

(10)

**HOMESTAKE MINING COMPANY
OF CALIFORNIA**

GRANTS OFFICE

Alan D. Cox
Project Manager

9 June 2005

Mr. Jerry Schoeppner
State of New Mexico
Ground Water Pollution Prevention Section
Environmental Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Re: Grants Reclamation Project

**Homestake Response to NMED 1/20/05 Comments on proposed ground water
background concentrations for HMCo Grants Millsite**

Dear Mr. Schoeppner:

We received the New Mexico Environment Department (Department) letter as referenced above regarding comments on the Homestake Mining Company (HMCo) document entitled "Grants Reclamation Project – Background Water Quality Evaluation of the Chinle Aquifers" dated October 2003 and the associated Statistical Evaluation report. The letter comments covered specific topics related to these reports as well as topics that pertain to an earlier, and similar, background water quality document concerning the San Mateo alluvial aquifer at the site.

Attached please find our response to the issues and comments raised by the Department. We trust that these responses are sufficient to allow the Department and HMCo to mutually agree on the background standards that are appropriate for the Grants site. We believe that the Nuclear Regulatory Agency and EPA are prepared to accept the proposed background standards based upon discussions with their staff members charged with regulatory oversight and management at the project.

I will be contacting you in the very near future such that we can arrange a meeting to discuss the proposed background water quality standards and answer any remaining questions that you might have. As indicated in our discussions with K. Myers of your staff, we would like to reach a final decision in the near future as this issue has a material bearing on time critical decisions related to several other permitting and planning activities with other regulatory agencies that are involved with, and have regulatory jurisdiction over, the Grants site.

Thank you for your time and attention on this matter. As indicated, I will call within the next few days to identify a mutually acceptable meeting time and place to discuss the issue. This will allow you, and members of the Department staff, the opportunity to review our response comments prior to the meeting.

If you have any questions in the interim, please contact me in our Grants office at (505) 287-4456 or via cell phone at (505) 400-2794.

Sincerely yours,


HOMESTAKE MINING COMPANY
Alan D. Cox

Enclosure

Cc: R. Chase - SLC
B. Ferdinand - SLC
G. Hoffman – Hydro eng., Casper



NEW MEXICO ENVIRONMENT DEPARTMENT LETTER
DATED JANUARY 20, 2005

HOMESTAKE MINING COMPANY RESPONSE TO COMMENTS

Comment / Recommendation No. 1: Background concentrations for the alluvial data set should be calculated based on the last 10 years of data.

Response to Comment / Recommendation No. 1: The commenter suggested that the background data set be restricted to the last 10 year interval based on the physical hydraulic characteristics of the aquifer. We believe that all data from locations that potentially could affect the background levels at the site should be considered. The distance from the near-up-gradient wells to the point of exposure (POE) is up to 12,000 feet. The upgradient ground water velocity has been determined to be 0.7 ft/day, which would require a period of 47 years for flow to reach the POE. The data used in the alluvial analysis is for a 23-year interval from 1976 through 1998. We know of no existing or planned pumping of the alluvial aquifer that would drastically affect the transit time of flow from the farthest sampling point to the POE. Accordingly, a longer sampling period is more desirable from the standpoint of determining variation in background values for the site.

However, we reevaluated the background analysis using only data from the last 10-year period. The results are given in Table 1 below. The results show a decrease in the nitrate background value, an increase in the selenium and uranium background values, and no significant change in the molybdenum and chloride background values.

TABLE-1
BACKGROUND VALUES (10 YEAR PERIOD vs. PROPOSED LEVELS)

CONSTITUENT	LAST 10 YR (1995-2004) 95% LEVEL	PROPOSED BACKGROUND LEVEL
Selenium	0.32	0.27
Uranium	0.16	0.15
Molybdenum	0.04	0.05
Sulfate	1500	1870
Chloride	71	71
TDS	2734	3060
Nitrate	12	23

We believe that the use of the longer period of record is important to take into account the natural spatial and temporal variations that occur within the aquifer, particularly when the analysis of a subset of the available data produces both increases and decreases in background concentrations for different constituents. The focus on the anticipated changes in the statistical analysis for nitrate is also questionable since there are natural biochemical processes that can dramatically affect nitrate concentrations in addition to influences from alternate sources such as fertilizer or livestock waste.

