The coal refuse disposal site meets general site requirements of Section 4.10. It is located on some of the most moderately sloping and naturally stable areas available. Additional problems are circumvented in that slopes are less than specified for valley or head-of-hollow fill. The hydrologic study of the disposal site indicated that springs and perennial water courses are absent in the area; and the geotechnical investigation for the disposal site indicated that there is no ground water present. Holes were drilled to 44 feet deep in the lowest part of the Refuse Disposal Area and no water was found. See Illustration 21. Thus, underdrain systems to prevent infiltration of water into the refuse bank were not required.

The Refuse Disposal Area is sub-divided into 12 sub-areas. Experience with the refuse has shown that more than one sub-area must be used at a time to allow drying of the refuse prior to compacting in lifts. Drying becomes a particularly difficult problem during the winter months. It is anticipated that about 120 acres may be in use at any one time. The first sub-area to be opened was RP-1. RP-2/3 had to be opened in 1985 due to the length of time the coal refuse took to dry before it could be compacted into lifts. RP-4 was opened in 1990 and RP-5A was opened in 1994. In 1998, through TR-42, it was approved to combine the sub-area RP-2/3 and RP-4. This would prolong the life of the refuse pile by giving an additional 274 acre-feet of storage capacity, delay opening of the next refuse pile, eliminate construction and maintenance of two permanent ditches i.e., RP-2/3 west ditch and RP-4 east ditch and result in an easier and more cost effective reclamation of these areas. Map 150 shows the configuration of the combined pit. The existing Ponds RP-2/3 and RP-4 were deepened to contain the 10-year, 24-hour event, and the spillways are adequate to pass the 25-year, 24-hour event. See Maps 79 and 80 and Illustration 44 for SEDCAD runs for ditches, revised ponds, and culvert design. In April, 2020 TR-74 was proposed to facilitate the combination of RP 2/3/4 and RP 5A into RP 2/3/4/5. See Maps 165 and 166 in addition to Illustration 62 for SEDCAD runs for ditches and revised ponds.

As the other active areas near capacity, a new disposal sub-area will need to be developed. RP-A is a proposed sub-area located south of the haul road and east of the overland belt and is shown on Maps 76, and 162. The sub-area is a shorter haul and will result in reduces haulage time and less fuel consumption. See Maps 162, 162A and 163 and Illustrations 59 and 60 for SEDCAD runs for ditches, revised ponds, and culvert design.

In general, as a subarea becomes full, it will be closed and the reclamation will be completed as the subarea adjacent to it is opened. However, more than two subareas may be open at the same time if the refuse handling need (drying and compacting) dictates. As specified in the black-footed ferret reintroduction and management plan, surveys for black-footed ferrets are no longer required of the operator. Federal and state agencies cooperating in ferret recovery have assumed responsibility for conducting appropriate clearance surveys. However, BME is encouraged to continue to appraise BLM and DRMS of surface use activities that may influence ferrets or ferret habitat. The cooperating agencies also encourage BME to participate as an active partner in ongoing ferret monitoring activities. Existing avenues of communication and cooperation between BME and federal/state agencies is considered adequate for the continued protection of this species. Reclamation will be started as soon as the refuse is brought to final grade in the area being worked. The layout of the Refuse Disposal Area is indicated on Map 76. The sub-areas that are already constructed or are in use are shown in greater detail on Map 77, Map 77A and Map 150.

Additionally, two temporary storage areas will be utilized. Area #1 (Map 25) will be used for rotary breaker rock refuse storage pile and Area #2 (Map 26 & 27) for coal and/or coal refuse. Area #1 will contain a maximum of 8,000 tons of material at any on time. Quantities of material stored in Area #2 are limited to that shown in Section IV.C.4.

Prior to actual disposal in the refuse disposal areas, an access road from the haul road will be constructed to the lower portion of the areas and the sedimentation ponds and lower parts of the diversion ditches will be placed. Topsoil from the pond areas will be placed in the topsoil storage pile and all fill material not required for embankment construction will be placed in the nontoxic fill storage pile. Trees and brush will be removed and the topsoil will be stripped and placed in the topsoil storage pile or on a refuse area being reclaimed. The topsoil storage pile will be mulched and seeded. After the topsoil is removed, enough nontoxic fill to meet the minimum cover depth requirement of 30 inches (as per DRMS's approval) will be removed and placed in the nontoxic fill storage pile or on a refuse area being reclaimed. BME will document topsoil/cover soil material balance as future refuse area development and reclamation progresses.

The nontoxic storage piles will be stabilized and seeded to minimize erosion. The nontoxic fill in the storage pile will normally be used for reclamation of the sub-area where removed, but may be utilized on another sub-area if preceding area has been reclaimed during construction of a subsequent sub-area or to help balance excess and deficient subsoil quantities between piles. The topsoil thickness versus area information is given in Appendix IVA.

To minimize the area occupied by the topsoil and nontoxic fill (subsoil) stockpiles the face slopes were set at 3h:1v and 2h:1v, respectively. Since these are relatively steep slopes, the faces of both stockpiles will be roughened or furrowed on the contour prior to reseeding.

A sediment ditch is constructed around the base of both topsoil and subsoil stockpiles. An earthen berm with a rock filter at the low point is installed at the toe of the subsoil pile to drain the runoff collected from precipitation events. The ditches are cleaned as required to maintain their required cross section. See Maps 77.

The procedure followed for Sub-areas RP-1, 2/3 and 4 was repeated for Sub-area 5A. Light utility roads were constructed along the west and east sides of Refuse Area 4 and 5 in order to maintain lights on the power lines. A dozer access crossing was constructed between RP-4 and RP-5A.

The merging of RA-2/3 and RA-4 began during the summer and fall of 1998.

