

SECTION 40

ENVIRONMENTAL PROTECTION

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LIST OF REVISIONS DURING PERMIT TERM

REV. NUMBER	REVISION DESCRIPTION	DATE APPROVED
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SECTION 40 ENVIRONMENTAL PROTECTION

This permit application package (PAP) section describes the consideration that was given to making the proposed surface mining and reclamation activities consistent with surface owner plans and applicable federal, tribal, state, and local land use policies, plans and programs and the measures to be used to maximize the use and conservation of the coal resource. Protection plans for perennial and intermittent streams, public parks and historic places, public roads, utility installations, fish and wildlife resources, and alluvial valley floors (AVF) are described below. This section also describes the measures to be taken to control and prevent air pollution attendant to erosion, and the measures to be taken to temporarily seal exploration holes, boreholes, wells, and other underground openings.

40.1 Conformance of Surface Mining Activities with Land Use Plans, Policies, and Programs

The post-mining land use (PMLU) for the Pinabete Mine Plan permit area (permit area) is grazing and wildlife habitat. These land uses are consistent with the pre-mine lands uses described in Section 10 (Land Use) and conform to the policies and plans of the Navajo Nation, Bureau of Indian Affairs (BIA), and the local Navajo Nation chapters. Further discussion on how the PMLU conform to the land use plans, policies, and programs is presented in Section 30 (Post-Reclamation Land Use).

40.2 Coal Recovery and Conservation

Surface mining operations will be conducted in a manner that maximizes the utilization and conservation of the coal resource, using the best appropriate technology currently available to maintain environmental integrity and minimize the potential for future surface mining operations to re-affect the land, in compliance with 30 CFR 816.59. [Navajo Transitional Energy Company \(NTECBNCC\)](#) will conduct surface mining operations in a manner that develops the coal resource within the permit area in compliance with commitments to the Navajo Nation contained in the [BNCCNTEC](#) coal lease agreement, described in Section 6 (Land Ownership and Control). [BNCCNTEC](#) will prepare and provide to the U.S. Department of the Interior - Bureau of Land Management a Resource Recovery and Protection Plan (R2P2) covering all surface mining and reclamation activities in compliance with 43 CFR 3482.1(b). Augering technology or *in-situ* processing activities will not be employed to maximize coal recovery and conservation, as described in Section 20 (Mining Operations).

[BNCCNTEC](#) maximizes coal recovery in the permit area by optimizing blasting, stripping, coal extraction, training, planning, and reclamation activities. These topics are presented in greater detail in Part 3 (Operations Plan) and Part 5 (Reclamation Plan) of this PAP. Overburden blast holes are managed in a way to minimize potential fracturing of the coal by overburden blasting and subsequent loss of loose coal during stripping. Coal blast holes are managed in a way to optimize fragmentation and reduce scatter. [BNCCNTEC](#)'s equipment operators minimize gouging the coal seam with equipment buckets or blades during stripping. Special care is taken not to strip into the coal seam when stripping near a known fault.

Loose coal is generally either pushed onto previously shot coal or wind-rowed to be recovered with mining. Coal wedges are used to reduce spoil encroachment. Recovery of both coal wedges and fenders is maximized to the extent safely possible. **BNCCNTEC** implements a comprehensive training program for all equipment operators with resource recovery as an integral part of the program. It is during this training where the aforementioned techniques are first presented. This training aids in achieving the goal of maximum economic recovery. Follow-up reviews are continually performed to monitor operator proficiency and to identify further training needs. Planning also plays a major role in maximum economic recovery by attempting to identify all coal that is recoverable and then scheduling it into the production sequence. This planning includes consideration of marginal coal seams (i.e., thin, out-crop, or low-quality seams) and pit match-ups, as well as pit orientation and geometry (width and length). **BNCCNTEC** plans to reclaim to an approximate original contour that maximizes the backfilling of boxcut materials and leaves no excess spoil piles or highwall spoil piles. Detailed reclamation plans are provided in Part 5 (Reclamation Plan) of this PAP.

