

February 19, 2009

Tom Hardgrove, Manager  
Environmental and Regulatory Affairs  
COGEMA Mining, Inc.  
and Pathfinder Mines Corporation  
P.O. Box 730  
935 Pendell Blvd.  
Mills, Wyoming 82644

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION, WEILFIELD RESTORATION REPORT, CHRISTENSEN RANCH PROJECT, COGEMA MINING, INC., IRIGARAY AND CHRISTENSEN RANCH IN SITU URANIUM RECOVERY PROJECT, SOURCE MATERIALS LICENSE SUA-1341 (TAC J00563)

Dear Mr. Hardgrove:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated April 8, 2008, (ADAMS Accession Package No. ML081060155), COGEMA Mining, Inc. (COGEMA) submitted a Wellfield Restoration Report for mine units 2 through 6 at its Christensen Ranch facility. NRC conditionally accepted the application for review in a letter to COGEMA dated May 13, 2008 (ADAMS Accession No. ML081330021) requesting that COGEMA confirm groundwater class of use designation from the Wyoming Department of Environmental Quality (WDEQ). COGEMA confirmed the groundwater class of use with the WDEQ and forwarded its response to the NRC in a letter dated July 28, 2008.

NRC staff has completed a safety review of COGEMA's Wellfield Restoration Report. NRC staff requires additional information from COGEMA in order to complete its assessment of the license renewal application. The additional information needed in order for staff to complete its review is identified in the enclosure. Within 30 days, please either provide the information requested or inform us of the date you expect to provide the information. We are available to meet with you to discuss the requested information.

If you have any questions concerning this letter, please contact me, either by telephone at (301) 415-7777, or by e-mail at [ron.linton@nrc.gov](mailto:ron.linton@nrc.gov).

T. Hardgrove

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In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

**/RA/**

Ron C. Linton, Project Manager  
Uranium Recovery Licensing Branch  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

Docket No. 040-08502

Enclosure: Request for Additional Information

cc: G. Mooney, WDEQ

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Ron C. Linton, Project Manager  
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Docket No. 040-08502

Enclosure: Request for Additional Information

cc: G. Mooney, WDEQ

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<b>NAME</b>	RLinton	BGarrett	BVonTill	RLinton
<b>DATE</b>	02/17/09	02/18/09	02/19/09	02/19/09

**OFFICIAL RECORD COPY**

**COGEMA MINING, INC.**  
**Wellfield Restoration Report, Christensen Ranch Project, Wyoming**  
**Request for Additional Information**

**General:**

1. Throughout the report for each mine unit, COGEMA estimates groundwater contaminant levels at the permit boundary. This estimation is not appropriate for groundwater contamination. After restoration is complete, the site is released for unrestricted use, including groundwater. The only groundwater that is protected from use is the exempted aquifer that is no longer considered an underground source of drinking water under the Safe Drinking Water Act. A more appropriate determination of groundwater contamination estimation is what contaminants will remain over time at the MW ring and at the aquifer exemption boundary. Provide an analysis of contaminants after stabilization at the monitoring well ring and the exempted aquifer for each mine unit.
2. COGEMA states on page 9-2, "significant attenuation of uranium will occur as groundwater from the wellfields moves into the down gradient reducing portions of the aquifer." For each mine unit, demonstrate that reducing conditions have been reestablished within the wellfield and/or exist at monitoring well ring wells down gradient of the wellfield such that they would likely cause attenuation of monitored constituents of concern.
3. In Section 4.4 of each mine unit restoration data package, COGEMA states that "best practicable technology (BPT) was applied throughout the Christensen Ranch groundwater restoration program. The process employed was completely justifiable in terms of performance and achievability in relation to health, safety, and minimization of adverse impacts to the environment." Discuss the BPTs employed during restoration at each mine unit and demonstrate that additional technologies would or would not likely achieve better restoration results.
4. Provide ore zone post-restoration water quality laboratory analysis reports for stability monitoring rounds 1 through 4 for mine units 2-6. The laboratory analysis reports are needed to compare reported laboratory concentration values to concentration values presented on spreadsheets and maps in the Restoration Report.

**Section 2.2**

1. Provide a discussion of the applicability of the restoration requirements in SUA-1341. Section 2.2 of the Restoration Report discusses the regulatory framework and laws and regulations pertinent to groundwater restoration at the Christensen Ranch Project Site. This section does not discuss the requirements for groundwater restoration listed in NRC Source Materials License SUA-1341.

Enclosure

### **Section 2.3**

1. Section 2.3 of the Restoration Report discusses groundwater classification and aquifer exemptions. The exact location of the aquifer exemption boundary for mine units 2 through 6 is not discussed in this section. The following is required:
  - a. Provide a discussion that defines the aquifer exemption boundary for each mine unit and show this boundary on a map or maps.
  - b. Provide documentation from the Environmental Protection Agency or the Wyoming Department of Environmental Quality (WDEQ) to support the location of each aquifer exemption boundary.

### **Section 7.3**

1. Section 7.3 of the Restoration Report discusses aquifer restoration processes used to restore the groundwater in the mine unit. Aquifer recirculation was typically done at the end of the reverse osmosis phase of restoration. The Report states, “the recirculation was found to increase oxygen levels to the wellfield and so volumes circulated were limited.” The Report also states, “In the future, it is recommended that recirculation not be done due to the introduction of oxygen through the circulation process.” The Report does not offer an explanation as to why this increase in oxygen levels may have occurred. The following is required:
  - a. Explain why oxygen was increased during recirculation phase of restoration.
  - b. Discuss whether increases in oxygenation during the recirculation phase are an indication that there are pockets of oxygenated water that are not removed during sweep or RO/permeate injection.

