

BHP Navajo Coal Company



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Mr. Mychal Yellowman
Navajo Mine Coordinator
Office of Surface Mining/Western Regional Coordinating Center
1999 Broadway, Suite 3320
Denver, Colorado 80202

12-01-31-15

Re: Navajo Mine Permit Number NM-0003F; Proposed Chinde Groundwater Monitoring Enhancements

Dear Mr. Yellowman,

BHP Navajo Coal Company (BNCC) is submitting for your review and approval, Proposed Chinde Groundwater Monitoring Enhancements.

The objective of the groundwater monitoring program is to monitor quality and quantity as it relates to the suitability of the groundwater for the current and approved post mining uses and the protection of the hydrologic balance. The program was developed to address the hydrogeologic monitoring requirements for surface coal mining and reclamation activities on Indian Lands. The purpose of the monitoring plan is to 1) generate hydrogeologic data of sufficient quality and quantity to support the objectives of the groundwater monitoring program and 2) to document the objectives, rationale, and procedures used for the collection of groundwater information.

The Office of Surface Mining Reclamation and Enforcement (OSMRE) is currently reviewing BNCC's proposal to develop approximately 800 acres in Area IV North. As a part of the associated technical review process, BNCC has agreed to supplement the existing hydrologic monitoring program by 1) reinstating, where possible, historic ground water monitoring wells in Area I and Area III, 2) installing new wells in Area II, Area III, and Area IVN, and 3) installing additional surface water monitoring stations in Area II and Area III. A meeting between OSMRE and BNCC is scheduled for February 28, 2012 to finalize locations, construction requirements, and any other outstanding details related to the supplemental monitoring. In preparing for the February 28, 2012 meeting, BNCC identified opportunities to enhance the existing monitoring program and the proposed supplemental monitoring program through additional monitoring and hydrogeologic characterization of the Chinde watershed. Consequently, BNCC is proposing to update the existing monitoring and proposed supplemental monitoring programs as described below.

Chinde Area Overview

Mining activities started in the Chinde area with the construction of the Chinde Diversion Channel in 1971, which was built to divert surface water from the Chinde Arroyo around mining activities in Yazzie Pit. In 1973 BNCC built the "Big Fill", which was built for the rail crossing of the Chinde Arroyo. The Chinde Area has also experienced impacts from sources other than mining. In 1979, the Navajo Indian Irrigation Project (NIIP) and Navajo Agricultural Products Industry (NAPI) initiated commercial scale irrigation on lands adjacent to the BNCC mining lease, and this has resulted in a significant change in the hydrology of the Chide Arroyo. What was once an ephemeral, dry arroyo is now a perennial stream due to NAPI irrigation return flows and releases of excess irrigation water. This combination of events in the Chinde Area has resulted in the development of two wetlands along the Chinde Arroyo. One of the wetlands is located up-gradient of the mine lease and the second is located on the mine lease, up-gradient of the Big Fill.

To evaluate the combined hydraulic consequences of mining activities and NAPI influences, BNCC proposes to install six new monitoring locations along the Chinde Arroyo. The purpose of the new monitoring locations is to monitor hydrogeologic conditions in the Chinde Area as follows:

- The first monitoring location would be a drive point well that would be installed down-gradient of the NAPI fields and up-gradient of the wetland east of the mine lease. The purpose of this monitoring location would be to assess the groundwater quality immediately down-gradient of the NAPI.
- The second monitoring location would be a well installed adjacent to the wetland east and up-gradient of the mining activities. The purpose of this well would be to monitor water quality immediately up-gradient of mining activities.
- The third monitoring location would be a well installed in the Chinde Arroyo down-gradient of existing well QAC-1. The purpose of this well would be to monitor water quality down-gradient of the mine. Since this monitoring location is located off-lease it is anticipated that installation will be delayed due to the approvals that must be obtained. BNCC is proposing that a drive point be installed prior to well installation to expedite the collection of data. Once the necessary approvals are acquired for the monitoring location, the drive point will be removed and replaced with a monitoring well.
- The remaining three new monitoring locations would be piezometers installed in the wetland immediately up-gradient of the Big Fill. The purpose of these piezometers is to monitor groundwater elevations and enable groundwater flow direction to be determined.

Chinde Area Scope of Work

The scope of work of the BNCC Draft Groundwater Monitoring Plan Update includes:

- Installation of two new monitoring wells;
- Installation of three piezometers;
- Installation of two new drive point monitoring locations.

The objective of these six new monitoring locations is to characterize and monitor groundwater hydrogeologic conditions of the Chinde Area. The monitoring wells will be drilled using a direct push, rotasonic, or similarly effective drilling method. The monitoring wells will be drilled and constructed according to New Mexico Environmental Department's (NMED) Monitoring Well

Construction Guidelines. Due to the wet nature of the area, the piezometers will be installed using a hand augur. If the geologic formation proves to be too competent for a hand augur BNCC will evaluate an alternate method. The drive points will be installed using the most practicable method for the lithology. If the geologic formation is too competent and a drive point is unfeasible, then BNCC will work with OSMRE to evaluate alternatives. Table 1 – Monitoring Locations Details summarizes the monitoring locations.

