

**SECTION 51**

**RECLAMATION SCHEDULE**

**TABLE OF CONTENTS**

<b>SECTION</b>	<b>SECTION TITLE</b>	<b>PAGE NUMBER</b>
SECTION 51	RECLAMATION SCHEDULE.....	1
51.1	Reclamation Schedule .....	1
51.2	Reclamation Bond Release Phases .....	3
51.2.1	Phase I Bond Release .....	3
51.2.2	Phase II Bond Release .....	3
51.2.3	Phase III Bond Release.....	4
	Personnel .....	4

**SECTION 51**

**RECLAMATION SCHEDULE**

**LIST OF TABLES**

**TABLE**

**NUMBER      TABLE TITLE**

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<a href="#"><u>51.1-1</u></a>	Backfilling and Grading Schedule
<a href="#"><u>51.2-1</u></a>	Pinabete Phase I Bond Release Areas
<a href="#"><u>51.2-2</u></a>	Pinabete Phase II Bond Release Areas
<a href="#"><u>51.2-3</u></a>	Pinabete Phase III Bond Release Areas

**SECTION 51**

**RECLAMATION SCHEDULE**

**LIST OF EXHIBITS**

<b>EXHIBIT NUMBER</b>	<b>EXHIBIT TITLE</b>
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<a href="#">51.2-1</a>	Bond Release Areas
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**SECTION 51**

**RECLAMATION SCHEDULE**

**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 51 RECLAMATION SCHEDULE**

BHP Navajo Coal Company (BNCC) is committed to the successful reclamation of all areas disturbed during mining and related activities in the Pinabete permit area (permit area). Reclamation operations, including backfilling, grading, topdressing redistribution, and revegetation practices, are described in detail in the reclamation plan (Part 5) of this permit application package. This section references information contained in the permit term disturbance exhibits (Exhibit 20.1-1), the anticipated reclamation blocks (Exhibit 34.2-2), and the final surface configuration (FSC) (Exhibit 34.1-1) to address reclamation sequencing. The anticipated disturbance and reclamation dates for topdressing stockpiles, roads, and impoundments are provided in Section 22 (Support Facilities), Section 23 (Roads), and Section 26 (Drainage Control Plan), respectively.

### **51.1 Reclamation Schedule**

BNCC has prepared a detailed permit term and projected life-of-mine disturbance exhibit for the permit area (Exhibit 20.1-1). Those exhibits allow the reader to visualize the sequence and timing of mining disturbances for the life of the mine. In Section 34 (Post-Reclamation Topography), BNCC evaluated the FSC (Exhibits 34.1-1) and a modeled post-mining topography to develop reclamation blocks for the disturbance area. The reclamation blocks will be used to develop a reclamation sequence for the FSC which achieves mass balance while maximizing contemporaneous regrade between the pit ramps. The combination of the mine disturbance and reclamation block exhibits provides a general reclamation sequence that will allow BNCC to reclaim the permit area as contemporaneously as practicable.

BNCC has designed the FSC to utilize the fluvial geomorphic reclamation approach (Section 34 Post-Reclamation Topography). However, BNCC acknowledges that circumstances may dictate implementation of traditional reclamation approaches that include designing surface drainages and hill slopes that are dependent on riprap, gradient terraces, or other “hard engineering” approaches to stabilize drainages and control erosion. It is BNCC’s goal to keep the use of these traditional reclamation techniques to a minimum. Further discussion on fluvial geomorphic and traditional reclamation approaches is discussed in Section 38 (Post-reclamation Surface Stabilization and Sediment Control).

The fluvial geomorphic reclamation approach uses site-specific fluvial geomorphic data in order to develop a FSC that generally mimics the natural landscape. This reclamation approach will create an erosionally stable surface by creating land forms that resemble those found in the natural or pre-mining environment. The post-mining reclamation surface will tie into specific drainage profiles and elevations to ensure correct hydrologic balance within the disturbed areas, as well as tying into undisturbed drainages upstream and downstream. The efforts required to establish the appropriate drainage profiles are controlled by the Cottonwood Arroyo and Pinabete Arroyo channels. In the Cottonwood Arroyo watershed, reclamation will start in the lowlands of the drainage basin and progress to the upstream. While in the Pinabete Arroyo

watershed, reclamation will start in the uplands of the drainage basins and progress downstream to the undisturbed channel profile. The reconstructed upper drainages of the Pinabete Arroyo may cross the pit ramps, which are required to remain open until the final closure of the Area 4 North and Area 4 South mining pits.

