

for control structures on permanent program lands, are provided in Chapter 12, Appendix 12-F and listed below in Table 12.3.7-1.

Table 12.3.7-1 Drainage Control Structures

Structure Name	Location	Structure Type	Comments
Lowe Corner 3 Drop Structures	NE Lowe	Highwall Drop Structure	Gabion mats and grouted rip-rap
West Lowe Drainage Control Structures	West Lowe	Ephemeral channel	Gabion and rip-rap

In addition to using drainage control structures, where appropriate and feasible, cattle may also be utilized to stabilize reclaimed land and minimize erosion. Cattle grazing will be used to impact reclaimed land to reduce erosion by incorporating mulch and seed into the soil, and increase water infiltration by creating increased surface roughness with cattle hoof action.

12.3.8 Reclamation of Ash Disposal Areas

Between 1971 and January 2008 BNCC placed Coal Combustion Byproducts (CCB) from Four Corners Power Plant (FCPP) in mined-out pits or ramps at Navajo Mine. BNCC does not intend to use CCB materials for future reclamation within the permit boundary. The following permit text is maintained for historical context.

BNCC historically tracked only the locations of the CCB disposal areas and the amount of cover placed over the CCB material. The locations of the CCB disposal areas are presented on Exhibit 11-149. The amount of CCB material disposed of was not tracked, the total volume can be estimated but the degree of accuracy would be questionable.

12.3.8.1 Ash Cover

Following closure of an ash disposal area, a total of three meters of material was used to cover the ash. This three meters of cover includes all topdressing and suitable root zone materials. All reclaimed ash disposal areas incorporated positive drainage.

12.3.9 Use of CCB in Backfilling and Grading

In specific areas of the mine, Coal Combustion By-products (CCB) were used to achieve the FSC. The targets for ash disposal were generally final pits and ramps. The specific permanent program lands are indicated on EXHIBIT 1-4.

Topsoil required to achieve the 5.6 inch depth is placed over the remaining (unmitigated) disturbed surfaces in Area II. This is available in stockpile and in-situ reserves. Area II topdressing material movement is shown on EXHIBITS 12-23 and 12-24.

12.9.2.2.5 Area III

Generally, ramps and pits are used as drainages, spoil material is required from the Dixon Pit area for pit backfill in North Lowe, and Lowe boxcut material is graded to the west. Calculations for material movement and scheduling were performed without the inclusion of Dixon Box-cut Exchange. Pending negotiations with the Navajo Nation, an update will be submitted including the Dixon Box-cut Exchange.

As seen in EXHIBIT 12-13, a considerable volume of material is to be pre-stripped, or truck stripped, before dragline progression into strip DX74. For calculation purposes, this pre-strip volume was removed from the Post Mining Configuration and added to balance the Bond Surface Configuration (BSC) using Microsoft Excel. The pre-strip volume is accounted for in spreadsheet calculations, however the cut block “Dixon PS” is not shown in exhibits.

Cut and Fill contours for Area III are shown on EXHIBITS 12-19. Area III regrade material movement is shown on EXHIBIT 12-22.

Area III topdressing and spoil mitigation material movement required to achieve four (4) feet of rootzone (including 9.7 inches of topsoil) is shown on EXHIBITS 12-25 and 12-28. As with Areas I and II it is assumed that 10.8% of the disturbed surface areas will require mitigation. The remaining surface areas will receive only the 9.7 inches of topdressing.

12.9.2.2.6 Area IV North

Ramps and pits are used as drainages and spoil material is used to backfill designed open

pits and ramps using dozer and front end loader operations. Cut and Fill contours for Area IV North are shown on EXHIBIT 12-30. Area IV North regrade material movement is shown on EXHIBIT 12-30.

Material to achieve the required four (4) feet of suitable root zone material/topdressing is available in stockpile reserves in southern Area III. It should be noted that in realistic scenarios, BNCC will remove topsoil material prior to mining, and stockpile such materials for use in reclamation activities. The Bond calculations however, represent a “Worst Case Scenario”, where BNCC strips without removing topsoil material. In this “Worst Case Scenario”, topsoil would be hauled using trucks from Area III.

The suitable rootzone and topsoil movement consists of the mitigation of four (4) feet of suitable rootzone material over 10.8% of the surface area, with this four (4) foot total inclusive of the required 5.7 inches of topsoil as outlined in TABLE 12-4.

Area IV North suitable rootzone material movement is shown on EXHIBIT 12-30e. Topsoil required to achieve the 5.7 inch depth is placed over the remaining (unmitigated) disturbed surfaces in Area IV North. This is available in stockpile reserves in Area III. Area IV North topdressing material movement is shown on EXHIBIT 12-30d. It should be noted that in realistic scenarios, BNCC will remove regolith material prior to mining, and stockpile such material for use in reclamation activities. The Bond calculations however, represent a “Worst Case Scenario”, where BNCC strips without removing regolith material. In this “Worst Case Scenario”, mitigation material would be hauled using trucks from Area III.

12.9.2.3 Revegetation

After backfilling the pits and ramps the bonded areas will be graded with graders and then these areas and facilities areas will be topsoiled as noted in previous sections. After topsoiling, revegetation activities will initiate. This involves seeding, crimping, mulching and irrigation. Costs are noted on APPENDIX 12-B, Worksheet 14(A-C).