

**SECTION 20**

**MINING OPERATIONS**

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**MINING OPERATIONS**

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**SECTION 20**

**MINING OPERATIONS**

**LIST OF REVISIONS DURING PERMIT TERM**

<b>REV.</b>		<b>DATE</b>
<b>NUMBER</b>	<b>REVISION DESCRIPTION</b>	<b>APPROVED</b>

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## **SECTION 20 MINING OPERATIONS**

### **20.1 Mining Areas and Methods**

Surface coal mining methods adapted for multiple coal seam mining will be used for the Pinabete mine plan. Dragline stripping is the primary overburden removal method used in the Pinabete Mine Plan permit area (permit area). Secondary waste removal methods include truck/loader and dozer stripping operations.

The typical sequence for multiple seam mining is:

1. Vegetation and topdressing removal (where these materials exist)
2. Overburden drilling and blasting
3. Overburden stripping
4. Coal drilling and blasting
5. Coal removal
6. Interburden drilling and blasting
7. Interburden removal
8. Coal drilling and blasting
9. Coal removal

Steps 6 through 9 are repeated for each economically recoverable coal seam.

#### *20.1.1 Vegetation and Topdressing Removal*

Past soil investigations have determined that a negligible topsoil resource exists within the permit area. As such, the material that is suitable for plant growth is considered a topsoil substitute. Materials to be used as topsoil substitute are denoted based upon their *in-situ* location in the soil profile. The material found in the top 60 inches of the soil profile is called “topdressing”, while the material found deeper than 60 inches within the soil profile is called “regolith”.

BHP Navajo Coal Company (BNCC) will salvage all suitable topdressing for use as topsoil substitute. Topdressing will be salvaged from all areas to be affected by surface operations or construction of major structures. However, certain soils cannot be removed without jeopardizing the safety of the operators and equipment or diminishing the quality of the topdressing salvaged. Because of these limitations, topdressing is not salvaged where:

1. Slopes are greater than 4 horizontal to 1 vertical (4h:1v or >25 %)
2. Suitable surface deposits are less than 6 inches (this soil is too shallow to allow removal without considerable contamination from underlying unsuitable material)
3. Areas are less than 1 acre in size (pockets)
4. Areas where rock rims and/or rock outcrops exist



The maximum allowable limit of topdressing removal in advance of the active mining area is 1,800 feet beyond the current extent of mining (e.g., highwall crest). Topdressing is removed far enough ahead of highwall drilling and blasting to prevent contamination from blasting flyrock, and to accommodate mining support infrastructure such as roads and powerlines. In the event that a greater area is needed for topdressing removal, the Office of Surface Mining Reclamation and Enforcement (OSM) will be notified prior to topdressing removal, and the appropriate adjustments to the reclamation bond will be made. The extent of topdressing removal will fully consider and comply with the applicable hydrology performance standards.

The allowable extent of topdressing salvage ahead of active mining (1,800 feet) will allow operational flexibility to utilize opportunistic direct live haul of topdressing, which may result in increased reclamation success. In addition, the permitted extent offers greater flexibility in production operations.

BNCC uses a dedicated fleet to perform all coal haulage, topdressing removal, overburden prestripping, spoil mitigation, interburden removal, regrading, and topdressing replacement activities. Under current manning levels and equipment configurations, BNCC is set up to haul about 6.0 million tons of coal and about 6.0 million cubic yards of other materials annually.

Suitable regolith may be salvaged for use in reclamation as either topsoil substitute or root-zone material, or it may be spoiled if deemed necessary by the operator. Regolith in each resource area (Area 4 North and Area 4 South) will be salvaged or spoiled depending on the need for topsoil substitute or root-zone material in that specific resource area. Where it is practicable to do so, regolith that has been found suitable for use as topsoil substitute will be removed for use as such.

If stockpiling of topdressing and regolith is necessary, the topdressing and regolith will be segregated and stockpiled in separate piles. Stockpiles are discussed in Section 22 (Support Facilities).

Supplemental information regarding topdressing salvage and redistribution operations is presented in Section 36 (Post-Reclamation Soil).

#### *20.1.2 Overburden Drilling and Blasting*

After the suitable topdressing material has been removed, rotary drills are used to drill overburden blast holes. Blast-hole diameter ranges from 5 to 10-5/8 inches. Blast holes are typically drilled to the top of the coal seam being uncovered. To prevent coal shattering and accompanying coal loss from overburden blasting, blast holes are drilled until coal is encountered and backfilled with 1 to 10 feet of drill-hole cuttings. On some cast shots, holes may be drilled to a specified elevation of 3 to 7 feet above the coal seam and not backfilled to reduce coal loss due to the movement of the overburden over the coal seam.

Once the rotary drill has completed drilling a block of blast holes, the holes are loaded with bulk explosives (typically ammonium nitrate and fuel oil [ANFO], an emulsion and ANFO blend, or bagged slurry product). The explosive column is detonated by a ½-pound to 3-pound primer initiated with either a nonelectric detonating cord, nonelectric blasting caps, or electronic/electric blasting caps. To ensure proper blast sequencing and minimize adverse effects, the shots are typically controlled using in-hole delays and/or surface delays.

### *20.1.3 Overburden Stripping Methods*

Overburden and interburden materials (commonly referred to “spoil” after removal by stripping operations) are removed primarily with walking draglines. The coal seams in the permit area are exposed in parallel cuts commonly referred to as “strips”. A “pit” is a mining area comprised of a generally contiguous sequence of strips. Strips will vary in width as a function of the size and capability of the dragline operating in a given pit. Pit depths (measured from the topographic crest to the toe of the highwall) will vary from 5 to 250 feet, dependent on the stratigraphic location of recoverable coal seams and other operating constraints. Pit lengths will vary from several hundred to 20,000 feet, dependent on pit geometry and planned mining sequence.

In most cases, a minimum pit width of 100 feet is required to facilitate safe operation of the mobile mining equipment. Overburden and interburden is removed using the dragline in a series of blocks, the length of which depends on the particular pit geometry. The typical strip layout ([Figure 20.1-1](#)) demonstrates how spoil material is spoiled into the previously mined-out strip.

Two methods of dragline stripping are typically employed by BNCC. The first is conventional side casting, which is generally used on the upper seams. The second is conventional spoil-side stripping, which is used on the lower seams. Geologic conditions, such as depth of coal and the number of coal seams, along with the size of the dragline and its basic configurations determine the methods of stripping employed in any given pit.

In addition to primary dragline stripping, dozers and trucks are utilized in overburden and interburden removal operations as required. Dozer and truck stripping is utilized to buffer inventory lows and to remove overburden in isolated areas where dragline stripping is not practical (e.g., mesas, pits with very short lengths, constrained spaces, etc.). Trucks and dozers are also utilized within dragline pits on thin burdens where dragline operations are not effective.

The progression of uncovered coal is in linear strips as shown on [Exhibit 20.1-1](#). Information regarding the areas mined by years, compiled from [Exhibit 20.1-1](#) is presented in [Table 20.1-1](#). This table summarizes pit locations, mining sequences, start and end dates of mining, and approximate number of acres disturbed.

#### *20.1.4 Coal Removal*

##### 20.1.4.1 Coal Drilling and Blasting

After the coal is exposed by stripping operations, the top of the coal is cleaned using small front-end loaders. The diluted coal is piled on the spoil side of the pit and left behind. The coal seam is then drilled in preparation for blasting. Thin coal seams are typically ripped with dozers, rather than blasted. The holes are typically loaded with ANFO, with an emulsion/ANFO blend, or bagged slurry product. The explosive column is detonated by a ½-pound to 3-pound primer initiated with either a nonelectric detonating cord, nonelectric blasting caps, or electronic/electric blasting caps. Surface or in-hole delays are used to ensure proper blast sequencing.

##### 20.1.4.2 Coal Removal

Once the coal is blasted or ripped it is removed (mined) using large front-end loaders, which load large-capacity haul trucks. The entire thickness of the coal seam is mined in one pass except where an included parting or coal quality makes a distinct division in the coal seam. In this case, the top part of the seam is mined by the front-end loader, the parting is ripped by dozers and pushed into the adjoining spoil area, and the rest of the seam is mined with the front-end loaders.

