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BHP Navajo Coal Company

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12-03-09-04

March 6, 2012

Mr. Mychal Yellowman, Navajo Mine Coordinator  
Indian and Federal Programs Team  
Office of Surface Mining/Western Regional Coordinating Center  
P.O. Box 46667  
Denver, CO 80201-6667

**Re: Navajo Mine Permit Number NM-0003F  
Groundwater and Surface Water Monitoring  
Responses to OSM's Comments**

Dear Mr. Yellowman,

Thank you for taking the time to meet with representatives of BHP Navajo Coal Company (BNCC) on Feb. 27, 2012 to discuss OSM's comments on ground and surface water monitoring at Navajo Mine. BNCC is submitting this letter to ensure a common understanding of outcomes resulting from discussions during the presentations given in your office on February 27. A summary of outcomes, as well as a general timeline for completion, is provided below.

**Groundwater**

**Bitsui Area**

- 1) Existing well Bitsui-2 will be used for #8 seam groundwater level monitoring and for groundwater sampling.
- 2) Existing wells KF84-16 and KF83-1 will be used for monitoring #8 seam groundwater levels.

**Cottonwood Arroyo Area**

- 1) A new alluvial well (proposed CWA-4) will be installed to replace the hand-dug, dry well QACW-2B along the main Cottonwood Arroyo just south of Dixon.
- 2) A new alluvial well (proposed CWA-1) will be installed to replace the abandoned well GM-17 along the North Fork of the Cottonwood Arroyo just inside the lease boundary.

- 3) Two new alluvial wells (proposed CWA-2 and CWA-3) will be installed along the Main Fork and South Fork, respectively, of the Cottonwood Arroyo near the lease boundary.
- 4) Two new Fruitland wells (proposed KF-1 #3 and KF-1 #8) will be installed on the northwest side of Area IV North near the lease boundary.

#### Groundwater Reference Criteria

- 1) Criteria will be recalculated using the entire set of baseline data from 10/17/2011
- 2) Reference criteria will be established for QACW-2
- 3) QACW-2B is a dry, unsuitable hand-dug well and will be replaced by well CWA-4; new reference criteria will be developed for well CWA-4
- 4) GM-17 well will be replaced by proposed well CWA-1; local variation in natural soil properties precludes comparing these two wells as being chemically equivalent so new reference criteria will be developed for CWA-1
- 5) Reference criteria is based on the median + 2 median absolute deviations for the baseline monitoring data through year 2001; detection values are calculated as the product of 0.5 and the detection limit
- 6) Magnesium and potassium have been removed as reference criteria parameters and replaced by pH because magnesium and potassium are not constituents that are associated with mining activities, and increases in these ions as well as other ions are captured by the reference criterion for TDS
- 7) Reference Criteria have been established for well QACW-2 as requested; detection values were calculated as the product of 0.5 and the detection limit
- 8) If two or more of the same groundwater reference criteria are exceeded at any one monitoring location over four consecutive sample collection periods, then subsequent groundwater samples from that location will be analyzed for dissolved iron, dissolved manganese, nitrate-nitrite, and boron in addition to the standard suite of parameters listed in Table 6-4.

#### Chinde Arroyo Update

- 1) One off-lease, upstream pre-packed well (CA-1) will be installed via hand augur
- 2) CA-2 will be installed near the lease boundary as a well to monitor water quality of Chinde Arroyo up gradient of mining activities.
- 3) One off-lease, downstream pre-packed well (CA-6) may be installed via hand augur; this will be replaced by a drilled well once final approvals have been acquired
- 4) Three piezometers (CA-3, CA-4, CA-5) will be installed in the "big fill" wetland area;
- 5) All Chinde wells and piezometers will be monitored quarterly for a period of two years, followed by an assessment of continued monitoring frequency

#### Low Pit – Well Abandonment and Replacement

- 1) Due to a local change in mine plan, three existing wells (KF84-20A, KF84-20B, KF84-20C) will be abandoned; these monitor #7 seam, #4 seam and #3 seam, respectively
- 2) Replacement wells will be installed into the same monitoring horizons approximately 350 feet to the east, just inside the incidental boundary revision

#### Implementation Schedule

- 1) All replacement wells, with the exception of CA-6, are scheduled to be installed during April and May of 2012
- 2) Chinde downstream drilled well CA-6 will be installed when necessary approvals are acquired
- 3) Well development is scheduled to be completed during June, 2012
- 4) The monitoring plan revision to the permit is planned for submittal in August, 2012

#### Surface Water

##### Chinde Arroyo

- 1) One continuous flow gauge will be installed upstream, off lease in the proximity of agricultural fields.
- 2) One continuous flow gauge will be installed on-lease, downstream of the "big fill"

##### Cottonwood Wash

- 1) Four upstream flow gauges will be installed (one each) along the North Fork, Middle Fork and two branches of the South Fork
- 2) Above mentioned upstream gauges will be installed at the outfall of culverts along the proposed Burnham Road re-route
- 3) One downstream flow gauge will be installed on an already existing cable structure across the channel; periodic channel surveys will confirm accurate channel cross section
- 4) All stations will consist of flow meters to sample flow quantity and water samplers for water quality analysis

##### Surface Water Analytical Update

- 1) Dissolved and total metals aluminum, arsenic, cadmium and lead; total mercury; and nitrate, have been added to the analysis suite
- 2) Surface water reference criteria is not necessary due to adding of dissolved metals to the analysis suite (see number 1 above)

#### Implementation Schedule

- 1) Chinde gauges upon approval of off-lease monitoring
- 2) Cottonwood upstream gauges dependent on permit approval and construction schedule of Burnham Road re-route; proposed for June 2012 (North Fork) and October 2012 (Middle and South Fork)
- 3) Cottonwood downstream monitoring scheduled for completion in May 2012

Thank you for your time and consideration of these modifications to our ground and surface water monitoring programs. If you have any questions regarding this letter, please contact me at 505-598-2821 or [steven.r.perkins@bhpbilliton.com](mailto:steven.r.perkins@bhpbilliton.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Perkins', with a stylized flourish at the end.

**Steven Perkins**

Superintendent Environmental Permitting and Technical Services