UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF MAILCODE :
WU-16J

JUL 18 2008

CERTIFIED MAIL 7001 0320 0006 1452 1921
RETURN RECEIPT REQUESTED

Jonathan C. Cherry, P.E.
Manager, Environment & Government Affairs
Kennecott Eagle Minerals Company
1004 Harbor Hill Drive, Suite 103
Marquette, Michigan 49855

Re: Request for Additional Information for the Underground Injection Control Permit Application for the Treated Water Infiltration System, United States Environmental Protection Agency UIC Permit Application No. MI-103-5W20-0002

Dear Mr. Cherry:

We have completed the initial review of the permit application for the facility referenced above and determined that additional information is necessary to clarify, modify or supplement the information you provided. Please refer to the enclosed Request for Additional Information and respond within forty-five days of your receipt of this letter. When we determine that the information you provide is sufficient for a permitting decision, a draft decision will be made. A statement of basis for the decision will be prepared and supplied to you as well as the public for comment.

If you have any questions, please feel free to contact Dr. Stephen Roy of my staff at (312) 886-6556 or roy.stephen@epa.gov.

Sincerely,

for Rebecca L. Harvey, Chief
Underground Injection Control Branch

Enclosure

Request for Additional Information

Permit Application for the Kennecott Eagle Minerals Company Treated Water Infiltration System, United States Environmental Protection Agency Underground Injection Control Permit Application #MI-103-5W20-0002

1. The certification statement that appears on the EPA Underground Injection Control Permit Application (Form 7520-6) is different from the one found in Title 40 of the Code of Federal Regulations (40 CFR) Section 144.32(d). We realize that you used the official EPA form; nonetheless, please submit a certification statement that matches the requirements of 40 CFR 144.32(d).

   Certification Statement from 40 CFR 144.32(d):

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

2. App. A, section 2.2.4, Hydraulic Characteristics of Quaternary Formations (p. 15): "At this location, the average D zone transmissivity is about 6,100 gpd/ft and is generally consistent throughout most of the pumping area." What is the basis for this assertion?

3. App. A, section 3.1: Double ring infiltrometer tests are only useful for measuring soil properties for the first few meters below ground surface. Given the thickness of the injection zone at this site (at least 70 feet or 21 meters) and the heterogeneity and anisotropy of soil properties at this site, larger scale tests would be more appropriate for providing a realistic infiltration rate under operating conditions for the TWIS. Permeability should be measured via monitoring wells screened in the unsaturated zone. (Cadmus, p. 5) Please provide data justifying use of the value measured by the double ring infiltrometer to the entire injection zone.

4. App. A, section 4.2.2, Quaternary Deposit, fifth paragraph, referencing Figure 19, states that the observed thickness of the vadose zone increases towards the southeast. Figure 19 clearly shows thickness increasing to the northeast. Similarly, referencing Figure 20, the text states that "These confining units are not significantly present in approximately the southeastern two-thirds of the proposed discharge area." Review of Figure 20 shows thinning of the confining unit to the northeast of the Treated Water Infiltration System (TWIS). Please explain.

5. App. A, Fig. 9, 10, and 26 – 29 show groundwater flow directions in the pre-operational state. To what extent will the presence of the groundwater mound modeled in App. E change these flow patterns?

6. App. A, section 4.4.2 Groundwater Quality: We are concerned about possible reaction between introduced water and the native groundwater in this area. Table 5 presents data about pH but not Eh or dissolved oxygen: have these properties been measured? How will these parameters in the effluent compare to the background values of the water in the aquifer? What will be the impact of adding this volume of water with these characteristics to the aquifer? Please provide information about the mineralogic composition of the injection zone. Do these sediments contain significant concentrations of metals available for mobilization? (Cadmus pp. 8-9)

7. App. C, Table 1-1, Wastewater composition. Drinking water standards include maximum contaminant levels (MCLs) for some contaminants not listed in this table. Will there be any organics or cyanide in the wastewater from any of the various sources? Will there be any alpha particle, beta particle or photon emitters (e.g., radium, thorium, uranium) from the inflow to the mine? Have any of the fluids that will contribute to the wastewater been analyzed for these contaminants?

