



GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax



PETER MAGGIORE
Secretary
PAUL R. RITZMA
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 12, 2000

40-8903

Roy Cellan, Corporate Manager
Homestake Mining Company, Reclamation
P.O. Box 98
Grants, NM 87020-0011

RE: Request for Additional Information, DP-200, Homestake Mining Company

Dear Mr. Cellan:

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) is in receipt of the ground water discharge plan renewal application materials dated July 14, 2000 for the Homestake Mining Company (HMC) Grants Reclamation Site, DP-200. The GWQB has reviewed the application and has determined that additional information is necessary to complete the technical review of the application. This letter serves as a preliminary request for additional information necessary to: 1) evaluate the corrective action plan (CAP) for compliance with the New Mexico Water Quality Control Commission (WQCC) Regulations, and 2) determine the adequacy of the CAP for the NMED's consideration of supporting deletion of the site from the National Priorities List (NPL). Please note and/or respond to the following items as required.

I. Compliance With the WQCC Regulations

Pursuant to WQCC Regulation 4105.A.2, HMC is currently not required to have an approved Abatement Plan for ground water remediation of non-radiological pollution at the Grants Reclamation Site because the abatement is conducted under the authority of the Environmental Protection Agency (EPA) pursuant to the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). If the site is deleted from the NPL, this exemption is no longer applicable. However, WQCC Regulation 4105.A.6 provides for exemption from an Abatement Plan if the abatement is conducted under the authority of an approved discharge plan, and

NMSSOI Public

is consistent with the requirements and provisions of Sections 4101, 4103, 4106.C, 4106.E, 4107, and 4112 of the WQCC Regulations. In preparation for possible removal of the HMC Grants Reclamation Site from the NPL, HMC's July 14, 2000 discharge plan renewal application presents information to demonstrate compliance with the abatement plan requirements outlined in these sections. The GWQB submits the following preliminary comments on this portion of the application:

1. WQCC Regulation 4101

The discharge plan renewal application states:

"The methods Homestake is using to contain and remediate the existing concentrations of pollutants within the contaminant plume at the Grants Reclamation Site as outlined in the existing CAP and the existing DP-200 discharge plan are designed to ensure that the ground water at the site boundary is protected for use as domestic and agricultural water supply....," and

"...It must be noted that the domestic use of the ground water from the San Mateo Alluvium in the sub-divisions located south of the Homestake property is limited to lawn and garden irrigation and some agricultural uses such as livestock watering and small farm irrigation. The natural quality of the alluvial water in these areas is high in sulfate and TDS which does not promote its use for drinking. It also should be noted that in 1985, Homestake provided to the property owners of the subdivisions free hook-ups to the Milan municipal water system, plus free water use for a 10 year period."

Please note that Section 4101 of the WQCC Regulations provides for the abatement of ground water pollution so that "...all ground water of the State of New Mexico which has a background concentration of 10,000 mg/L or less TDS, is either remediated or protected for use as domestic and agricultural water supply....," and that "[t]he standards and requirements set forth in Section 4103 of this Part are not intended as maximum ranges and concentrations for use, and nothing herein contained shall be construed as limiting the use of waters containing higher ranges and concentrations."

To satisfy the requirements of WQCC Regulation 4101, HMC must demonstrate that the remediation activities at the Grants Reclamation Site will abate *all* ground water pollution (i.e., on-site and off-site non-radiological contamination) caused by its former operations, even if elevated background concentrations of certain constituents suggest naturally poor ground water quality. In accordance with WQCC Regulations 3101 and 4101, the natural quality and current uses of the San Mateo Alluvium do not preclude the NMED from protecting or requiring remediation of the aquifer for future domestic and agricultural use.

The CAP referenced in the discharge plan renewal application provides for abatement of ground water pollution *within the site boundary*, and does not specifically address off-site ground water contamination. In addition, the provision of an alternative drinking water supply to residents of the adjacent subdivisions does not meet the requirements of WQCC Regulation 4101.