Map 76 shows how refuse lifts are constructed. Refuse is dumped in the area being filled and spread in layers to dry. After drying, the refuse is built into layers not exceeding two feet and compacted to 90 percent of maximum dry density (AASHTO Spec. T99-74) as required by Section 4.10.4. The refuse material has to dry out before it can be compacted properly. During the winter months or at times when the material cannot be properly spread and compacted, the refuse material may be temporarily stored on top of the refuse piles. Storage of refuse material in temporary piles will not exceed 300,000 tons at any one time.

Tests shall be performed on the waste bank to ensure the minimum level of compaction is reached. These tests shall be made in areas that represent the area being compacted. No test will be performed during periods of rain, snowmelt or when the pile is unreasonably wet. Tests shall be performed on a minimum of a monthly basis during the active compaction process of the refuse pile construction. The tests shall be performed with a nuclear density meter.

During the early phase of mine permitting when no actual refuse material was available for testing, the refuse strength and stability characteristics were assumed based on typical scenarios at other sites. Once the actual refuse became available, Western Fuels-Utah (now BME) contracted Lincoln DeVore Laboratories to develop a Proctor curve of the material. Nuclear density equipment was purchased to verify required compaction results. It was found that the original assumptions were quite conservative compared to the actual data. Based upon the actual data, the safety factor exceeds 1.5 using a slope of 3(h):1(v). This factor will be significantly higher for a slope of 4(h):1(v) and 5(h):1(v) as stipulated in the permit. A letter dated January 30, 1987 from Mike Weigand, Chief Engineer at the Deserado Mine supporting the above findings is included as Illustration 42. Additional strength tests on the refuse and stability analysis with a 4:1 slope were conducted by Lincoln-DeVore, Inc. of Grand Junction. The static safety factor was calculated to confirm that it exceeded 1.5. A letter from Lincoln-DeVore is included in Illustration 42A. In 2004 additional cores of the refuse were tested for strength and stability. Based on the new data, Lincoln DeVore concluded that the refuse piles would be adequately stable at 3(h): 1(v) and 200 feet in height. This report is included in Illustration 42B.

Huddlesone-Berry, Inc., of Grand Junction performed a geotechnical investigation of the proposed RP-A area and analyzed the stability of the refuse pile slopes. Every scenario in the analysis resulted in a factor of safety well over 1.5. The report is included as illustration 42C.

Most of the sedimentation ponds in the Refuse Disposal Area will be a combination dug-out or in-situ and embankment type. This design was chosen because of layout and construction considerations. Soils in this area are mostly Turley fine sandy loam and Moyerson silty-clay. The Moyerson soils have properties suitable for dam embankment construction. Where ponds are constructed in in-site materials not suitable for pond construction, suitable materials will be imported from elsewhere within the Refuse Disposal Area and used to construct the required pond embankments. The actual location of suitable construction materials will be determined during field construction by a qualified Geotechnical Engineer or Technician and appropriate field laboratory analysis. A detailed discussion of sediment pond design can be found in Section V-B.

Drainage and sediment control structures will be maintained so that they are stable and functional at all times, until final bond release is approved. See Section IV.J.1 for the control systems. The construction of permanent perimeter ditch in refuse area 2/3/4 and subsequent refuse areas may be delayed until final reclamation. Runoff from active areas typically would not reach these ditches until the soil cover is in place effectively making them unnecessary until this time.

During operation all refuse areas will have interim/inpit ditches as needed to direct runoff during operations. The primary purpose is to ensure that all runoff from disturbed refuse areas is directed away from the fill to the appropriate sediment pond. These ditches are sized in accordance with the referenced designs for the permanent ditches (or other more specific designs if approved) to pass the runoff from a 100-year, 24-hour storm. Illustration 50 provides an explanation of the interim/inpit ditches and appropriate stabilization practices. Stabilization practices may include some or all of the following: (i) temporary rock check dams (see Figure IV-1), (ii) straw bale check dams, (iii) dug out sediment traps (see Figure IV-2), (iv) rip rap or other ditch lining, (v) contour ditching along slopes of refuse areas, and (vi) land imprinting using sheep's foot compactor for refuse area slopes.

Diversion ditches around the perimeter of the refuse disposal sub-areas will intercept runoff from undisturbed areas and either direct it to the sediment ponds or to a natural drainage if the ditch does not collect runoff from waste banks or disturbed areas. Permanent diversion ditches are designed in accordance with the requirements of State Rule 4.10.3(2), 4.09.2(7) and 4.05.4. Permanent diversions are designed to pass the runoff from a 100-year 24-hour storm. The ditches will be designed to carry the design flow depth and 0.3 feet of freeboard in all areas including the riprap sections. See Illustrations 4, 6A, 59, 60, and 62. After reclamation has been completed and the sediment ponds have been removed, the permanent diversion ditches will be blended to drain into the natural drainage where their respective ponds currently discharge. The ditch design will not apply to the western RP-5a ditch collecting undisturbed area diversion since this ditch area will be a part of the future refuse area 5b (RP-5b).

The diversion ditches will not be constructed all at once but will be constructed as needed to properly control runoff from the refuse areas and adjacent undisturbed ground as the refuse piles are enlarged. Ditches will be stabilized with energy dissipation devices such as cobble dams (Figure IV-1) as conditions warrant. Upland diversion ditches will be installed up-slope from the actual working area to catch runoff from the undisturbed area and channel it into the permanent diversion system or away from disturbed areas.

Mined material with a specific gravity greater than 1.6 is considered to be coal processing waste. This is known as "sink" material, and samples of it were submitted to commercial laboratories for chemical analyses as required by the Code of Colorado Regulations (2.04.6(2) and 4.09.1(12)(b). The results of the analyses are included in Appendix 9 of Section II.B.