Although operations are engineered and planned to recover the maximum amount of coal, a small percent of coal is lost as wedges and ribs, and at the top and bottom of coal seams. There are a number of operational and safety-related conditions that necessitate limited coal losses. In general, two types of wedge losses occur: a wedge left on upper seams in multiple-seam pits as a safety berm, and a wedge left on spoil-encroached seams as a spoil barrier.

Upper seams are mined from benches where the bottom of the coal elevation is higher than the toe of the spoil. When these conditions are encountered, a wedge of coal is typically left as a safety berm intended to prevent equipment from accidentally going over the highwall. Once the coal seam has been mined out, front-end loaders are used to recover as much of the wedge as safe operating practices allow.

When a seam is spoil-encroached, the coal wedge acts as a spoil barrier, contributing to spoil stability and reducing the occurrence of loose material rolling into the active mining face. Both spoil slides and loose material rolling into the pit are potentially serious safety hazards. Once the seam has been mined out, front-end loaders are used to recover as much of the spoil-side wedges as safe operating practices allow.

A small percentage of coal may be lost on the top and bottom of the coal seam and as coal ribs due to the geologic condition of the coal and due to the equipment utilized in the stripping and mining sequences.

In most cases, the coal is loaded into large-capacity haul trucks that travel up the pit ramps to the primary haulroads for delivery to field stockpiles. In extraordinary circumstances coal may be hauled directly to the coal processing plant located adjacent to the power plant.

Front-end loaders are used at the field stockpiles to load the coal into rail cars for dumping at the processing plant. Normally, one electric locomotive pulls sixteen to twenty cars from the stockpiles to the processing plant.

BNCC is in negotiations with the owners of the Four Corners Power Plant (FCPP) to establish a long-term contract that would provide coal for the power plant. The tonnage per year delivered to the power plant is subject to change depending on demand for power, the availability of the mining equipment, and possible additional sales generated through future contracts. The tonnage anticipated to be mined from the permit area during the first permit term is discussed in Section 20.3.

#### *20.1.5 Steep Slope Mining*

This section is not applicable.

#### *20.1.6 Auger Mining*

This section is not applicable.

#### *20.1.7 Surface Mining Near Underground Mines*

This section is not applicable.

### **20.2 Major Equipment to Be Used**

The major mining equipment used in production operations within the permit area is listed in [Table 20.2-1](#). The types and number of equipment are subject to change during the permit term due to fluctuations in production levels, equipment outages, and equipment replacement schedules.

### **20.3 Coal Production**

BNCC is in negotiations with the owners of the Four Corners Power Plant (FCPP) to establish a long-term contract that would provide a supply of coal over a period of years specified in the contract. The anticipated tonnage to be mined from the mining areas (Areas 4 North and Area 4 South) for each calendar year of the initial permit term and each five-year period beyond the initial permit term is presented in [Table 20.3-1](#).

Annual total tonnage may be subject to change depending on the demand for coal and availability of mining equipment. [Exhibit 20.1-1](#) shows the areas anticipated to be mined during the permit period.

## **20.4 Special Materials-Handling and Disposal Procedures**

### *20.4.1 Acid-Forming and Toxic-Forming Materials and Combustibles Handling Plan*

During mining operations in the permit area, BNCC may encounter strata that contain limited quantities of potentially acid- and toxic- forming materials (PATFM). Based on the geologic description and the overburden characterization in Section 17 (Geologic Information), the quantity of PATFM will be minimal and thus does not require special handling and disposal procedures. Section 17 presents data for the physical and chemical properties of overburden within the permit area and discusses the PATFM strata that will be encountered during mining operations.

As discussed in Section 20.5, BNCC will not generate or dispose of coal mine or coal processing wastes in the permit area. BNCC may place small quantities of coal and coal materials that do not meet quality standards (e.g., low BTU) in mined-out areas. These small quantities of coal may come from the coal transfer and storage facilities, coal stockpiles, or other incidental areas of the mine. This coal material represents a low combustion risk, but in the event the material does combust, BNCC will follow the procedures discussed in the combustibles and coal mine waste fire control plan presented in Section 20.9. Section 34 (Post-Reclamation Topography) describes the procedures that may be used for burying or covering PATFM and combustibles not suitable for supporting plant growth encountered during reclamation operations.

## **20.5 Coal Mine Waste Disposal**

Mining operations will not generate coal mine waste. BNCC operates coal sizing, coal conveyor, and coal handling and blending facilities however, those facilities are not located within the permit area.

BNCC will not generate coal processing waste, as defined by 30 CFR 701.5; however, small quantities of coal materials are routinely cleaned up around the mine operations and placed in mined-out areas. Small quantities of coal not meeting contract specifications may also be placed in mined-out areas in a manner that protects environmental resources. The volume of coal material generated during routine cleanup is expected to be small. Therefore BNCC does not have a designated disposal location. Rather, these materials will be hauled to a mined-out area and free-dumped along the bottom of the pit or in an alternate location where the materials will not adversely affect reclamation operations. The small volumes of coal waste material will be buried; therefore the surface drainage or final surface configuration will not be impacted. BNCC does not plan to dispose of coal mine waste in banks, refuse piles, waste dams, impoundments, or underground workings. BNCC does not plan to accept coal mine waste from outside the

permit area. Refer to Section 17 (Geologic Information) for physical and chemical information on the coal seams that will be mined.

### **20.6 Non-Coal Mine Waste Disposal**

In compliance with Navajo Nation Environmental Protection Agency (NNEPA), Navajo Nation Solid Waste Regulations Part II §202, all non-coal mine waste, including “solid waste”, as defined in Navajo Nation Solid Waste Regulations Part I §105 LL, and materials classified as hazardous waste are removed from the mine site for disposal. Nonhazardous, non-coal solid waste/trash and refuse (e.g., paper, cardboard, office trash, tires, lumber, concrete, etc.) are accumulated, managed, and disposed of or recycled in accordance with applicable U.S. Environmental Protection Agency (USEPA), NNEPA, and New Mexico Department of Transportation regulations. Solid waste generated by BNCC is stored in dumpsters located at various designated areas around the mine site and transported by a third-party contractor to the San Juan County Regional Landfill or other permitted solid waste landfill on a regular schedule. [Appendix 20.A](#) contains a copy of the Certificate of Registration for San Juan County’s Regional (Crouch Mesa) Sanitary Landfill, demonstrating it is a permitted facility in compliance with Section 103 of the New Mexico Environmental Improvement Board, Solid Waste Management Regulations.

Special wastes, such as used sorbents and oily rags, are accumulated, managed, and disposed of in accordance with applicable USEPA, NNEPA, and Department of Transportation regulations. These special wastes are transported by a third-party contractor to the San Juan County Regional Landfill for appropriate handling and disposal. An example of BNCC’s special waste profile is provided in [Appendix 20.B](#). Special waste profiles and manifests, along with sampling and analysis records, are maintained by the BNCC Environmental Quality Department and are available for review at the request of the regulatory authority.

Hazardous materials are accumulated, managed, and disposed in accordance with applicable USEPA, NNEPA, and Department of Transportation regulations. BNCC will obtain and maintain an USEPA Identification (ID) number and submit the required forms to USEPA as required under Resource Conservation and Recovery Act (RCRA) regulations to obtain and maintain a RCRA ID number. The RCRA ID number will be used on all transport manifests and any other hazardous waste management documents required by Subtitle C of RCRA. Hazardous waste manifests along with sampling and analysis records are maintained by the BNCC Environmental Services Department and are available for review at the request of the regulatory authority.

BNCC may establish a landfarm within the permit area to bioremediate petroleum-contaminated soils that are collected on-site. The selected landfarm site will be included on an exhibit and a description of the

landfarm will be included in Section 22 (Support Facilities) of this permit application package, should BNCC decide to have a landfarm in the permit area.

### **20.7 Protection From Slides**

This section is not applicable.

### **20.8 Blasting Operations**

#### *20.8.1 Blasting Plan*

##### 20.8.1.1 Blasting Operations

BNCC complies with the following laws governing the use of explosives where applicable:

- 26 CFR Part 181 "Commerce in Explosives"
- 30 CFR Part 77 "Mine Safety and Health Regulations"
- 30 CFR Part 816 "Permanent Program Performance Standards - Surface Mining Activities"

All blasting is conducted under the supervision of OSM-certified blasters. The blaster and one other person present at the firing of a blast and all personnel responsible for blasting operations will be familiar with the blasting plan and site-specific performance standards.