8. App. C, Fig. 1 shows a "Treated Water Pump" but this does not seem to be described in the text. App. D, Fig. 1 shows a direct pipeline from the WWTP to the TWIS but App. D, Fig 2 says "Treated Wastewater from Discharge Lagoon". Which one is correct? If there will be a pump, how does capacity of pump compare with the design capacity of the TWIS?

9. App. D, p. 2, section 2.2: 400 gpm * 60 min/hr * 24 hr/day * x 0.13368 ft^3/gal = 77,000 ft^3/day. At 0.5 ft/day application, this requires 154,000 ft^2, not 153, 000 ft^2. Sec. 2.3 has the area of the TWIS as 150 * 1020 =153,000 ft^2. Please explain this discrepancy. Given that one of the five cells comprising the TWIS will be resting at any given time, in theory, only 153,000 * 4/5 = 122,400 ft^2 will be available at any given time. If the need arises, can all five cells be used at once? What contingency plans have been made for periods when not all five cells are operable?

10. App. E, Golder & Assoc. report, page 4, section 2.4, first paragraph, last sentence, referencing Figs. 8 and 9, says that groundwater is flowing to the northwest in both Zone A and Zone D. These figures show flow to the northeast. Please explain this discrepancy.

11. App. E, Golder Associates Report, page 9, Section 4.1, Infiltration Rate: Did modeling take into account the planned operation having only four cells active at any one time? If not, what effect would this have?

12. App. E, Golder Associates Report page 11, Section 6.0, Conclusions,: third paragraph says that particle tracking shows infiltrated water will migrate to the northwest. Figs. 20 and 22 show flow to the northeast. Please explain the discrepancy.

13. App. E, Fig. 16 and Fig. 18 appear to be identical. Superimposing these figures on a light table shows the water table line to overlap exactly. There is no sign of a mound, even under the infiltration site. Are both of these figures correct? If the difference is that small, please plot them together at a scale which shows the difference.

14. App. E, Golder Associates Report, Fig. 19: This figure, particularly the 2 ft contour, is very different from Fig. 7 and Fig. 14 in the 2/06 Fletcher & Driscoll Report (App. B-7 of Environmental Impact Assessment submitted to the Michigan DEQ). The first is a steady-state 400 gpm simulation, the second a 10 yr simulation apparently using 74.3 gpm base case and the third the upper bound case. Please discuss the significance of the differences.

15. App. E, Golder Associates Report, Fig. 20 and 22 differ from Fig. 8 and 15 in the Fletcher and Driscoll report. Please discuss the significance of the differences.

16. Please explain why additional sensitivity analyses were not provided or run more sensitivity analyses to respond to the concerns stated in the Cadmus report (pp. 18-19).

17. MODFLOW modeling: Please provide demonstrations of convergence of the solution, closure and mass balance and any other calculational checks that were performed. Was the water table option used? (Cadmus, pp. 24-25)

18. Please provide information about the calibration of the numerical model. (Cadmus, p. 25)

19. The monitoring program presented in App. F is inadequate because it fails to demonstrate compliance with the non-endangerment requirement of 40 CFR 144.82(a)(1). Please propose a monitoring program which meets this requirement. It should include the location of the sampling and a justification for the parameters and the frequency of monitoring. The monitoring program must demonstrate that any interaction between the effluent and native water in the USDW does not endanger the USDW.

20. App. F, page 1, section 1.1: "If the measured specific conductance in the treated effluent tank exceeds operational thresholds, ..." What are these thresholds? App. C, section 1.2, indicates that water will be in compliance with Michigan's Part 22 Groundwater Water Quality Standards – how will monitoring only specific conductance demonstrate compliance? Will samples of waste water be taken from any other locations? If water exceeds operational thresholds, how quickly will the flow be returned to the WWTP? How will the system guarantee that water which does not meet appropriate standards does not enter the USDW?

21. Please provide a cost estimate for the closure of the TWIS. Section 9 of the application only discusses financial assurance for the State of Michigan and does not include any breakdown of the $17,000,000 figure set forth in the application. If Kennecott proposes to use a single mechanism to meet both State of Michigan and Federal requirements, Kennecott must submit documentation of the financial mechanism to allow determination whether the state mechanism is at least equivalent to the mechanisms specified in 40 CFR Subpart F and submit a "Letter Requesting the Use of a State Bond" (40 CFR 144.65(a)).