Specific questions regarding the revised background concentrations proposed in the discharge plan application and the effectiveness of the CAP in addressing off-site contamination are discussed in Parts II and III of this letter.

2. WQCC Regulation 4103

A. Part 4103.A of the discharge plan renewal application states:

"...There is no contamination in the upper portion of the vadose zone except directly beneath the tailings area. This area will be flushed with clean water delivered through the toe drains when dewatering of the tailings is completed to ensure that contaminants have been removed from this portion of the vadose zone."

The GWQB understands that the objective of this proposal is to direct the contaminants through the vadose zone to the saturated zone to be captured by the alluvial collection wells as part of the existing CAP. The GWQB has concerns about the technical feasibility and effectiveness of this proposal, and is not satisfied that flushing the vadose zone through the toe drains is consistent with the intent of WQCC Regulation 4103.A (preventing the mobilization and migration of vadose zone contaminants into ground water). Please submit additional information on the proposed vadose zone flushing process. Alternatively, HMC may submit technical details for the final tailings covers to demonstrate that the erosion protection cover will provide an adequate barrier to prevent infiltration of water through the impacted vadose zone and subsequent contamination of ground water.

B. Part 4103.B of the discharge plan renewal application states:

"The site boundary is the potential place of withdrawal for present or reasonably foreseeable future use... The methods outlined in the CAP and the existing discharge plan are designed to ensure the WQCC standards or approved background standards are met at the site boundary."

In accordance with WQCC Regulation 4103.B, HMC must abate all (non-radiological) ground water pollution caused by its former operations such that ground water at *any* place of withdrawal for present or reasonable foreseeable future use either

meets the approved baseline concentrations or the standards set forth in WQCC Regulation 3103. As previously stated, HMC's corrective action obligations for non-radiological ground water pollution are not restricted to contaminated ground water within the site boundary.

3. WQCC Regulations 4106.C and 4106.E

The GWQB's questions and comments concerning the effectiveness of the abatement plan are presented in Part III of this letter - "Protectiveness of the Remedy."

II. **Proposed Background Concentrations**

The discharge plan renewal application contains a comprehensive statistical analysis to investigate and propose revised background concentrations for molybdenum (Mo), nitrate (NO₃), Selenium (Se), sulfate (SO₄), total dissolved solids (TDS), and uranium (U). The statistical methods to generate the proposed background concentrations will be thoroughly reviewed by the GWQB in cooperation with the EPA in upcoming weeks; however, the GWQB has noticed that the proposed background concentrations for some constituents (e.g., Mo, NO₃, SO₄, and TDS) are substantially higher than the 1999 ranges presented in the renewal application. In light of this observation, the GWQB offers the following preliminary questions and comments regarding the proposed background concentrations:

1. Application of San Mateo Background Concentrations to the Chinle Formation

Part 3.0 - "Ground Water Hydrology of the Upper Chinle Aquifer" in Attachment A of the discharge plan renewal application compares ground water quality in the Upper Chinle aquifer to the proposed background concentrations for the San Mateo Alluvium. The GWQB is aware of the likely connection between the San Mateo Alluvium and part of the Upper Chinle aquifer due to the easterly and westerly faults and displacement of the Chinle layers at the site (based on previous annual reports and Drawings 3.2-1, 3.2-3, and 3.2-4 from the original discharge plan application, dated November 1981). However, because background concentrations of ground water contaminants may vary substantially at different depths in the *same* aquifer, the GWQB does not routinely accept the application of background concentrations from the one aquifer to a different geologic unit.

Please submit additional information on the natural water quality of the Upper Chinle aquifer (for comparison with water quality data from the San Mateo Alluvium) so the GWQB can determine whether the application of San Mateo Alluvium background concentrations to the Upper Chinle aquifer is appropriate. HMC may compare ground water quality data obtained from up-gradient San Mateo Alluvium wells with regional water quality data for the Upper Chinle aquifer. Please note that the GWQB may require the installation of up-gradient wells into the Upper Chinle aquifer to obtain background water quality data for that unit if regional data are insufficient.