BNCC will prepare and submit a blasting design before blasting within 1,000 feet of any dwelling, public building, school, church, or community or institutional building outside the permit area or within 500 feet of an active or inactive underground mine. The design contains drill patterns, delay periods, tie-in description, amount and type of explosives used, and pertinent data describing the scaled distance considerations used to minimize the risk of damage to structure(s) closest to the blast. These blasting designs are submitted to the regulatory authority as part of a permit application or before the scheduled date of the blast. Appropriate changes will be made to these designs as required by the regulatory authority.

The location and design of the explosives handling and storage areas are discussed in Section 22 (Support Facilities).

##### 20.8.1.2 Blasting Signs, Warnings, and Blast Area Access Control

Signs posted conspicuously at all public road entrances contain the following warning: "WARNING! EXPLOSIVES IN USE". The signs list the audible blast warning signals and the physical methods used to control blast area access. These signs also indicate that "Loaded Holes Are Barricaded and Marked with Warning: DANGER- EXPLOSIVES-KEEP OUT".

The audible warnings described on the blast warning signs will be audible within a range of one-half mile from the point of the blast.

Access to the general area where blasting is planned or where holes are being loaded in advance of a blast is controlled by signs posted stating the blasting activities. These are typically temporary signs reading "DANGER EXPLOSIVES - LOADED HOLES - NO UNAUTHORIZED ENTRY - CALL BLAST FOREMAN BEFORE ENTERING" or a similar message to warn the party reading the sign.

Access to the area of potential impacts (primarily from flyrock) surrounding a blast is controlled by manned roadblocks that deny access by unauthorized personnel. Access is denied prior to the actual blast and not allowed until the area is cleared after the blast.

#### *20.8.2 Preblasting Survey*

BNCC notifies in writing all known residents located within one-half mile of the permit area on how to request a preblast survey. All preblast surveys requested more than 10 days before the planned blasting activities are to be completed prior to the commencement of blasting activities. A list of all known residences within one-half mile of the permit area is included in [Appendix 20.C](#). A map showing the blast areas to be described in the public blast notice and the location of all known residences can be found on [Exhibit 20.8-1](#).

#### *20.8.3 Blasting Schedule*

BNCC will publish and distribute the public blast notice and schedule, per 30 CFR 816.64(b), after OSM's final agency decision on the permit application package (PAP) at least 10 days and no more than 30 days prior to initiating the blasting program. BNCC has prepared a draft public blast notice and schedule and included it as [Appendix 20.D](#). The public blast notice will include the following: 1) name, address, and telephone number of BNCC; 2) identification of the specific areas where blasting may take place; 3) dates and time periods when blasts are to take place; 4) methods used to control access to the blasting areas; and 5) type and patterns of audible warning and all-clear signals to be used before and after blasting. After publication of the public blast notice, the PAP will be updated to include the notice and distribution list in [Appendix 20.D](#).

All blasting shall conform to the blasting schedule as described in the public blast notice ([Appendix 20.D](#)) except for emergency situations. Emergency situations warranting blasting outside the specified periods include any situation that constitutes a safety hazard to employees, a safety hazard to the public, and/or has the potential to damage equipment, property, or otherwise.

The public blast notice is to be published at least 10 days, but not more than 30 days, before blasting, and at regular intervals that will not exceed 12 months. BNCC will also re-publish the public blast notice when the information (e.g., area or schedule), changes significantly from the previous published public blast notice. Copies of the public blast notice will be distributed to local governments, public utilities, and each



residence within one-half mile of the blasting area. A copy of the public blast notice is shown in [Appendix 20.D](#). Proof of publication of the public blasting notice will be kept on the mine site at all times and may be reviewed by the regulatory authority upon request.

#### *20.8.4 Blasting Monitoring System*

##### 20.8.4.1 Control of Adverse Effects

Blasting is conducted so that air blast does not exceed the limits prescribed in 30 CFR 816.67(b)(i) at any dwelling, public building, school, church, or community or institutional building outside the permit area. BNCC periodically monitors air blast to insure compliance with the standards.

All blasts are designed to prevent the likelihood that flyrock will travel beyond the blast area, more than one-half the distance to the nearest occupied building or dwelling, or outside the permit area.

Blasting is conducted so that the maximum ground vibration does not exceed the limits prescribed in 30 CFR 816.67(d)(2)(i) at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area. To ensure that the maximum peak particle velocity for ground vibration is not exceeded, the scale-distance equation as described in 30 CFR 816.67(d)(3) is utilized.

Seismic monitoring will not be required when blasting is performed in accordance with the scale-distance equation. When application of the scale-distance equation shows that the allowable peak particle velocity may be exceeded, seismic monitoring will be conducted using a seismograph. The data will be included in the blast report for this particular shot.

#### *20.8.5 Blasting Records*

All blasting data are recorded on blast reports that are retained at the mine offices for three years. Blasting records will contain the information required by 30 CFR 816.68.

#### *20.8.6 Blasting Near Protected Structures and Underground Mines*

It is not anticipated that structures other than those mentioned above will be encountered. In the event that other structures are encountered, such as powerlines, pipelines, water towers, tunnels, dams, impoundments, underground mines, or other utilities, a maximum peak particle velocity limit will be developed to use in the vicinity of the structure. After obtaining regulatory authority approval, one of the above-mentioned methods will be used to show that the maximum allowable peak particle velocity limit is not exceeded at the location of the structure.

The maximum air blast and ground vibration limits will not apply at structures owned by BNCC and not leased to another person.

### **20.9 Combustibles and Coal Mine Waste Fire Control Plans**

The mining operations do not generate any coal mine waste; therefore, no coal refuse piles have been constructed. Future plans do not require the construction of refuse piles, therefore, a MSHA coal mine waste fire control plan is not required, per 30 CFR 77.214 through 77.215(4).

Fires caused by the inclusion of stringer coal or carbonaceous shale in the dragline spoil occasionally occur in the spoil rows and previously mined areas of the pits. Spoil fires are controlled or extinguished by covering the burning spoil with non-coal spoil material to smother the fire. Coal spoil fires that cannot be covered will be manipulated with a dozer to expose the coal spoil material, allowing it to burn itself out.

If a coal stockpile fire occurs, the burning coal is removed from the pile and spread out on the ground away from the pile. The fire is smothered by back dragging the material with mine equipment or is left spread out to burn itself out.

Extinguishing operations will be initiated immediately after a coal spoil/stockpile fire is reported. Coal fires are carefully evaluated and deemed safe before equipment and personnel are allowed to enter the area for extinguishing operations. Only experienced personnel conduct extinguishing operations. Coal fires are monitored until all evidence indicates that the fire has burned itself out or is extinguished.

To ensure safe working conditions, all work areas are inspected at least once during each work shift by the supervisor in charge of the work area. An inspection log is maintained, with follow-up actions for any unsafe conditions that are identified. This shift inspection is required by MSHA. Any potential fire hazard(s) and, if appropriate, the corrective action(s) taken are identified and reported during this inspection by the on-shift supervisor.

### **20.10 Certification of Designs and Exhibits**

All certified exhibits for this section of the PAP are available for review upon request at the mine office or OSM, Western Region, technical office in Denver, Colorado. Certified as-built drawings will be kept on file at the mine site and made available upon request.

#### *Personnel*

Persons or organizations responsible for data collection, analysis, and preparation of this permit application package section:

Ron Van Valkenburg  
Dustin Fisher  
Kent Applegate  
Matt Owens  
BHP Navajo Coal Company

*References*

Table 20.1-1 Acres Disturbed by Year

Permit term	Year(s)	Acres disturbed
1	1	100.9
	2	115.1
	3	88.9
	4	87.6
	5	88.8
2	6-10	746.4
3	11-15	512.4
4	16-20	636.6
5	21-25	367.6
Total		2,744.3

Table 20.2-1 List of Major Mining Equipment Used for the Pinabete Mine Plan

Equipment type	Number typically in use <sup>1</sup>
Draglines	3
Overburden drills	3
Coal drills	2
Track dozers	13
Rubber-tired dozers	2
Large front-end loaders	7
Small front-end loaders	4
Graders	6
Coal haulers	5
End dumps	7
Mix trucks	2
Water trucks	4
Cable reels	2
Locomotives	4
Railroad Cars	42

<sup>1</sup> The types and number of equipment are subject to change during the permit term due to fluctuations in production levels, equipment outages, and equipment replacement schedules.