Although operations are engineered and planned to recover the maximum amount of coal, a small percent of coal is lost as boxcuts, coal wedges, coal ribs, and at the top and bottom of coal seams. Boxcut placement is dependent on such factors as coal extent (crop), coal quality, spatial relationship to the lease boundary, depth of the coal seams, quantity of spoil material rehandle, stockpiles, haulage ramp configuration, and haul ramp alignment. Coal recovery in the boxcuts is in the 80% to 95% range, with the variability due to the difficult stripping and mining conditions inherent to boxcut operations. Boxcutting represents only a small percentage of the total stripping in the permit area. 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. 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.

40.3 Signs and Markers

Signs identifying **BNCCNTEC** and **BNCCNTEC**'s mailing address, phone number, the current Office of Surface Mining Reclamation and Enforcement (OSM) permit identification number, and blast warning signs will be posted at all points of public road access into the permit area. The signs shall be made of durable materials and maintained until the release of all bonded lands. Further discussion of information contained on the blast warning signs is provided in Section 20 (Mining Operations).

Soil stockpiles will be clearly marked to identify the type of material (e.g. topdressing or regolith) and the name of the stockpile. For more information on soil stockpiles see Section 22.9 and Section 36.3.1. Stream buffer zones will be marked along the perimeter of the buffer zone areas. All signs will be made of

durable materials, routinely checked, and maintained for the duration of the activity or facility to which they pertain.

Permit markers will be established around the perimeter of the permit area prior to commencing coal mining and reclamation activities. These markers will be maintained until the release of all bonded lands.

40.4 Stream Buffer Zone Protection

The intermittent streams identified within the permit area are Pinabete Arroyo and Cottonwood Arroyo, as described in Section 18 (Water Resources) of this PAP. The identified stream buffer zone area can be found in Exhibit 22.1-1.

In accordance with 30 CFR 816.57(b)(2), [BNCNTEC](#) may utilize the exceptions described by the stream buffer zone area regulations to construct crossings to facilitate roads, railroads, conveyors, pipelines, utilities, or similar facilities across Cottonwood Arroyo.

The stream buffer zone will be marked with signs posted at distances measured 100 feet horizontally from the centerline of the arroyos. Signs will be placed along the length of the stream buffer zone for an appropriate distance to adequately delineate its extent.

40.5 Protection of Public Parks and Historic Places

There are no publicly owned parks within or adjacent to the permit area, therefore, there are no publicly owned parks that could be expected to be adversely affected by the surface coal mining operations. Surveys, testing, and mitigation of cultural resources and historic properties, presented in Section 11 (Cultural, Historic, and Archeological Resources), were completed for the permit area. Based on cultural resource work, 32 sites are recommended as eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP) within the permit area. The plans for preventing and minimizing adverse impacts and the mitigation and treatment measures to be taken to protect the historic places will be developed in accordance with the upcoming Pinabete Permit Programmatic Agreement and in consultation with OSM, the Navajo Nation, and other parties participating in the Section 106 consultation (Section 11, Cultural, Historic, and Archeological Resources).

40.6 Public Roads Protection Plan

[BNCNTEC](#) proposes to realign ~~the a 2.8-mile~~ segment of the Burnham Road (BIA 3005 and Navajo Road N5082) through Area 4 South to accomplish maximum recovery of the coal resource. The ~~realigned segment will extend 2.7 miles alignment of the new road will be~~ within the [BNCNTEC](#) lease area along the eastern boundary and ~~will reconnected~~ to the existing [Burnham R](#)oad. The realignment will enhance the safety of the public using the road by relocating the road away from mining activities. [Burnham Road](#),

including the realigned portion, will remain as a permanent post-mine feature and continue to function as a public road under BIA's jurisdiction. BNCNTEC will follow the procedures described in 30 CFR 761.14 and obtain all the necessary approvals for construction of the road realignment. BNCNTEC will submit a ROW application for temporary road construction of the Burnham Road segment to BIA as planned mining activities approach the realignment area in approximately 2022. Once the construction is complete, the construction ROW will no longer be required and it will be terminated. OSM is evaluating the effects of the Burnham Road realignment 7 in the Four Corners Power Plant and Navajo Mine Environmental Impact Statement.

