fill areas will be stabilized with temporary revegetation seeding. The total disturbance area will be less than 3 acres for the road and pad site and meets the applicable criteria for a Small area Exemption, the proposed drainage control measures should be effective in controlling runoff and sediment.

Field Geotechnical Investigations – TC occasionally conducts field geotechnical investigations prior to, and as the basis for, design and construction of engineered structures. Geotechnical investigations typically involve shallow soil borings (up to 30 feet) using a hollow-stem auger, and/or excavation of shallow (up to 15 feet) test pits. For both soils borings and test pits, surface disturbance is minimal (no more than 10 x 10 feet for boreholes, and 10 x 15 feet for test pits) and both disturbance and subsequent stabilization occur within a timeframe of less than one day for each site (typically test pit excavation/soils boring, and backfilling and leveling of the resultant small area/auger-hole, occurs in a continuous sequence within the course of less than two hours for each location). The geotechnical investigation activities do not involve the use of water and are conducted under dry conditions, so the potential for related hydrologic impacts is negligible. All geotechnical disturbance is reseeded by broadcast seeding within 6-months of disturbance, although natural revegetation typically occurs much sooner due to the limited timeframe and extent of the associated disturbance. Occasionally perforated PVC pipe may be inserted in a completed borehole, and the remainder of the hole backfilled with clean gravel, as a temporary piezometer installation to measure any fluctuation in water-levels. This type of piezometer installation is normally very temporary (typically used less

salvaged and placed in stockpile for future use in reclaiming the site. A temporary soil stockpile(s) will be established on the northwest side of the pad area. The natural vegetative materials incorporated into the soil, and seeding with the topsoil stockpile stabilization seed mixture, will stabilize and protect the stockpiled soil materials. Soil salvage volumes are indicated on Table 49A.

9-East Utility Borehole Installation (MR16-296) - Light-use road and pad construction for the 9-East Utility Borehole Installation will involve removal of any large vegetation and stripping and stockpiling of other vegetation, soil, and organic materials. The road and pad are located on a low-gradient sidehill, with a pad area of approximately 2.1 acres, and a road corridor of approximately 1.6 acre. TC will recover and salvage up to 2 feet of soil from the road and pad areas, resulting in recovery and stockpiling of a maximum volume of approximately 11,880 cubic yards of soil material for future use in reclaiming the site. Note that, based on available soil mapping information and descriptions, soil depths in the project area vary, but may be up to 38-inches in thickness. TC proposes to recover up to 24-inches of soil, both in order to minimize site disturbance and because replacement of 24-inches of soil material is more than adequate to support effective revegetation efforts in this area. Temporary soil stockpiles will be established at reasonable intervals along the road and adjacent to the pad area. The natural vegetative materials incorporated into the soil, and seeding with the topsoil stockpile stabilization seed mixture, will stabilize and protect the stockpiled soil materials. Soil salvage volumes are indicated on Table 49A.

7 East Cross Entries Borehole (TR21-97) - Access road and pad constructions for the 7 East Cross entries borehole will involve removing the vegetation and stripping and stockpiling the topsoil. The access road and the pad are located on minimal sloping ground therefore very little earthwork will be required. The pad site will be approximately 450' X 450' for an area of ~4.65 acres. The access road will be a total of 6,300 feet and 30 feet wide for a total area of disturbance equal to 4.34 acres. 3,500 feet of the access road is an existing ranch road that will be improved for truck traffic. TC will recover and salvage 12 inches of topsoil for an approximately volume of 7,500 cubic yards. Soil salvage volumes are indicated on Table 49A.

WC Mains Utility Borehole (MR24-325) – Access Road and pad construction for the WC Mains Utility Borehole will involve removing the vegetation and stripping and stockpiling the topsoil. The access road and pad are located along the top of a ridge line, some earthwork will be required for the pad site. The pad will be approximately 200' x 200' plus the topsoil and pad sloping will create a disturbance of roughly 2 acres. The access road is an existing two-track that will require minor improvements. TC will recover and salvage 12" of topsoil amounting to a volume of approximately 1,670 cubic yards of topsoil from the disturbance area. Soil salvage volumes are indicated on Table 49A.