Table 20.3-1 Anticipated Coal Production (Tons Mined) by Year

Permit term	Year(s)	Tons mined
1	1	6,276,000
	2	5,380,000
	3	5,303,000
	4	6,178,000
	5	5,858,000
2	6-10	29,290,000
3	11-15	29,290,000
4	16-20	29,290,000
5	21-25	17,574,000
Total		134,439,000

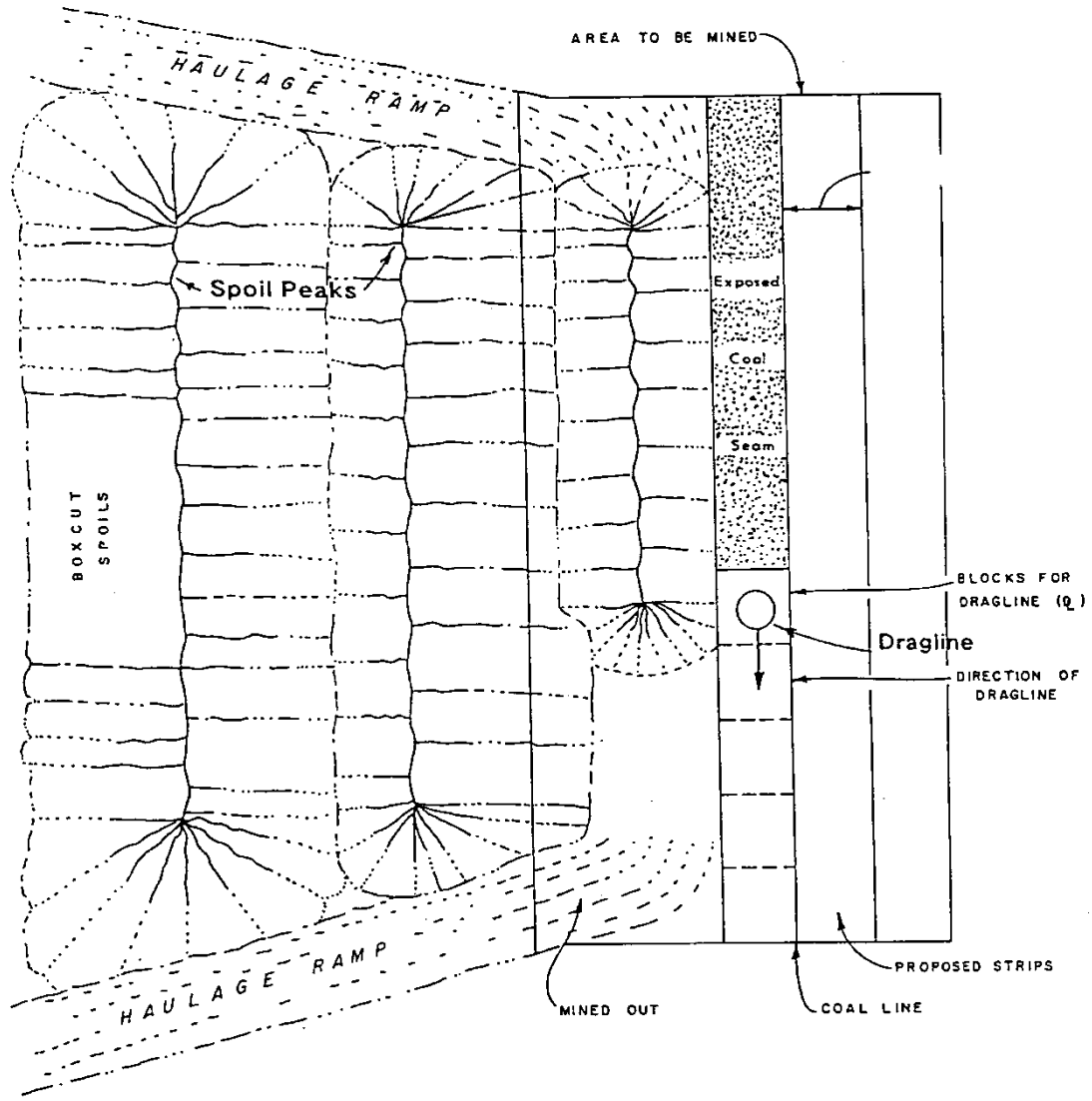
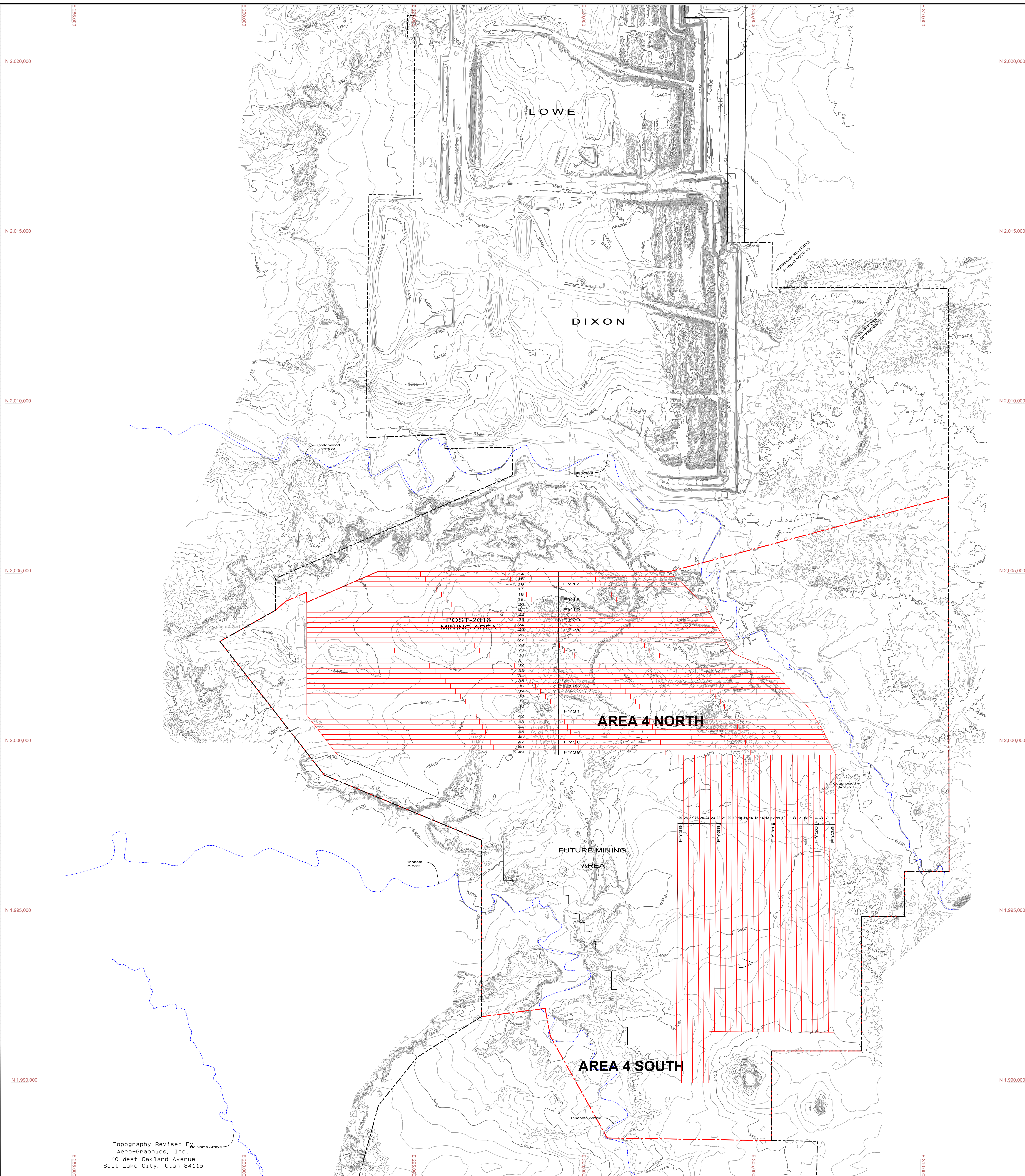