2. Use of Far Up-Gradient Wells in Determining Background Concentrations

The discharge plan renewal application states that the Far Up-Gradient wells used in the statistical analysis were not installed by HMC, and that "[b]ecause completion logs are not available, it cannot be determined whether these wells access alluvial ground water, water from a deeper water bearing unit, or some combination from both ground water sources."

The GWQB does not believe that the inclusion of wells that are completed in an unknown water bearing unit in the statistical analysis is an appropriate method to obtain a representative data set for determining background concentrations in the San Mateo Alluvium. A statistical comparison of pollutant concentrations between the Near Up-Gradient and Far Up-Gradient wells does not provide adequate justification for inclusion of data from the Far Up-Gradient wells in the final data sets. Therefore, the GWQB will not approve any proposed background concentrations that are based on statistical analyses conducted with the Far Up-Gradient or Combined data sets unless HMC locates well completion records or determines well completion by some other method (e.g., performing a video survey of the wells to observe well construction) for the Far Up-Gradient wells and can demonstrate that their inclusion in the final data sets is appropriate.

3. Preventing Biased Analyses

The Near Up-Gradient data set was compiled from nine wells including wells P, Q, R, DD, ND, P1, P2, P3, and P4. Wells P, Q, R, and DD have substantially more historical data than wells ND, P1, P2, P3, and P4. Consequently, the Near Up-Gradient data set is inherently weighted toward the older wells. The GWQB is concerned that failure to correct for this potential bias may produce inaccurate statistical characterizations of background water quality data distributions (e.g., a non-weighted Near Up-Gradient data set for NO₃ may be more appropriately characterized by a normal distribution curve). The GWQB is also concerned that an inaccurate statistical characterization of background water quality data for a particular constituent may prompt the use of an inappropriate statistical method to determine a revised site standard.

Please investigate methods to correct for this bias in the Near Up-Gradient data set (e.g., only using data from years when all of the Near Up-Gradient wells had common sampling events). HMC's proposal for correcting the data set for this bias must be reviewed and approved by the GWQB before any statistical analyses are re-run.

4. Trends in Near Up-Gradient Wells

To provide for an accurate assessment of background water quality at the Grants Reclamation Site, the GWQB must be assured that the wells selected as Up-Gradient wells have not been impacted by HMC's former operations. Please submit additional information demonstrating that the selected wells have not been impacted by HMC's former operations. Submitted information should include revised graphs illustrating trends in pollutant

concentrations for all near Up-Gradient wells. The revised graphs should include all historical data for Mo, NO₃, Se, SO₄, and TDS, and should be plotted using consistent scale intervals to allow GWQB staff to compare data among different wells. Please note that the GWQB may require additional information based on its review of submitted data.

5. Other General Comments

- A. Please provide the GWQB with graphs illustrating Near Up-Gradient data distributions for each constituent.
- B. Table 2-1 in the discharge plan renewal application presents the 1999 ranges for pollutant concentrations as a comparison with the revised background concentrations (that are based on different combinations of up-gradient wells) proposed in the application. The background concentrations presented in the 1999 Annual Report for the Grants Reclamation Site are based upon wells P, Q, R, DD, ND, P1, P2, P3, P4, 920, and 921. Please clarify whether the 1999 ranges presented in Table 2-1 of the discharge plan renewal application are based upon the same wells, or whether the 1999 ranges are based upon the final data sets compiled for the statistical analyses.