During the first permit term, years 1 through 5 (fiscal years [July to June] 2016 – 2020), BNCC will continue the southward strip advancement in Area 4 North. In the second permit term, years 5 through 10 (fiscal years 2021-2026), BNCC will construct the support facilities and structures necessary to initiate mining in the Area 4 South mining area. As construction of these features nears completion, the production focus will shift to creating the Area 4 South mining pit boxcuts and the first mining strip lines. Excess cut material from the Area 4 North and Area 4 South boxcuts may be utilized for minefill or stockpiled in advance of the mining strips for future reclamation needs. Reclamation activities occurring within the first two permit terms will be limited to primary regrading. Any final reclamation during the first two permit terms will largely be limited to incidental disturbances associated with temporary or support facility construction. BNCC will initiate primary regrading once logical, operationally feasible blocks become available. The projected regrading schedule is provided in [Table 51.1-1](#). See Section 20 (Mining Operations) and Section 34 (Post-Reclamation Topography) for additional information on the anticipated permit term disturbances and reclamation blocks, respectively.

An area will be operationally feasible for reclamation if it is a sufficient distance away from the active mining areas and of sufficient size to allow for the safe operation of reclamation equipment. This practice minimizes the risk of interaction between mining and reclamation operations and maximizes the safety of BNCC's workforce. Additionally, mining activities must have ceased in the proposed reclamation area. Reclaimed areas may need to be redisturbed to facilitate the safe operation of mining and reclamation activities. These areas will be reclaimed once again after the disturbance is no longer needed.

It is BNCC's intent to reclaim all areas disturbed by mining activities as contemporaneously as practicable. The timing of reclamation can be affected by the following factors:

1. Ramp backfill to maintain haulage ramps. As the pit progresses, ramps used for coal mining are backfilled. The material balance for FSC elevation is located adjacent to the ramps. The entire ramp cannot be backfilled to its final FSC elevation due to the operational need to maintain a ramp of a set grade down to the bottom coal seam for coal haulage. The source for this ramp backfill material typically comes from the ungraded spoil material surrounding the ramps. As a result, areas around ramps are regraded less contemporaneously as compared to other regrade areas.
2. Final pit backfill. A buffer of ungraded spoil approximately 4,500 feet in width, measured from the centerline of the final pit, is required to provide enough material to backfill the final pit to the FSC elevation.

3. Drainage channel construction. The reestablishment of post-mining drainages to the approved design requires that some areas not be regraded contemporaneously. Post-mining drainages will be reestablished once the post-mining watershed area meets the grades and elevations described in the FSC.
4. Maximizing coal recovery. In some areas, the land must not be regraded contemporaneously to facilitate future coal recovery in adjacent areas.
5. Boxcut spoils are often left ungraded until near the end of the mine life, as they represent a source of backfill material that may be required to complete reclamation to the final surface design.
6. Long-term facilities, such as haul roads, access roads, support facilities, and sediment and drainage control features, would be reclaimed during the final reclamation phase

### **51.2 Reclamation Bond Release Phases**

BNCC will apply for phased bond release in logical blocks that are not expected to be affected by future mining and reclamation disturbance. The logical blocks will be of sufficient size to allow for an adequate representation of the reclaimed area. BNCC has found pursuing phase bond release in these logical blocks, rather than a small-area segregated approach, to be practical from an operational perspective. Reclamation areas for which BNCC has received phase bond release approvals are presented on [Exhibit 51.2-1](#). The Office of Surface Mining Reclamation and Enforcement will review and approve all phase bond release applications.

#### *51.2.1 Phase I Bond Release*

Areas within the permit area which have been backfilled and graded will be eligible for Phase I bond release. These areas may include lands on which topdressing has been redistributed. Areas for which BNCC has received Phase I bond release approvals are described in [Table 51.2-1](#) and presented on [Exhibit 51.2-1](#).

#### *51.2.2 Phase II Bond Release*

Areas within the permit area which have successfully been revegetated will be eligible for Phase II bond release. Reclaimed areas that contribute suspended solids to streamflow, or runoff to streams and drainages outside of the permit area, equal to or less than the applicable standards will be eligible for Phase II bond release. BNCC may elect to apply for Phase II bond release concurrently with Phase III bond release applications. Areas for which BNCC has received Phase II bond release approvals are described in [Table 51.2-2](#) and presented on [Exhibit 51.2-1](#).