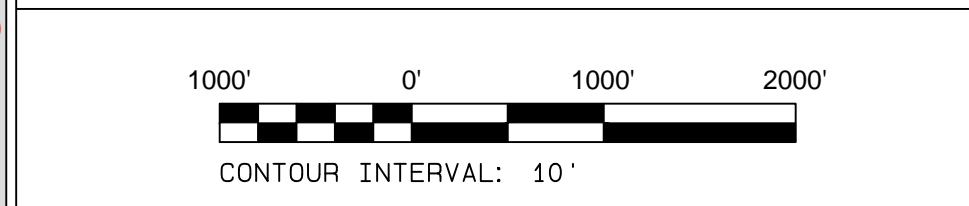
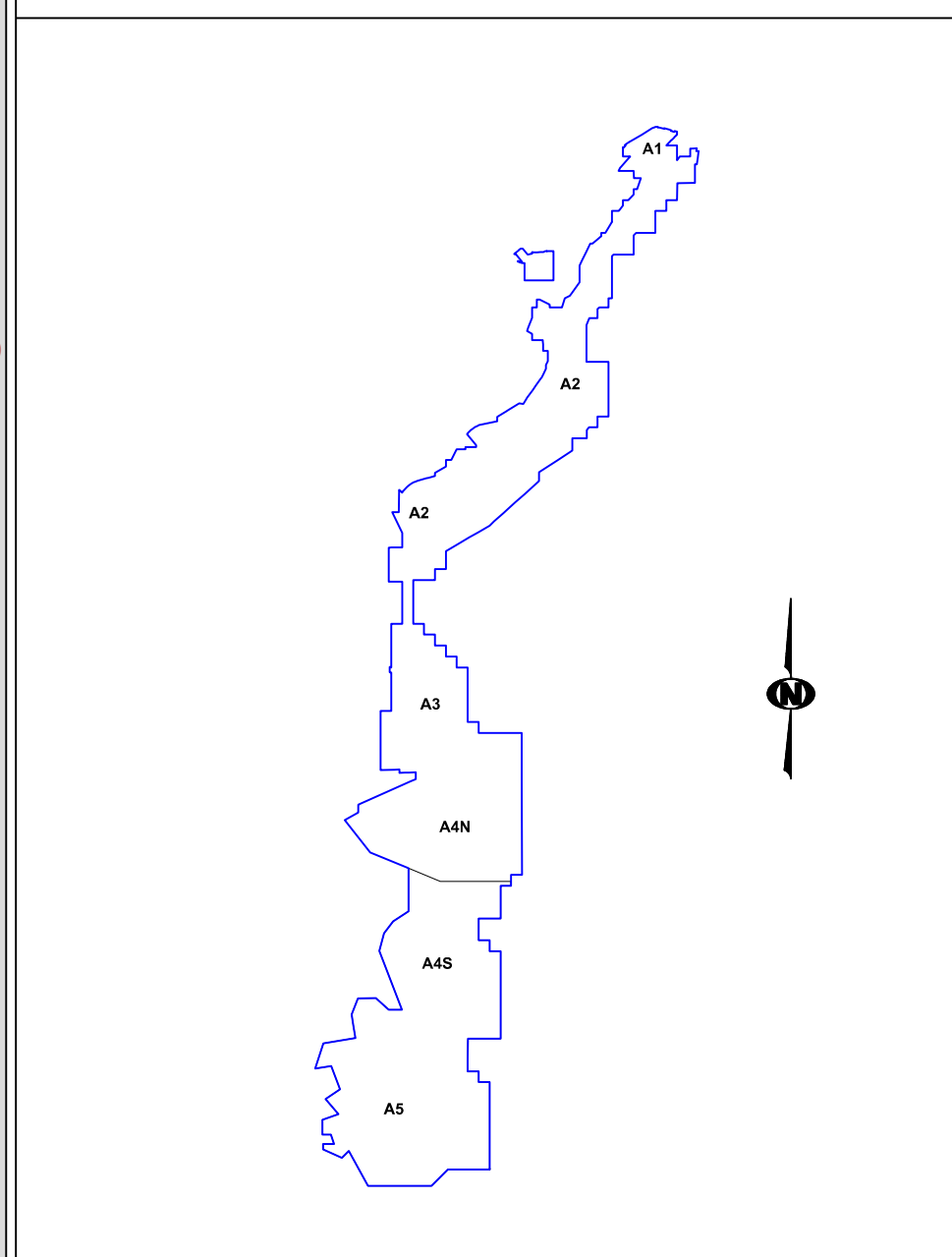
Figure 20.1-1 Typical Strip Layout





**LEGEND**

- PAVED ROAD
- DIRT ROAD
- HAUL ROAD
- TRAIL
- BUILDING
- FENCE
- IRRIGATION LINE
- CULVERT
- DAM
- DRAINAGE
- RAILROAD
- STEAM BUFFER ZONE
- POWERLINE
- SPOT ELEVATION
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- HORIZ. & VERT. CONTROL
- LEASE CORNER
- LEASE BOUNDARY
- POST-2016 PERMIT BOUNDARY
- MONITORING SITES



**"NOTE"**  
 ADDITIONAL MINE STRUCTURES, INCLUDING ROADS, RAILROAD, PONDS, IMPOUNDMENTS AND CULVERTS, ALTHOUGH PRESENT ON THIS EXHIBIT AS PART OF AERIAL BASE MAPPINGS, ARE NOT INTENDED TO BE CURRENT OR ACCURATE ON THIS EXHIBIT. PLEASE REFER TO THE APPROPRIATE P.A.P. TEXT SECTION FOR A MINE STRUCTURE EXHIBIT REFERENCE.

REV. NO.	DATE	DRAFT BY	REVISION DESCRIPTION	ENG.	E.S.	PE	APPROVALS
02-4	Feb-2012	RY	Submitted for Pinabete Permit	RCV	MO	RCV	

**CERTIFICATION STATEMENT**  
 I, Ron C. Van Valkenburg, hereby certify that this drawing was reviewed by me and that the information shown is complete and accurate to the best of my knowledge.

Original certified signed exhibits are maintained at the mine site and at OSM.

**EXHIBIT 20.1-1**



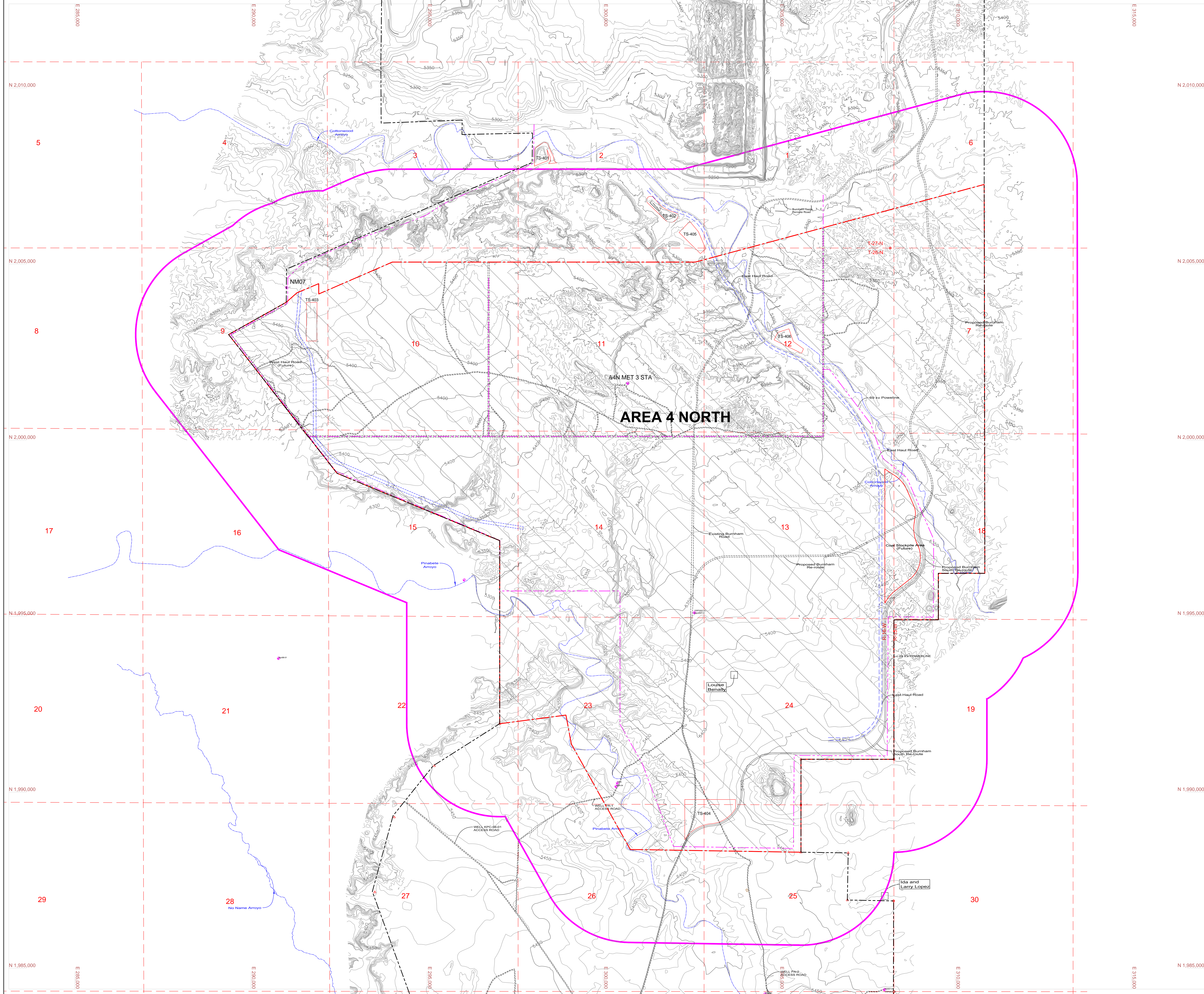
**BHP NAVAJO COAL COMPANY**  
 P.O. BOX 1717 FRUITLAND, NEW MEXICO 87416 PHONE (505) 598-4200 FAX(505) 598-4229