6 East Utility Borehole (MR24-325) – Access Road and pad construction for the 6 East Utility Borehole will involve removing the vegetation and stripping and stockpiling the topsoil. The new sections of access road and pad are located on minimal sloping ground and will require little earthwork. The pad site and new access road will result in a new disturbance area of approximately 1.7 acres and will require the recovery and stockpile of approximately 2,700 cubic yards of topsoil. Soil salvage volumes are indicated on Table 49A.

support beams and decking will be suspended from the steel casing by steel straps (i.e. I-beams or similar support structures) welded to the support beams. The steel straps will be welded to the existing 48-inch diameter casing. Once this is completed, a 24-inch thick reinforced concrete slab will be poured in-place over the previously placed decking. The void from the top of the concrete slab to within 5 feet of the surface will be backfilled with inert fill material (approximately 1.4 CY) from the surrounding area. The next 2 feet of the shaft will then be filled with concrete to form a surface plug for the shaft. Suitable fill material will be placed in the remaining 3 feet of the shaft (approximately 1.4 CY), and then the site will be re-soiled and revegetated. The redistributed soil will be seeded with the pastureland seed mixture.

NMD Power Borehole - Upon completion of mining, and when the power borehole is no longer needed, the facilities will be removed and the site reclaimed. Removal of the surface facilities will involve dismantling of surface structures, which includes the powerline, transformer and pad, road and culvert, and building. After the facilities are removed, the site will be regraded to blend with the existing terrain, the stockpiled soil will be redistributed over the area, and the power borehole pad and reclaimed road segments will be seeded with the pastureland seed mixture. The entire road will be chisel-plowed after removing the geotextile.

WC Mains Utility Borehole (MR24-325) – The WC Mains Utility borehole is centrally located to support multiple longwall panels in the Wolf Creek Seam. The site will remain in place until it can no longer be used to support the mine, at which time the borehole will be abandoned, and the pad site will be reclaimed. The borehole will be plugged and sealed in accordance with the state and MSHA regulations with the use of cement to with in 3-5 feet of the surface. The casing will be cut off at least 3 feet below the projected final surface elevation. The pad will be stripped of gravel and regraded and the topsoil redistributed to the approximant original contours. The site will be seeded with the appropriate seed mix.

6East Utility Borehole (MR24-325) – The 6 East Utility borehole will be used to aid in ventilation if needed. The site will only be constructed if additional ventilation is needed. The borehole would be connected into the back of the 6East Panel and could be used for multiple panels if needed. The site will be decommissioned when no longer needed to support the mining operation. All surface equipment would be removed along with the pad gravel. The borehole will be plugged and sealed in accordance with the state and MSHA regulations with the use of cement to with in 3-5 feet of the surface. The casing will be cut off at least 3 feet below the projected final surface elevation. The pad will be regraded and the topsoil redistributed to the approximant original contours. The site will be seeded with the appropriate seed mix.

Drillhole or Well Plugging and Sealing, and Well and Pipeline Reclamation and Abandonment - All drillholes will be plugged, sealed, and abandoned unless they are converted for long-term use as a monitoring or water-supply well. Deeper drillholes will be plugged with a minimum of 6 cubic yards (about 750 feet) of cement slurry – this is the off-road transport capacity of a cement truck. Shallower drillholes will be plugged with between 3 and 5 cubic yards of cement slurry (as appropriate). The cement slurry will be tremied into the drillhole from the bottom of the hole, up through the target units. This will effectively plug and seal all coal beds and potential groundwater aquifers to prevent vertical groundwater migration and cross-contamination of aquifers.

Any remaining open drillhole interval will be filled with other suitable plugging material (plug gel or vendor-specific grout compounds) and/or drill cuttings to within 5 feet of the ground surface and the drillhole will be sealed with a surface plug consisting of at least 5 feet of cement or other suitable permanent plugging material. Surface casing will be cut-off at or below grade. Reclaimed drillhole locations will be marked with either a steel fence post or a metal survey cap at, or below, ground level (used where agricultural cropping occurs). All drillhole locations will be accurately surveyed, and distinctly numbered, allowing for future identification. Abandonment reports will be prepared and filed, as required by applicable regulations. Similarly, monitoring wells, when no longer needed, will be plugged, sealed, and abandoned in essentially the same manner, with the stipulation that cement slurry will be used for plugging the well.

All pipelines will be plugged and abandoned in-place. Pipelines will be drained, cut-off at least 3 feet below the natural or reclaimed surface, plugged or capped, and the plugged ends will be buried. Any access manholes or

monitoring pipes or equipment will be removed, and any associated excavations will be backfilled and regraded, followed by soil material replacement and revegatation.