*51.2.3 Phase III Bond Release*

Areas within the permit area where BNCC has successfully completed mining and reclamation activities and achieved the revegetation success criteria (Section 37 Post-Reclamation Vegetation) will be eligible for Phase III bond release. The revegetation success criteria must be achieved in at least two of the last four years of the 10-year responsibility period. Areas for which BNCC has received approval for Phase III bond release are described in [Table 51.2-3](#) and presented on [Exhibit 51.2-1](#).

*Personnel*

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

Kent Applegate  
Ron Van Valkenburg  
Matt Owens  
BHP Navajo Coal Company



*Pinabete Permit Application Package*

Table 51.1-1 Backfilling and Grading Schedule

Fiscal Year (July- June)	Reclamation Blocks <sup>1</sup>	Acreage
2016	-	-
	Sub-Subtotal	-
2017	-	-
	Sub-Subtotal	-
2018	-	-
	Sub-Subtotal	-
2019	-	-
	Sub-Subtotal	-
2020	D1, D2, D3	28.0
	Sub-Subtotal	28.0
	5-yr Subtotal	28
2021 - 2026	D1, D2, D3, D4, D5, D6, D7	226.8
	5-yr Subtotal	226.8
2027 - 2031	D8, D9, D10, D11, D12, D13, D14, T4, T5	208.4
	5-yr Subtotal	208.4
2032 - 2036	D15, D16, D17, D18, D19, D20, D21, D22, D23, D24, D25, D26	322.6
	5-yr Subtotal	322.6
2037 - 2041	D21, D22, D23, D24, D25, D26, D27, D28, D29, D30, D31, D32, D33, T6, T7,	434.8
	5-yr Subtotal	434.8
2042 - 2046	D31, D32, D33, D34, D35, D36, D37, D38	439.4
	5-yr Subtotal	439.4
2047 - 2051	D39-D120, T8-T16	2,361.7
	5-yr Subtotal	2,361.7
	Total	4,021.7

<sup>1</sup> See Exhibit 34.2-2 for Reclamation Blocks

Table 51.2-1 Pinabete Phase I Bond Release Areas

Phase I area ID	Area (ac)	Date of Phase I bond release	Date of initial disturbance	Date of completion of mining activities

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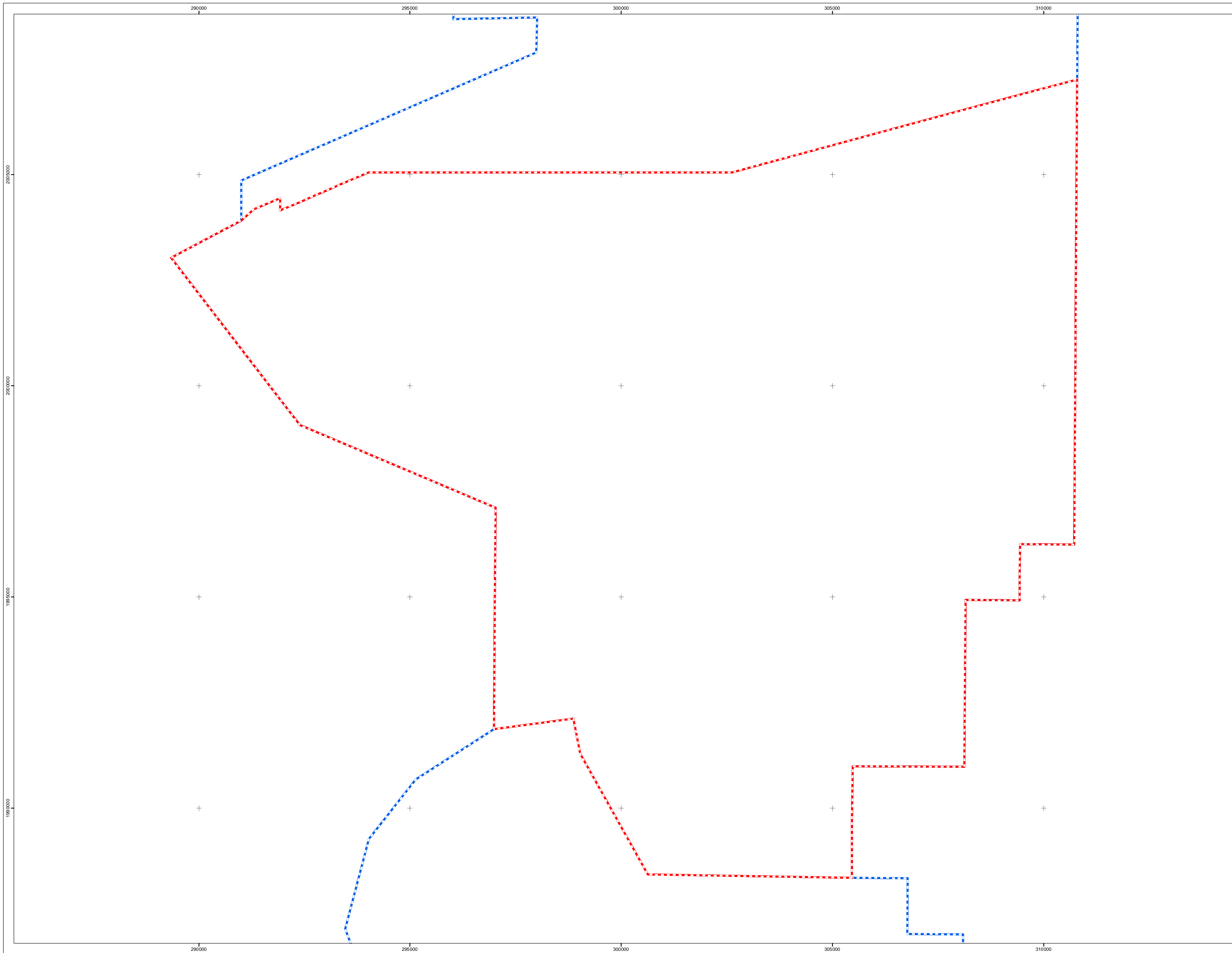
Table 51.2-2 Pinabete Phase II Bond Release Areas