### **Section 8.0**

1. Section 8 of the Report states, “The reestablishment of long-term reducing conditions in the restored aquifer is an important factor that can serve to limit the migration of constituents affected by ISR mining because reducing conditions have a major effect on the mobility of many constituents associated with uranium roll front deposits, including u, se, as, mo, s.” In Section 9 the Report states, “significant attenuation of uranium will occur as groundwater from the wellfields moves into the down gradient reducing portions of the aquifer.” Demonstrate the basis for these comments by providing information that reducing conditions have been reestablished within the wellfields or exist at monitoring well ring wells down gradient of the wellfields such that reducing conditions would likely limit the movement of monitored constituents.
2. There are several groundwater wells listed as potential receptors in Section 8.2.2.2 that exist within the permit boundary and are associated with the production “K” sandstone.

Demonstrate that users of these wells have reasonable assurance that their water quality will not be impacted.

### **MU – 2 Restoration Data Package**

1. Page MU2 -18 of the Report states, “uranium is anticipated to be strongly adsorbed once groundwater from the wellfield moves outside of the ore body into the more reducing conditions down gradient.” As discussed in previous questions, demonstrate that these conditions exist and can be verified using monitoring well data.
2. Section 6.2.4 shows that using a post restoration wellfield average of 0.034 for uranium and a reduction factor of 6, uranium will be 0.088 mg/l which is above the target restoration value (TRV), or background, at 400 feet down gradient of the wellfield boundary, which is generally where the monitoring well ring is located. However, using the maximum uranium value of 4.34 mg/l of uranium from restoration well 2S100-2, and a reduction factor of 6, uranium would likely be above the TRV and EPA MCL for uranium at the monitoring well ring. Demonstrate that uranium concentrations at the monitoring well ring, or at the exemption boundary, would likely be below the TRV and protective of public health and safety.

### **MU – 3 Restoration Data Package**

1. Figure 5.8. The nitrate and nitrite concentration vs. restoration period appears to show significant increasing trends from the first round of stability monitoring to the fourth round of stability monitoring. Demonstrate that restoration success has been achieved for nitrate and nitrite and stability has been achieved by the absence of significant increasing trends.

### **MU – 4 Restoration Data Package**

1. Figure A-13. This figure appears to be missing data point 4T114-1, with a uranium value of uranium of 16.0 mg/l. Review this figure and indicate if it is correct as shown, or modify as necessary.
2. Figure 4-4. 4W104-1 is shown as a restoration well on this figure. However, data for this well is not reported in stability monitoring rounds 1 through 4. Please explain why 4W1-4-1 has no data reported.
3. Section 6.2.3 shows that using a post restoration wellfield average of 3.83 mg/l for uranium and a reduction factor of 6, uranium will be 0.830 mg/l which is above the target restoration value (TRV), or background, at 400 feet down gradient of the wellfield boundary, which is generally where the monitoring well ring is located. However, using the maximum uranium value of 16.0 mg/l of uranium from restoration well 4T114-1, this would likely be much higher and likely would be well above the TRV and the EPA MCL for uranium. Demonstrate that uranium concentrations at the monitoring well ring, or at

the exemption boundary, would likely be below the TRV and protective of public health and safety.

4. Figure A-13 shows uranium values of 7.84 mg/l, 6.17 mg/l and if well 4T114-1 is included, 16.0 mg/l, in a small area in the southern most portion of MU- 4. Demonstrate that for this portion of the mine unit that public health and safety is protected in down gradient of the mine unit.
5. The TRV for selenium is 0.01 mg/l. The stability round 4 restoration mean is 0.21 mg/l selenium, which is well above the TRV. Additionally, the highest stability round 4 restoration value is 0.512 mg/l in well 4U108-1. Demonstrate that public health and safety is protected in down gradient of mine unit 4 for selenium.

### **MU – 5 Restoration Data Package**

1. Section 4.6.2. One ore zone perimeter well MU5 (MW66) went on excursion status on July 21, 2004, one month before 4<sup>th</sup> stability monitoring sample. This well is directly down gradient of MOD 55 and has remained on excursion. COGEMA correspondence with WDEQ and the NRC, in the NRC ADAMS records and management system, indicates that WDEQ and NRC agreed that additional restoration or corrective action was not required at the time. Records also indicate that additional monitoring was performed on this well. Submit the additional full analysis (Guidance 8) monitoring data that was performed for this well or show where this information can be found.
2. For MW66, demonstrate that sampling taken for the full analysis of monitoring data has remained stable to date.
3. Demonstrate that levels of constituents remaining in MW66 will be protective of public health and safety down gradient of the MU-5 at the aquifer exemption boundary.
4. It appears the location of well 5BL76-1 is shown as 2.97 mg/l uranium on Figure A-12. In Table A-1, stability round 4, well 5BL76-1 is listed as 14.8 mg/l uranium. Confirm that this figure is correct or modify as necessary.
5. The uranium value at well 5BL76-1 is 14.8 mg/l after stability round 4. This is well above the statistical mean of 2.05 for the uranium post-restoration wellfield average. Demonstrate that for this portion of the mine unit that public health and safety is protected in down gradient of the mine unit at the aquifer exemption boundary.
6. The selenium values at wells MW-03 and MW-07, both very close together, exceed 1.0 mg/l which are well above the average of 0.41 mg/l and the TRV of 0.01. Demonstrate that for this portion of the mine unit that public health and safety is protected in down gradient of the mine unit at the aquifer exemption boundary.

**MU – 6 Restoration Data Package**

1. The uranium value at well 6m 29-1 is 9.28 mg/l after stability round 4. Demonstrate that for this portion of the mine unit that public health and safety is protected in down gradient of the mine unit at the aquifer exemption boundary.