Comment / Recommendation No. 2: Outlier criteria should be applied to individual data sets and to the raw data instead of after duplicate results have been averaged.

Response to Comment / Recommendation No. 2: The two concerns expressed by the commenter are somewhat subjective as to how they should be addressed. The first suggestion was that data from each well should be considered separately when considering outliers. We believe that continual migration of ground water constituents over the 23-year sampling period has occurred. Fluctuations in natural concentrations that existed in one area will likely be encountered in another area at a future time. Therefore, we applied the outlier criteria to the entire data base, which more appropriately treats the up-gradient area as a ground water system rather than a number of isolated systems that do not interact within the overall ground water system.

The second issue is whether to average duplicate samples prior to applying the outlier criteria or to apply the criteria prior to averaging. We sought guidance on this prior to publishing the report but found no definitive guidance.

Regarding the two suggestions above, we reviewed our analysis and found that no data would be subject to removal as an outlier if the criteria were applied prior to averaging. Thus averaging of duplicates after applying the outlier criteria will not change the results. The additional analysis shows that no additional outliers would be found if the criteria are applied to each well individually.

Comment / Recommendation No. 3: Revision of background values may be required in the future.

Response to Comment / Recommendation No. 3: It is Homestake's belief the background values need to be finalized based on values determined by appropriate sampling and statistical base results. The Homestake program to determine background water quality levels have been ongoing for 23 years. Exhaustive analysis and statistical reviews have been performed on the data a number of times including an evaluation per this most recent request to examine the last 10 years of monitoring results. As clearly indicated by these efforts, the appropriate monitoring and statistical based information has been indeed utilized to determine the appropriate background values for the site.

Comment / Recommendation No. 4: Why are some of the proposed Chinle background concentrations higher than the alluvial concentrations.

Response to Comment / Recommendation No. 4: There are two primary observations related to the identified higher background concentrations. In regard to uranium and TDS concentrations, the Chinle mixing zone background values are determined using data from wells where the ground water has been in contact with the Chinle aquifer materials. These materials are dramatically different from alluvial materials and contact with the local mineralization is sufficient to contribute to the slightly higher uranium and TDS concentrations in this zone. Note, however, that only minor differences exist between the background concentrations in the alluvial aquifer and the Chinle mixing zone. These

differences might only reflect temporal changes in the makeup of water that moves into the mixing zone. In particular, the TDS concentration of ground water flowing in the Chinle mixing zone can change appreciably as major ions are dissolved from the formation materials.

The second observation is that the selenium, sulfate, and TDS concentrations are greater in the Lower Chinle aquifer than in the other aquifers. The Lower Chinle aquifer material is made of fractured shale which differs significantly from the Upper or Middle Chinle material which is generally sandstone. The Lower Chinle ground water flows through primary and secondary permeability pathways in the shale, while the Upper and Middle Chinle ground water flows through more homogenous sandstones. Therefore, it is not surprising that these different materials result in different selenium, sulfate and TDS concentrations in the non-mixing zone. The concentrations of some constituents in the Lower Chinle aquifer increase significantly with travel distance from the outcrop area.

Comment / Recommendation No. 5: Background concentrations may be approved for only a delineated area of the aquifer.

Response to Comment / Recommendation No 5: Homestake generally agrees that the background concentrations for this site should be established for specific areas and aquifers. These areas need to include the portion of the aquifers where the San Mateo alluvial system affects the water quality. The San Mateo alluvial ground-water flow influences the alluvial ground-water quality in Section 32, T12N R10W and Section 4, T11N R10W, as well as those specified in the comment letter. Therefore we suggest that the areas be defined as, Township 11 North, Range 10 West in Sections 2, 3, and 4 and Township 12 North, Range 10 West in Sections 22-29, and 32-36.