Phase II area ID	Area (ac)	Date of Phase II bond release	Date of initial Phase I bond release in area	Date of last Phase I bond release in area

Table 51.2-3 Pinabete Phase III Bond Release Areas

Phase III area ID	Area (ac)	Date of Phase III bond release	Date of initial Phase II bond release in area	Date of last Phase II bond release in area

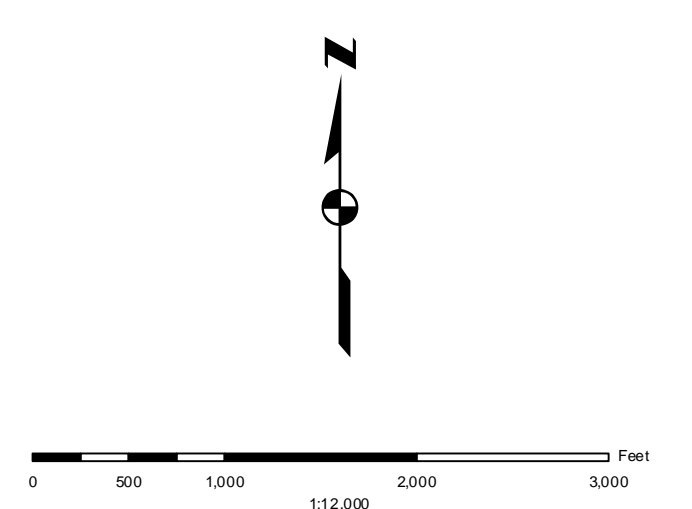
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- Legend**
-  Pinabete SMCRA Permit Area
  -  Mining Lease Area
  -  Phase I Bond Release
  -  Phase II Bond Release
  -  Phase III Bond Release

**Notes:**  
 This exhibit will be updated as areas become eligible and approved for bond release.

Coordinate System:  
 NAD 1927 State Plane New Mexico West FIPS 3003  
 Projection: Transverse Mercator  
 Datum: North American 1927  
 Units: Foot US



REV. NO.	DATE	BY	REVISION DESCRIPTION	CHKD.	APP'D.
01	2/29/2012	MPO	Prepared for submittal to OSM	CKA	

**bhpbilliton**  
 resourcing the future

**BHP NAVAJO COAL COMPANY**  
 Bond Release Areas

PREPARED BY: MPO	DRAWN BY: MPO	PAPER SIZE: ARCH D
APPROVED BY: CKA	DATE: 2/29/2012	