Preliminary construction plans have been developed by Geomat, Inc. of Farmington, New Mexico for the relocation of the existing Burnham Road. The preliminary road alignment travels northward through Area 4 South and into Area 4 North, where it connects with the previous relocation of the Burnham Road (OSM Project No. NM-0003-F-I-40). The preliminary construction plans are comprised of 11 sheets containing detailed plan and profile designs ([Exhibit 40.6-1](#), sheets 1 through 11). The proposed relocated road is 2.7 miles in length. The road geometrics were designed in general accordance with guidelines in *A Policy on Geometric Design of Highway and Streets* (commonly referred to as the Green Book) (American Association of State Highway and Transportation Officials 1990). The geometric design data are presented in [Table 40.6-1](#).

The road is comprised of two 12-foot lanes with 6-foot shoulders. The cut and fill slopes are 4 horizontal to 1 vertical (4h:1v) except at culvert locations with guardrail where the fill slopes behind the guardrail are 2h:1v to minimize the required amount of fill.

The road alignment intersects six drainages along its length. These drainage crossings are all comprised of crossings with corrugated metal pipes. The hydrology for the drainage basins was evaluated in accordance with the BIA's Navajo Area Roads Drainage Design Guide (1998), utilizing SEDCAD™ software. The Federal Highway Administration's (FHWA) HY-8, Version 7.1 software was used to determine the size of culverts ([Appendix 40.A](#)). Either rock-filled gabion baskets or riprap are used for outflow protection at each crossing.

40.7 Utility Installation Disturbance Plan

There are no known oil or gas wells present within the permit area. There is one powerline within the permit boundary supplying residential electricity from Navajo Transmission Utility Authority. The location of the powerline is presented on Exhibit 10.1-2. **BNCNTEC** will work with utility companies and residences and develop plans to consider any potential utility disturbance. Further information on pre-mine utilities is presented in Section 10 (Land Use). Various groundwater supply wells, used for stock watering, are present within the permit area. The location and description of these wells are presented in Section 18

(Water Resources). As mining progresses through the permit area, these wells will eventually be removed based on the long-term mine sequence provided in Section 20 (Mining Operations). The replacement of pre-mine water use is discussed in Section 41 (Probable Hydrologic Consequences) and Section 35 (Hydrologic Reclamation Plan).

Based on the discussion in Section 10 (Land Use) and Section 18 (Water Resources), there are no other additional utilities within the permit area.

40.8 Fugitive Dust Control Plan

BNCCNTEC employs a number of practices to control or minimize fugitive dust emissions from mining activities. These practices include both direct and indirect control measures. A direct control of one activity, such as haul road watering, may result in an indirect control of adjacent areas. The direct and indirect fugitive dust control practices for road use, coal handling, and mining activities for the permit area are described in [Table 40.8-1](#).

40.9 Temporary Sealing of Bore Holes, Wells, and Other Underground Openings

BNCCNTEC will take measures to backfill and seal exploration holes, boreholes, wells, and abandoned underground openings to protect public health and safety and the environment as described in Section 22 (Support Facilities) and Section 32 (Temporary Structures and Facilities Removal and Reclamation).

40.10 Fish and Wildlife Protection Plan

BNCCNTEC will implement various procedures to minimize or prevent impacts to wildlife during the operation of the Pinabete Mine Plan. These procedures include but are not limited to: 1) limiting the amount of vegetation and topography disturbed to only that necessary to conduct mining; 2) designing facilities, such as transmission lines, to prevent mortality of raptors; and 3) monitoring important wildlife habitat (such as rimrocks, raptor nests, and water sources) and species so appropriate plans to avoid significant undesirable impacts can be developed and implemented. Baseline wildlife species and habitats are presented in Section 16 (Fish and Wildlife). The wildlife species monitoring and mitigation plans are presented in Section 42 (Monitoring, Maintenance, Inspections, and Examinations).