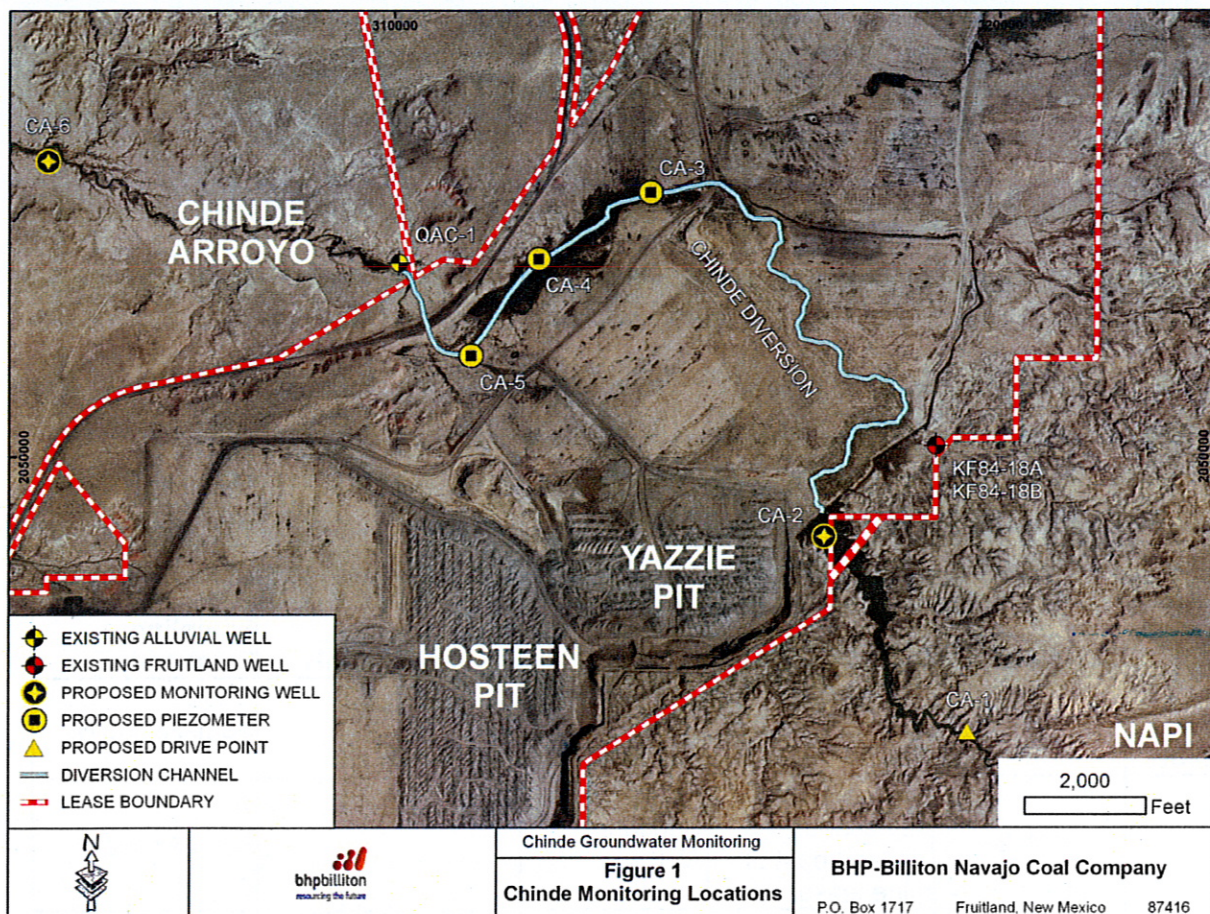
The three new monitoring locations, CA-1, CA-2, and CA-6, will be sampled on a semi-annual schedule according to the frequency described in Chapter 6 of Navajo Mine Permit NM-0003F. These new monitoring locations will be sampled for parameters listed in Table 6-4 Navajo Mine Groundwater Sampling Parameter List (Bedrock and Alluvial Wells) in Navajo Mine Permit NM-0003F. The three remaining monitoring locations, CA-3, CA-4, and CA-5, will have static water level measurements collected quarterly. BNCC will sample these six new monitoring locations for a period of two years. At the end of this period, BNCC will discuss with OSMRE the efficacy of continued monitoring of the new monitoring wells.

Table 1 - Monitoring Locations Details

Target Unit	Well Designation	General Location	Monitoring Type	Screen Interval	Sampling Frequency
Top of competent bedrock	CA-1	Chinde Arroyo – down-gradient of NAPI	Drive Point	Dependent on refusal	Semi-Annually
Alluvium	CA-2	Chinde Arroyo – adjacent to wetland east of mine lease	Monitoring Well	Varies – 5' above the water table plus thickness of aquifer	Semi-Annually
	CA-3*	Chinde Arroyo – wetland on lease	Piezometer		Quarterly
	CA-4*	Chinde Arroyo – wetland on lease	Piezometer		Quarterly
	CA-5*	Chinde Arroyo – wetland on lease	Piezometer		Quarterly
	CA-6	Chinde Arroyo – down-gradient of mine lease	Drive Point/ Monitoring Well	Dependent on refusal/ Varies – 5' above the water table plus thickness of aquifer	Semi-Annually

*Water level measurements only.

BNCC acknowledges that some proposed monitoring locations may require authorizations from landowners and federal agencies. BNCC will seek the appropriate authorizations required to implement this plan upon approval from OSMRE. In addition, the locations of the new monitoring wells described in this submittal are considered approximate and could change depending on land access and drill rig accessibility. Approximate locations of the new monitoring locations can be found on Figure 1 - Chinde Monitoring Locations.



Thank you for your consideration of the above proposed modifications to enhance existing monitoring and proposed supplemental monitoring programs. We look forward to working with you on the proposed enhancements.

If you have any questions or comments, please contact Kara Hart at 505-598-2134.

Yours sincerely,

Steven Perkins
 Superintendent Environmental Permitting and Technical Services