III. Protectiveness of the Remedy

Before the NMED can support deletion of the Grants Reclamation Site from the NPL, it must be assured that the CAP has and will continue to effectively abate non-radiological ground water pollution both on and off HMC's property. The GWQB has reviewed HMC's Annual Reports and requests the following additional information to assist in an expedited and thorough review of the CAP:

1. General Comments

- A. Please provide the GWQB with additional tables to provide a summary of historical and current data for all down-gradient (on-site and off-site) wells included in Table 4.1-1 of the 1999 Annual Report. The new tables should be organized by geographic location and aquifer (e.g., Broadview Acres - San Mateo Alluvium), and should include the following information: well number, well depth, screened interval, water level, the highest historical concentration and 1999 values for *all* constituents of concern, and an indicator to highlight whether the well is out of compliance with current site standards. In addition, please illustrate the total number of wells completed in each location/aquifer and the percentage of those wells that exceed current site standards (based on 1999 data).
- B. Please submit revised graphs illustrating trends in pollutant concentrations for all down-gradient (on-site and off-site) Table 2 wells. The revised graphs should include all historical data for *all* constituents of concern, and should be plotted using

consistent scale intervals to allow GWQB staff to compare data among different wells. The *current* site standard for each constituent should also be plotted on the graphs for comparative purposes. HMC may also plot the proposed background concentrations.

- C. The GWQB has not been able to locate any *current* geologic cross sections that provide detailed illustrations of the San Mateo Alluvium and Chinle aquifers. The GWQB also needs additional cross sections through the contaminant plumes to illustrate the extent of the contamination and concentration contour lines for the Grants Reclamation Site.

Please submit at least two (2) updated *geologic* cross sections (i.e., one north-south section and one east-west section based on current well logs) and two (2) current *plume* cross sections to provide detailed illustrations of the local geology and contaminant plumes. GWQB staff will assist HMC in selecting the exact locations for the requested cross sections and which wells to include in the illustrations. Please bring a current map of the area surrounding the Grants Reclamation Site, complete with plots of all wells included in Table 4.1-1 of the 1999 Annual Report.

- D. A critical element of the GWQB's review of the CAP's effectiveness is a comparison of *current* water quality data with the projected pollutant concentrations generated from previous ground water modeling efforts associated with selection of appropriate abatement activities. The discharge plan renewal application provides projections for abatement plan completion dates (in terms of water quantity), but does not provide a comparison between current ground water quality and that which the CAP was expected to achieve at this time.

Please provide additional information (e.g., summary tables, graphs, and descriptive narrative) that *specifically* compares current ground water quality at the Grants Reclamation Site with that which was predicted by previous modeling efforts.

2. Off-Site Ground Water Pollution

The Part 4103.B.2 of the discharge plan renewal application states:

"There are some concentrations of selenium which have recently been identified in the alluvial aquifer to the south of the site boundary that are presently slightly greater than the proposed background standards... These concentrations are being abated by pumping and mixing this water with water pumped from the same aquifer but containing much lower concentrations of selenium and using it in our irrigation program.... The irrigation program was approved earlier by both NMED and NRC."

Roy Cellan, DP-200
September 12, 2000
Page 8

Please note that the NMED's review of HMC irrigation program was limited to determining whether WQCC Regulation 3104 - "Discharge Plan Required" was applicable to the program. The NMED's review of the proposed irrigation program did not serve as an evaluation of the program as a component of the CAP to address off-site contamination. The NMED's "approval" of the irrigation program (as referenced above) represents its determination that the proposal was exempt from discharge plan requirements at the time of submittal, pursuant to WQCC Regulation 3105.C.

If HMC intends to use the irrigation program as a component of the CAP, please submit detailed information on the program (e.g., which wells are pumped, purging rates, modeled predictions of the effects, etc.) to demonstrate its ability to effectively address off-site ground water contamination.

The GWQB appreciates your patience in the discharge plan renewal process. I look forward to meeting with HMC representatives on September 18th to clarify the GWQB's requests, assist HMC in completing technical details of the discharge plan renewal application, and discuss NPL deletion requirements. If you have any questions before that date, please do not hesitate to contact me at (505) 827-2782.

Sincerely,



Mary Heather Noble
Ground Water Quality Bureau
Pollution Prevention Section

cc: Thomas Skibitski, District Manager, NMED District I
Birgit Landin, GWQB, SOS
Petra Sanchez, EPA
Ken Hooks, NRC
Jane Gunn, NRC
Ron Waterland, HMC
George Hoffman, Hydro-Engineering, LLC