Disturbance to the native vegetation, topography, and important wildlife habitats will be minimized to only those areas necessary to safely conduct mining activities. Buffer zones, which restrict mining and reclamation activities, will be established around active (occupied) raptor nests located on and adjacent to the permit area. These buffer zones will be established through consultation with the Navajo Nation Department of Fish and Wildlife (NNDFW) and/or the U.S. Fish and Wildlife Service (USFWS) on a site- and species-specific basis, as necessary. Mining and reclamation activities will be restricted from commencing within active nest buffer zones to prevent nest abandonment.

Location of important wildlife habitats will be considered when planning the placement of haul roads and ancillary support facilities so they can be avoided as much as practicable. To protect raptors from direct mortality due to electrocution, ~~the design and construction of~~ electric power lines and other transmission facilities on the permit area will be designed and constructed with raptor-safe power pole design per Raptor Electrocution Prevention Regulations (REPR) (NND&W 2008). All guy wires will be marked with highly visual daytime markers to prevent bird collisions within the Pinabete permit area. meet the guidelines set forth by the Avian Power Line Interaction Committee (2006). Poles, frequently used by raptors, may be left in place or reestablished during reclamation to allow continued use of these sites (or other sites used frequently during the life of the mine).

In addition to limiting the disturbance areas and consideration during facility location and design, BNCCNTEC will monitor wildlife species and important wildlife habitats to protect them against adverse impacts relative to the mining operations. If raptors, sensitive species, or their habitats are affected by mining activity, BNCCNTEC will consult with NNDFW and/or the USFWS to develop plans to limit impacts. Such plans will be developed on a case-by-case basis. Any work involving the handling of raptors or sensitive species will require special permits and be closely coordinated with the NNDFW and USFWS. Further discussion on BNCCNTEC's monitoring and mitigation plans for raptors, sensitive species, and general wildlife is found in Section 42.54.

BNCCNTEC will comply with all applicable wildlife protection policies, guidelines, and regulations. Examples of these policies, guidelines, and regulations include but are not limited to: SMCRA, Endangered Species Act (ESA), NNDFW's Ferruginous Hawk Nest Protection Policy, Bald and Golden Eagle Protection Act, and New Mexico Department of Game and Fish's Guidelines and Recommendations for Burrowing Owl Surveys and Mitigation.

Section 16 (Fish and Wildlife) indicates that there are no permanent water bodies capable of supporting year-round fish populations within the permit area. Measures to protect hydrologic features are presented in Section 8 (Compliance with Air and Water Quality Laws and Regulations) and Section 41 (Probable Hydrologic Consequences). BNCCNTEC will comply with all applicable Navajo Nation Environmental Protection Agency (NNEPA), U.S. Environmental Protection Agency (USEPA), and U.S. Army Corps of Engineers (USACE) regulatory requirements for compliance with applicable provisions of the Clean Water Act. Copies of the applicable Clean Water Act permits are available for review at the mine site.

40.11 Protection of Alluvial Valley Floors

There are no alluvial valley floors (AVF) present within or adjacent to the permit area. Therefore, this section is not applicable. Discussion on AVF and OSM's negative determination for AVF is provided in Section 19 (Alluvial Valley Floors).

40.11.1 Farming Activities on Alluvial Valley Floors

There is no farming, prime farmland or AVF present within or adjacent to the permit area. Consequently, there will be no interruption, discontinuance, or preclusion of farming on AVF within or adjacent to the permit area. Therefore, this section is not applicable.

40.11.2 Material Damage to Waters Supplying Alluvial Valley Floors

There are no AVF present within or adjacent to the permit area. Consequently, there will be no material damage to the quantity or quality of surface or groundwater supplied to AVF within or adjacent to the permit area. Therefore, this section is not applicable.