**PINABETE PERMIT PERMIT TERM DISTURBANCE SCHEDULE**

PREPARED BY	RV	DRAWN BY	RY	SCALE:	1"=1000'
APPROVED BY		DATE	Feb 2012	Sheet	1 of 1

Topography Revised By:  
 Aero-Graphics, Inc.  
 40 West Oakland Avenue  
 Salt Lake City, Utah 84115

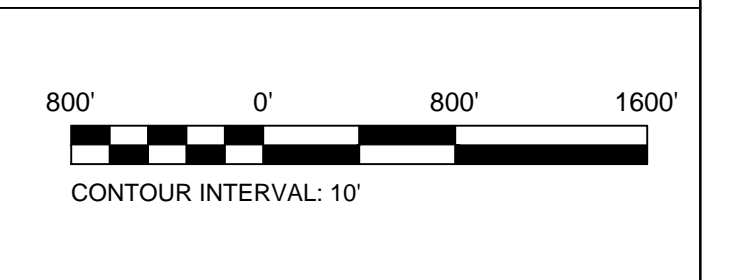




**LEGEND**

- PAVED ROAD
- DIRT ROAD
- HAUL ROAD
- TRAIL
- BUILDING
- FENCE
- IRRIGATION LINE
- CULVERT
- DAM
- DRAINAGE
- RAILROAD
- TREES
- POWERLINE
- SPOT ELEVATION
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- 216 5422.45 HORIZ. & VERT. CONTROL
- L-30 LEASE CORNER
- LEASE BOUNDARY
- POST-2016 PERMIT BOUNDARY
- MONITORING SITES
- BLASTING AREA

N



Topo Revised by  
**Aero-Graphics, Inc.**  
 2930 South West Temple  
 Salt Lake City, Utah 84115

NOTE:  
 TOWNSHIP, RANGE AND SECTION ARE  
 PROJECTED FROM NAD 27, NEW MEXICO WEST,  
 US FEET TO NAD 83 NEW MEXICO WEST, US  
 FEET.

11A	DATE	BY	DESCRIPTION	REV	NO	REV	DATE
			PREPARED FOR SUBMITTAL TO CGM				

Original certified signed exhibits are maintained  
 at the file site and at CGM.

**CERTIFICATION STATEMENT**  
 I, Ron C. Van Valkenburg, hereby certify that this drawing  
 was reviewed by me and that the information shown is  
 complete and accurate to the best of my knowledge.



**EXHIBIT 20.8-1**  
**BHP NAVAJO COAL COMPANY**  

 P.O. BOX 1717 PHOENIX, ARIZONA 85001  
 PUEBLO, NEW MEXICO 87416 PHONE: 505.938.4200  
 FAX: 505.938.4201

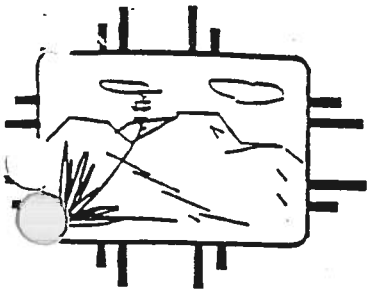
**PINABETE PERMIT  
 BLASTING AREA  
 LOCATION MAP  
 (SHEET 1 OF 1)**

PREPARED BY: [ ] DRAWN BY: [ ] SCALE: 1"=800'  
 APPROVED BY: [ ] DATE: Nov 2011 Sheet 1 of 1



## **Appendix 20.A**

Certificate of Registration for San Juan County Regional Landfill to the State of New Mexico (1988)



NEW MEXICO  
HEALTH AND ENVIRONMENT  
DEPARTMENT

Post Office Box 968  
Santa Fe, New Mexico 87504-0968

COMMUNITY SUPPORT BUREAU  
SOLID WASTE MANAGEMENT UNIT

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

### CERTIFICATE OF REGISTRATION

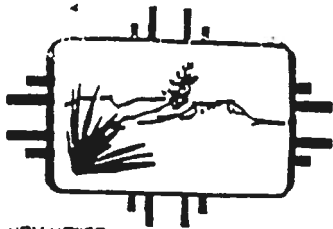
This is to certify that San Juan County's Crouch Mesa Sanitary Landfill has filed an application with the Environmental Improvement Division in compliance with Section 103 of the New Mexico Environmental Improvement Board, Solid Waste management Regulations.

DATE: January 21, 1988

  
Philip L. Westen  
Certification Officer

#### COMMENTS:

See attached letter



NEW MEXICO  
HEALTH AND ENVIRONMENT  
DEPARTMENT

Post Office Box 968  
Santa Fe, New Mexico 87504-0968

ENVIRONMENTAL IMPROVEMENT DIVISION

Michael J. Burkhart  
Director

GARREY CARRUTHERS  
Governor

LARRY GORDON  
Secretary

CARLA L. MUTH  
Deputy Secretary

Certified/Return Receipt Requested

January 21, 1988

Mr. C. C. Cash  
Director of Public Works  
San Juan County  
112 S. Mesa Verde  
Aztec, New Mexico 87410

Dear Mr. Cash:

Enclosed is a Certificate of Registration for your landfill located on Crouse Mesa.

It is recommended that upon completion and final closure of the landfill, that notification is submitted to the County Assessor's Office indicating this parcel of land was used as a landfill. The notification should be placed in any file that would be reviewed in a title search or when the property is sold. A copy of the notification should be sent to this office.

Finally, it should be noted that compliance with the New Mexico Solid Waste Management Regulations will not assure compliance with regulations under the Resource Conservation and Recovery Act.

If you have any questions, please feel free to contact Phillip Westen at 827-2780.

Sincerely,

  
Jon F. Thompson, Chief  
Community Services Bureau

cc: Richard Mitzelfelt, Chief, Groundwater Bureau  
Tito Madrid, Albuquerque District I Manager  
Dave Tomko, Health Program Manager - Farmington  
Thomas W. Merlan, State Historic Preservation Officer  
Nicholas J. Black, State Land Office

R. E. KARLIN  
Chairman

ROBERT A. SMITH  
Chairman Pro Tem

DONALD BENALLY  
Member

MICHAEL B. SULLIVAN  
Member

QUINCY C. CORNELIUS  
Member



JIM NEBLETT  
Manager  
505-334-9481

## San Juan County

112 S. MESA VERDE  
AZTEC, NEW MEXICO 87410

January 15, 1988

Philip L. Westen  
Environmental Scientist  
New Mexico Health and Environmental Department  
Environmental Improvement Division  
P. O. Box 968  
Santa Fe, New-Mexico 87504-0968

Re: Proposed Landfill

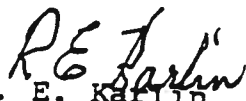
Dear Mr. Westen:

In response to Mr. Mitzelfelt's latest communication dated January 8, 1988, this letter will be considered an amendment to San Juan County's Crouch Mesa landfill application which was sent to your office on September 2, 1987.