Exploration Disturbance

Following completion of exploration activities (drilling, sampling, and geophysical logging) for each exploration site, any drillholes not converted to monitoring wells will be plugged, sealed and abandoned, as previously described, and exploration disturbance will be reclaimed. Site reclamation will follow completion of exploration activities for each site as soon as reasonably practical, recognizing however, that certain reclamation activities may be coordinated to take advantage of equipment and personnel availability. The following summarizes the steps and general sequence for reclamation of exploration disturbance areas:

1) On completion of exploration activities at a given site, all trash, debris, and exploration equipment and supplies will be removed from the site
2) For drill-sites, excess drilling fluids may be pumped from mud pits for off-site disposal, and the mud pits allowed to dry-out. Mud pits or excavated trenches will be backfilled with the excavated material and compacted to minimize any settling. Any excess drill cuttings will be spread over the drill-pad, anddrill-pads, trenched areas, and any new access road segments graded to approximate their original configuration and blend with the adjacent terrain.
3) Stockpiled or windrowed topsoil will be redistributed at a uniform thickness over disturbed areas.
4) Disturbed areas will be reseeded to stabilize the surface and control erosion using the following seed mix, or a mixture developed in consultation with the appropriate landowner or as specified by the CDOW (for areas with state surface ownership). Replaced topsoil will be scarified prior to seeding, and areas will be drill or broadcast seeded at the prescribed rates. A harrow or similar implement will be used to drag the surface and cover the seed following seeding.

Seeding of reclaimed exploration sites will occur during the first favorable seeding period (typically late fall [preferred], or early spring) following completion of site reclamation.

TABLE 49A
Soil Stockpile Summary

STOCKPILE ID	CURRENT VOLUME (CY)	VOLUME TO BE ADDED (CY)	TOTAL VOLUME (CY)
FCB-1	7,400	0	7,400
FCB-2	350	0	350
FCB-3	150	0	150
FCVF-1	350	0	350
SSS-1	2,000	0	2,000
RDT-1	800	0	800
WWTF-1	4,000	0	4,000
SF-1	54,850	0	54,850
SF-2	55,850	0	55,850
SF-3	109,400	300	109,700
SF-4	3,650	0	3,650
SF-5	700	1,450	2,150
SF-6	152,750	450	153,200
SF-7	38,700	0	38,700
SF-8	4,100	0	4,100
SF-9	5,800	0	5,800
SF-10	350	0	350
SF-11	100	0	100
SPSP-1	6,300	100	6,400
SPSP-2	4,150	0	4,150
SF-12,13,14 (1)	20,000	0	20,000
SF-15	0	800	800
SF-16	0	2,200	2,200
SF-17	0	900	900
CRDA-S1 and S2	131,800	185,400(2)	317,200(2)
TOTAL	603,550	191,600	795,150

EASTERN AND NORTHERN MINING DISTRICTS

10RT Dewatering Borehole	7,200	250	7,450
10RT Dewatering Treatment Pond (includes access road)	0	6,300	6,300
EMD Ventilation Site	4,750	0	4,750
7 North Escape Shaft	2,200	0	2,200
MC Shop to FC Tipple	12,800	0	12,800
NMD Power Borehole & Road	0	5,700	5,700
Ventilation Shaft & Road	0	2,550	2,550
18RT Shaft & Road(3)	0	6,600	6,600
6MN Shaft, Road, & Reservoir(4)	0	23,700	23,700
19RT Borehole/Pipeline	0	6,050	6,050
5MN Cement Borehole	0	6,550	6,550
TOTAL	26,950	57,700	84,650

WESTERN MINING DISTRICT

18Lft Shaft & Road	0	13,550	13,550
WMD Stab. Borehole	0	2,600	2,600
17LT Rockdust Install.	0	4,000	4,000
15LT Vent Shaft	0	5,600	5,600
16LT Utility Borehole	0	10,900	10,900
13LT Utility Borehole	0	8,230	8,230
TOTAL	0	44,880	44,880

WOLF CREEK RESERVE

9E and 10E Boreholes	0	13,780	13,780
7 East Cross Entries	0	7,500	7,500
WC Mains Borehole	0	2,970	2,970
6E Utility Borehole	0	1,770	1,770
TOTAL	0	21,280	21,280

(1) Soil from Stockpiles SF-12 and 13 has been relocated to Stockpiles CRDA – S1 and S2
(2) For CRDA S1 and S2, the volume to be added will be direct handled or placed in a future stockpile(s)
(3) The volume listed for the 18RT Shaft/Roads is split among four stockpiles, roughly 40/30/15/15 percent beginning at the shaft pad and running back along the access road to the stock-pond location. Locations are shown on Map 29.
(4) The volume listed for the 6MN Shaft, Roads, and Reservoir is split among four stockpiles, roughly 40/30/15/15 percent, beginning at the shaft pad stockpile and running back along the access road to the NW Mains Vent Shaft. Locations are shown on Map 29.