40.11.3 Alluvial Valley Floor Protection Plan

There are no AVF present within or adjacent to the permit area. Consequently, the surface coal mining and reclamation operations will not affect the essential hydrologic function of any AVF adjacent to or outside of the permit area. Therefore, this section is not applicable.

40.12 Paleontological Resource Management Plan

The Pinabete Permit area lies within an area of complex geologic history which has resulted in the deposition of a rich paleontological record. Past paleontological inventories, discussion of significant paleontological resources, and their mitigation are presented in Section 17 (Geology). To help with the management of known and undiscovered paleontological resources, NTEC has developed the Paleontological Resource Management Plan (PRMP) as a multi-stage process to assess the significance of paleontological resources and describe a hierarchy of mitigation strategies (Appendix 17.F). The PRMP provides efficient and practical guidelines that are consistent with Navajo Nation, U.S. Department of Interior - Bureau of Indian Affairs (BIA), and OSM regulations and policies and U.S. Department of Interior - Bureau of Land Management (BLM) guidelines for paleontological work on Federal lands (BLM 1998). The following sections summarize the paleontological resources significance criteria and mitigation strategies found in the PRMP.

Section 42 (Monitoring, Maintenance, Inspections, and Examinations) describes the process NTEC will use to monitor the pre-mining vegetation and topdressing removal areas for the presence of paleontological resources.

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40.12.1 Paleontological Significance Criteria

Once a paleontological resource, or locality, is identified, the significance of the resource must be considered. The significance of the resource is evaluated against a set of criteria that is consistent with those outlined by the BLM (BLM 2009). NTEC has refined these criteria to clarify the decision-making process during field assessments.

All paleontological resources are classified as:

- Significant: the resource has potential to contribute new or important data to science,
- Non-significant: recordation has exhausted the data potential of the resource, or
- Need data: surface indications are inadequate to assess significance and limited excavations may be required.

A significant paleontological resource includes one or more of the following characteristics:

- It is of a rare or previously unknown species that can provide new information relevant to the history of life on earth;
- It is well preserved and has a high degree of physical integrity that has value for scientific study, display, and/or education;
- It preserves previously undocumented anatomical characteristics or features of a species, even if that species has been extensively documented;
- It is in appropriate geologic context that provides new information on paleo-environment from the surrounding sediments, and/or provides new information regarding stratigraphic association, and/or provides new information on plant/animal associations; or
- It is of rare occurrence in the region, even though it may be well documented elsewhere.

Rare or unknown species in the fossil record are clearly significant to scientific research, as they provide new information relevant to the history of life on earth. The degree of preservation and physical integrity of fossil remains is crucial since what can be learned about a fossil has much to do with how much of that specimen is intact. Well-preserved fossils need not be complete, but significance of known and well-documented species is assessed with regard to whether the specimen preserves previously undocumented anatomical characteristics. Complete fossils, particularly crania, are always rare in paleontology and have significance for this reason. Similarly, articulated fossil material is also rare and has value for anatomical research, even for known species. Fossil teeth from mammals are very diagnostic and many fossil mammals are only known from their teeth. Fish, amphibian, and reptile teeth are generally considered less important and without good stratigraphic context or association with other fossil elements, they are typically not considered significant.

Because fossils are rarely found in the place that they existed as living organisms, instances where plant and animal fossil organisms are preserved together with the environment in which they lived are valuable windows into the past. Such occurrences may be instances of fossil forests, where tree stumps are preserved in place with ancient soils and/or animal remains. These occurrences are significant because of rarity, but also because they can provide data on stratigraphic (i.e. chronological) association of plants, animals, and geological formations.