Access to the Crouch Mesa landfill will be controlled by a guard at the gate during normal hours of operation. All vehicles with refuse entering the landfill will be monitored. No liquid wastes or industrial process wastes will be allowed to be disposed of at the site.

Since we are under a February 1, 1988 closure by the Bureau of Land Management of our present landfills, I hope this amendment will suffice to receive immediate approval on our landfill application.

Sincerely,

  
R. E. Karlin, Chairman  
Board of County Commissioners

REK:cr

cc: Governor Garrey Carruthers  
Richard Mitzelfelt, Chief  
Ground Water Bureau

## **Appendix 20.B**

Special Waste Handling Profile with Waste Management (2009)

Location of Original WESTERN REGION LAB

I. Generator and Facility Information

Decision Site San Juan Landfill  
Proposed Management Facility San Juan Landfill

Tracking #: 5613960 Priority : SJ  
Profile # : 09391B Date Received: 02/23/09  
Effective Date: 05/13/09  
Generator : BHP COAL NEW MEXICO  
Waste Category Code:  
Description : PC ABSORBENTS/HOSES/FILTERS/PL

\*\*\* This Decision is APPROVED

II. Decision to Deny Approval for Management of Waste

Reason for Denying Approval

Final Approval \_\_\_\_\_ Name (print) \_\_\_\_\_ Date \_\_\_\_\_

III. Decision to Approve

Approved

a) Approved Management Methods

DIRECT LANDFILL. ..  
. ..

b) Precaution Conditions or Limitations on Approval

\* WASTE MANAGEMENT MUST BE INFORMED IF THE WASTE CHARACTERISTICS OF PROCESS CHANGE. CHANGES TO BE APPROVED ON A CASE-BY-CASE BASIS. ..

\* GENERATOR OR ITS AUTHORIZED AGENT HAS CERTIFIED THAT NO HAZARDOUS WASTE CODES, PCBS, OR OTHER PROHIBITED WASTES ARE ASSOCIATED WITH THIS WASTE STREAM. ..

THIS WASTE IS A NM SPECIAL WASTE (INDUSTRIAL WASTE). THE FOLLOWING ADDITIONAL REQUIREMENTS APPLY:

\* A MANIFEST MUST ACCOMPANY ALL LOADS OF SPECIAL WASTE IN ACCORDANCE WITH NMAC 20.9.8.19.

\* ALL DRUMS OR CONTAINERS MUST BE CLEARLY LABELED OR MARKED INDICATING THE NAME AND ADDRESS OF THE GENERATOR, CONTENTS, POTENTIAL HEALTH, SAFETY, AND ENVIRONMENTAL HAZARDS ASSOCIATED WITH THE WASTE AS PER NMAC 20.9.8.10(d). ..

WASTE MUST BE ABSENT FREE LIQUIDS. ..

USED OIL FILTERS MUST BE NON-TERNE PLATED (\*), AND GRAVITY HOT-DRAINED(\*\*) USING ONE OF THE METHODS LISTED IN 40 CFR 261.4(b)(13)(i); (ii); (iii); (iv). ..

USED OIL FILTERS MAY NOT BE MIXED WITH WASTES LISTED IN SUBPART D OF 40 CFR 261. ..

\* TERNE IS AN ALLOY OF LEAD AND TIN. ..

\*\* DRAINED IS INTERPRETED BY USEPA TO MEAN "AS A PRACTICAL MATTER, IF AN OIL FILTER IS PICKED UP BY HAND OR LIFTED BY MACHINERY AND USED OIL IMMEDIATELY DRIPS OR RUNS FROM THE FILTER, THE FILTER SHOULD NOT BE CONSIDERED TO BE DRAINED. ..

HOT DRAINED MEANS TO DRAIN THE FILTER IMMEDIATELY UPON REMOVING IT FROM THE EQUIPMENT.

Location of Original WESTERN REGION LAB

I. Generator and Facility Information

Decision Site San Juan Landfill  
Proposed Management Facility San Juan Landfill

Tracking #: 5613960 Priority : SJ  
Profile # : 09391B Date Received: 02/23/09  
Effective Date: 05/13/09  
Generator : BHP COAL NEW MEXICO  
Waste Category Code:  
Description : PC ABSORBENTS/HOSES/FILTERS/PL

\*\*\* This Decision is APPROVED

III. Continuation.....

(1) Site Conditions

05/13/09: PAPER APPROVAL UPDATED INTO AS400. ..

(2) Contracting Conditions

(3) Site and Contracting Conditions

GENERATOR MUST PROVIDE THE FOLLOWING MINIMUM ANALYTICAL AT NEXT RECERT:

\* RCRA METALS, VOCS, TPH. ..

THE WASTE PROFILE SHEET NUMBER MUST BE PRINTED ON THE SHIPPING PAPERS. ..

THE PROFILE SHEET NUMBER MUST BE PRINTED ON THE TOP OF EACH DRUM/CONTAINER SHIPPED. ..

WASTE MANAGEMENT RESERVES THE RIGHT TO REJECT ANY SHIPMENT OF WASTE THAT FAILS TO CONFORM WITH PROFILE SHEET INFORMATION/DOCUMENTATION. ..

CONTACT WASTE MANAGEMENT TO SCHEDULE WASTE FOR DISPOSAL AT LEAST 24 HOURS PRIOR TO SHIPPING. ..

\* SAN JUAN LANDFILL: 505.334.1121. ..

c) Analytical Requirements for Each Load

Per Waste Analysis Plan

d) Decision Expiration Date 01/14/10

IV. Final Decision

State any Additional Precautions, Conditions, or Limitations

Final Approval \_\_\_\_\_

Name (print) STACY ANDERSON

Date 05/13/09



GENERATOR'S WASTE PROFILE SHEET

SJL 09391B

( ) Check here if this is a Recertification LOCATION OF ORIGINAL Industrial Waste Division

A/B WASTE GENERATOR AND CUSTOMER INFORMATION

1. Generator Name: BHP COAL NEW MEXICO Generator USEPA ID: N/A
2. Generator Address: VARIOUS MINE LOCATIONS Billing Address: WASTE MANAGEMENT-FARMINGTON
LA PLATA SAN JUAN NAVAJO ( ) Same 101 SPRUCE STREET
VARIOUS NM 99999
3. Technical Contact/Phone: BRENT MUSSLEWHITE 505/598-2000 FARMINGTON NM 87401
4. Alternate Billing Contact/Phone: Contact/Phone:

C. WASTE STREAM INFORMATION

1a Process Generating Waste: GENERAL MAINTENANCE OF LARGE MINING EQUIPMENT (DIESEL)/MINOR NON REG PETROLEUM RESIDUAL NO FREE L
1b Waste Name: PC ABSORBENTS/HOSES/FILTERS/PLASTIC/SOIL-NM SPECIAL WASTE
1c Color : VARIES
1d Strong Odor: ( ) ;describe:
1e Physical State @ 70F: Solid(X) Liquid( ) Both( ) Gas( ) If Single Layer (X) Multilayer ( )
1g Free liq. range: to % Gravity: to Viscosity: BTU/lb: to
1h pH: Range .0 or Not applicable (X)
1i Liquid Flash Point: < 73F ( ) 73-99F ( ) 100-139F ( ) 140-199F ( ) >= 200F ( ) N.A. (X) Closed Cup (X) Open Cup ( )

2a Is this a USEPA hazardous waste (40 CFR Part 261)? Yes ( ) No (X)
2a Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U): State Waste Codes:

2b Do underlying hazardous constituents (UHCs) apply (40CFR268.48)?(N)
2d Is the waste predominantly debris subject to the Alternate Debris Standards(40 CFR268.45)? (N)
2e Is the waste predominantly soil subject to the Alternate Soil Treatment Standards(40 CFR268.45)? (N)
2f Does the waste contain asbestos? (N) If yes, is waste Friable( ) Non-Friable( ) or Both( )
2g Waste contains benzene in concentrations ppm. NESHAP?(N)
2h Is waste remediation from a major source of Haz Air Pollutants (Site Remediation NESHAP, 40CFR 63 subpart GGGGG)?(N)
If yes, does the waste contain <500 ppmw VOHAPs at the point of determination?( )
2i Waste contains PCBs (< >) X ppm, regulated by 40 CFR 761?(N)
Are PCBs regulated under SIRS Mega Rule (40 CFR 761.61(a))? (N)

2j CHEMICAL COMPOSITION: List ALL constituents (incl. halogenated organics) present in any concentration and forward analysis
Table with columns: Constituents, Range, Unit Description. Rows include INERTS, CARDBOARD, WOOD, PLASTIC BUCKETS, FILTERS, HOSES. TOTAL COMPOSITION (MUST EQUAL OR EXCEED 100%): 110.000000 See attach2

2k Is the waste: Pyrophoric (N) Water-Reactive ( ) Shock Sensitive (N) Oxidizer (N) Carcinogen (N) Infectious (N)
Other
2l Is waste Group 1 wastewater or residual under Hazardous Organic NESHAP?( )
2m Does the waste contain radioactive material? (N) Regulated by NRC?( ) Is radioactive waste NORM?( )
2n Is the waste a CERCLA (40 CFR 300, Appendx B) or state mandated cleanup?(N)
3a This is a Nonwastewater.
3e Physical Appearance: ABSORBENTS, HOSES, PLASTIC, FILTERS, DIRT
3f If waste subject to the land ban & meets treatment standards, check here: ( ) & supply analytical results where applicable.
3g Tracking Number: 5613960

D. DOT Information and Shipping Volume

D1 Anticipated Annual Volume: 150 Units: YARDS Shipping Frequency: MONTH
D2 PACKAGING: Bulk Solid (X) Bulk Liquid ( ) Drum ( ) Type/Size: YARDS Other

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification.

Signature on original profile 09391B DENNIS R VAUGHN ENV SPECIALIST 12/14/07
Signature Name and Title Date

## ATTACHMENT 2

CHEMICAL COMPOSITION: Additional constituents NOT included on page 1 of the Waste Profile  
Constituents Range Unit Description

FLOOR DRY		to 50 %
INERTS		to
ABSORBANT PADS MATS AND SOCKS		0 to 10 %
ARSENIC		to 0.1 MG/L
BARIUM		to 0.55 MG/L
COMMENTS		to
TPH: C13-C28 (DRO) = 620 MG/KG; C6-C12 (GRO) = 120 MG/KG; C29-C40		to
(ORO) = 130000 MG/KG		to
DICHLORODIFLUOROMETHANE		to 18 UG/KG

**Appendix 20.C**

List of Residents within One-Half Mile of the Pinabete Permit Area

**LIST OF RESIDENTS**

This list includes all known residences within one-half mile of the Permit Area.

---

1.	Louise Benally	P.O. Box 772, Fruitland, NM 87416
2	Ida Lopez <sup>1</sup>	P.O. Box 1153, Fruitland, NM, 87416

---

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<sup>1</sup> Residence is approximately 100 feet outside of the one-half mile buffer (i.e., 0.52 miles from permit area).

## **Appendix 20.D**

### Public Blast Notice

*Included in this appendix is a draft of the Public Blast Notice. BHP Navajo Coal Company (BNCC) will update this appendix with a final copy of the Public Blast Notice after publication and distribution as specified in 30 CFR 816.64(b) and Section 20.8.*

PINABETE PERMIT AREA  
PUBLIC BLAST NOTICE

Pursuant to Title 30 of the Code of Federal Regulations Section 816.64 pertaining to blasting, the following Schedule of anticipated blasting for the Pinabete Mine Plan covering the period of [DATE] through [DATE] is published.

The general area of blasting shall be the Pinabete Permit Area located in San Juan County approximately twenty (20) miles southwest of Farmington, New Mexico. The actual area, more specifically defined is: Beginning at a point in Section 9, T26N, R16W, NMPM, San Juan County, New Mexico. Said corner is also known as P-4 of the Navajo Mine Lease Boundary, which has Navajo Mine Coordinates of Northing 2003912.77, Easting 291003.83 and New Mexico State Plane Coordinates, West Zone, NAD 83 of Northing 2003977.72, Easting 2513912.49;

Thence N 48°29'19" E a distance of 403.02 feet to a tentative point called A-2;

Thence N 67°03'44" E a distance of 673.83 feet to a tentative point called A-4;

Thence S 00°00'11" E a distance of 294.28 feet to a tentative point called A-6;

Thence N 66°33'04" E a distance of 2275.61 feet to a tentative point called A-8;

Thence N 90°00'00" E a distance of 8601.57 feet to a tentative point called A-10;

Thence N 74°57'18" E a distance of 8495.58 feet to a tentative point called A-12 on the Navajo Mine Lease Boundary line in Section 6, T26N, R15W, NMPM;

Thence S 00°09'59" E along Navajo Mine Lease Boundary line, a distance of 1803.69 feet to the south 1/4 corner of said Section 6, also called L-122;

Thence S 00°04'50" E a distance of 5279.64 feet to the north 1/4 corner of Section 18, T26N, R15W, NMPM, also called L-124;

Thence S 00°05'09" E a distance of 3960.21 feet to the south 1/16 corner of said Section 18, also called L-126;

Thence S 89°58'43" W a distance of 1320.42 feet to the southwest 1/16 corner of said Section 18, also called L-128;

Thence S 00°03'58" E a distance of 1320.16 feet to the west 1/16 corner of said section 18 and Section 19, T26N, R15W, NMPM, also called L-130;

Thence S 89°57'56" W a distance of 1262.07 feet to the northwest corner of said Section 19, also called L-132;

Thence S 00°00'05" W a distance of 2641.54 feet to the west 1/4 corner of said Section 19;

Thence S 00°00'17" E a distance of 1319.29 feet to the south 1/16 corner of said Section 19 and Section 24, T26N, R16W, NMPM, also called L-134;

Thence N 89°58'58" W a distance of 2639.17 feet to the south 1/16 corner of said Section 24, also called L-136;

Thence S 00°00'27" W a distance of 1319.80 feet to the south 1/4 corner of said Section 24, also called L-138;

Thence S 00°00'58" W a distance of 1319.99 feet to the north 1/16 corner of Section 25, T26N, R16W, also called L-140;

Thence N 89°04'34" W a distance of 4845.76 feet to a tentative point called A-18;

Thence N 29°12'52" W a distance of 3430.69 feet to a tentative point called A-20;

Thence N 10°31'01" W a distance of 836.09 feet to a tentative point called A-22;

Thence S 82°35'08" W a distance of 1896.50 feet to a point called P-8;

Thence N 00°00'00" E a distance of 5200.00 feet to a point called P-7;

Thence N 67°30'00" W a distance of 5000.00 feet to a point called P-6;

Thence N 38°00'00" W a distance of 5000.00 feet to a point called P-5;

Thence N 60°47'01" E a distance of 1875.16 feet to a point called P-4, which is the point of beginning.

During this period blasting may occur at any time between sunrise and sunset on any day of the week.

Access to the general area of blasting is controlled by posted signs, both permanent and temporary, reading "BLASTING AREA" and "DANGER EXPLOSIVES - NO ENTRY".

Access to the immediate area of the blast is controlled by manned roadblocks who deny access to the area by unauthorized personnel. Access is denied prior to the actual explosion and not resumed until the area is clear.

Immediate notice of intent to blast is provided by an audible blast warning. Ten (10) minutes before the blast a long wail siren will be sounded for five (5) seconds. Five (5) minutes before the blast the long wail siren will be sounded continuously until thirty (30) seconds before the blast, when the siren is changed to a yelp. The all clear signal given after the blast area is cleared consists of three (3), five (5) second audible pulses, broken by five (5) second intervals of silence between each pulse.

All blasting conforms to the blasting schedule, except for emergency situations. Emergency situations warranting detonation outside the specified periods include any situation that constitutes a safety hazard to employees, a safety hazard to non-employees, and/or has the potential to damage equipment, mine or otherwise as a result of blasting.

BHP Navajo Coal Company  
Post Office Box 1717  
Fruitland, New Mexico 87416  
Telephone Number: (505) 598-4200