A non-significant paleontological resource designation is assigned if a resource lacks one or more of the characteristics listed above for significant resources. Non-significant paleontological resources may include the following:

- Fossils that are too fragmentary to be confidently identified beyond genus;
- Identifiable fossil fragments with poor preservation due to decay or erosion;
- Identifiable fossil fragments with poor context (e.g., washed out in gravels);
- Poorly preserved fossils where in-field documentation and/or collection of samples have exhausted the research potential of the occurrence. Documentation must be detailed enough to convey all details of the occurrence; and
- Common or well-documented fossils found in known stratigraphic contexts where in-field documentation and/or collection of a sample has exhausted the research potential of the occurrence.

If the significance of a paleontological resource cannot be adequately assessed by surface indications, the resource may be classified as ‘Needs Data’. This classification may require additional field visits and/or investigation through limited test excavations to adequately expose and assess the resource. This can often be done during the inventory, but may require additional consultation to proceed. It is extremely important that the significance of these resources be adequately assessed to enable the design of a data recovery plan to mitigate direct effects.

The assessment of a paleontological resource as ‘Significant’ or ‘Non-significant’ will be based on the professional opinion of a paleontologist and the significance criteria outlined in the PRMP (Appendix 17.F). The Navajo Nation Minerals Department, with OSM oversight, will review the paleontologist’s determination of the paleontological resource.

40.12.2 Mitigation of Direct Impacts

Direct effects to paleontological resources are defined as impacts that alter the physical integrity of the stratigraphic context and/or individual fossils. This may happen by removal of the fossil-bearing strata, or changes in the landscape that may change erosion patterns that accelerate the exposure and deterioration of the fossils.

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Consideration of direct effects applies only to paleontological resources assessed as significant by a professional paleontologist and determined significant. This determination can only be made once the paleontological resources classified as 'Need Data' have been assessed as 'Significant' or 'Non-significant'. Non-significant paleontological resources require no further investigations beyond the data collected during the field inventory as they have limited potential to contribute new or important data to science beyond that which has been documented by the inventory.

The direct effects to significant paleontological resources from the Pinabete mine plan can be mitigated following a hierarchy of options: avoidance, data recovery, and alternative mitigation. The mitigation of adverse effects may require a combination of all three of these approaches.

1. Avoidance. The significant paleontological resource or locality can be preserved in place and avoided by all mining activity.
2. Data Recovery. The significant paleontological resource may be excavated and removed to a curation facility to be preserved for future study. Alternatively, fossil deposits can be further documented without removal of every fossil. This would include detailed mapping and study of the deposits in the field. In paleontological localities where fossils may be widely scattered, a sample of the resource may be collected and removed from the area of proposed disturbance.

The data recovery approach to mitigate the direct effects of mining on significant paleontological resources is consistent with the Federal guidelines in that the intent of the regulations is to preserve remains that are considered to be of scientific interest. A data recovery plan can be formulated prior to mitigation fieldwork that includes the following:

- Prepare an overview of previous paleontological research in the area;
 - Summarize significant paleontological resources identified in the permit area;
 - Identify specific research domains related to the significant paleontological resources and justify needs for further work;
 - Specify a detailed recovery plan for each significant paleontological resource; and
 - Prepare a curation plan for all paleontological materials that may be removed;
3. Alternative Mitigation. Alternative mitigation strategies may be employed including identifying other fossil localities outside of the project area which are subject to data recovery instead of the fossils and localities within the project area. Alternative mitigation options will be discussed with the Navajo Nation Minerals Department prior to implementing this mitigation approach.

40.13 Certification of Designs and Exhibits

All certified exhibits for this permit application package section are available for review upon request at the BNCENTEC offices or the 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:

<u>Kent Applegate</u>	<u>BHP Billiton Mine Management</u>
<u>Ron Van Valkenburg</u>	<u>Company (disclosed agent)</u>
<u>Vivie Melendez</u>	<u>Farmington, NM</u>
<u>Matt Owens</u>	
<u>BHP Navajo Coal/Navajo Transitional</u>	GEOMAT, Inc.
<u>Energy Company</u>	Farmington, NM
	<u>PaleoWest Archeology,</u>
	<u>Farmington, NM</u>

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