

July 20, 2001

Mr. T. W. Hardgrove, Manager  
Environmental and Regulatory Services  
Pathfinder Mines Corporation  
935 Pendell Avenue  
P.O. Box 730  
Mills, Wyoming 82664

SUBJECT: REQUEST FOR ALTERNATE CONCENTRATION LIMITS FOR PATHFINDER  
SHIRLEY BASIN, WYOMING URANIUM MILL, LICENSE SUA-442

Dear Mr. Hardgrove:

On March 31, 2000, Pathfinder Mines Corporation (PMC) submitted an application for alternate concentration limits (ACL) for its Shirley Basin mill site to the U.S. Nuclear Regulatory Commission (NRC). NRC staff have reviewed the submittal which was prepared by Hydro-Engineering, LLC. Additionally, a staff groundwater reviewer made a site visit in June of 2001 to personally observe the areas described in the application and discuss the intent of your proposed actions.

The detailed ACL application is logically presented; however, the NRC is requesting additional information before a final review can be made. On the basis of the review and recent site visit, 12 action items have been identified which will require your attention in order for NRC to complete its review of the application. The action items are identified in the attached Request for Additional Information.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures 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 the Public Electronic Reading Room (<http://www.nrc.gov/NRC/ADAMS/index.html>).

If you have any questions regarding this letter, please contact Daniel Rom, PE, the NRC Project Manager for the Shirley Basin Mill, at (301) 415-6704.

Sincerely,

**/RA/**

Melvyn Leach, Chief  
Fuel Cycle Licensing Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Enclosure: Request for Additional Information  
Docket 40-6622, SUA-442

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SUBJECT: REQUEST FOR ALTERNATE CONCENTRATION LIMITS FOR PATHFINDER SHIRLEY  
BASIN, WYOMING URANIUM MILL, LICENSE SUA-442

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Enclosure: Request for Additional Information

Docket No. 40-6622, SUA-442

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<b>DATE</b>	07/19/01		07/19/01		07/20/01		07/20/01	

\*See previous concurrence

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**REQUEST FOR ADDITIONAL INFORMATION  
PATHFINDER MINES CORPORATION (PMC)  
SHIRLEY BASIN, WYOMING  
ALTERNATIVE CONCENTRATION LIMITS (ACLs) APPLICATION**

PMC is requested to submit, in writing to Melvyn Leach, Chief, Fuel Cycle Licensing Branch, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington D.C. 20555, by August 24, 2001, information regarding the following comments:

- 1) The Safe Drinking Water Act (SDWA) Maximum Concentration Limit (MCL) of 0.05 mg/L for Selenium does not supersede the 0.01 mg/L standard in 10 CFR Part 40, Appendix A, Criterion 5B(5)(b) Table 5C.

**Discussion:** The submittal states that the SDWA Maximum Concentration Limit (MCL) of 0.05 mg/L will replace the 0.01 mg/L standard in 10 CFR Part 40, Appendix A, Criterion 5B(5)(b). This is not allowable under the regulations per 10 CFR Part 40, Appendix A Criterion 5B(5). However, an ACL can be used for selenium as long as Criterion 5B(6) is satisfied.

**Action:** The licensee must use either the standard of 0.01 mg/L or an ACL for selenium.

- 2) For hazardous constituents which exceed the standard in the license, the licensee must either continue corrective action or propose ACLs.

**Discussion:** The report states that the standard for radium-226 and radium-228, and gross alpha are exceeded in some areas of groundwater. ACLs or further corrective action is needed for standards that are exceeded. Iso-concentration maps for these parameters and a table of historic concentrations is needed. Also, other parameters such as arsenic have been elevated above the standard at times and may also trigger corrective action in the future, therefore, PMC may want to evaluate these as potential ACLs. Per criterion 5D of 10 CFR Part 40, corrective action must be implemented if groundwater standards are exceeded.

**Action:** The licensee must provide information on whether it is continuing corrective action for these parameters or seeking additional ACLs.

- 3) Risk information regarding uranium toxicity is outdated and must be updated.

**Discussion:** A risk concentration 0.15 mg/L for uranium is given. In light of the new EPA MCL of 0.03 mg/L (Federal Register Vol. 65, No. 236 pages 76707-76753) and additional studies regarding the chemical toxicity of uranium, this should be re-visited. Section 2.3.2.1 and appendix A in the report need to be re-visited. Criterion 5B(6) of 10 CFR Part 40 states that it must be demonstrated that “the constituent will not pose a substantial present or potential hazard to human health or the environment.”

**Action:** Discussion of exposure to uranium via water ingestion must be revised to incorporate the most recent information presented by the EPA.

4) All site derived constituents must be evaluated for potential adverse affects on human health and the environment.

**Discussion:** For the purposes of environmental evaluation under the National Environmental Policy Act (NEPA), sulfate, chloride, and any other elevated parameters should be discussed regarding their risk to the human health or the environment. Iso-concentration maps and sample result tables are needed. The NRC is obligated under NEPA per 10 CFR Part 51.21 to complete an environmental assessment for this action.

**Action:** Risk to human health or the environment must be evaluated further for sulfate, chloride, nitrate, and total dissolved solids.

5) There needs to be sampling points at the point of exposure (POE) (Spring Creek) to assure that human health and the environment are protected over time.

**Discussion:** To assure that human health and the environment are protected as the contaminated groundwater migrates to the POE and discharges into Spring Creek, sampling points must be added as part of the environmental monitoring program. Criterion 5B(6) of 10 CFR Part 40 states that it must be demonstrated that “the constituent will not pose a substantial present or potential hazard to human health or the environment.”

**Action:** Sampling locations at the POE must be proposed.

6) A table showing model input parameters is needed.

**Discussion:** To properly evaluate the fate and transport model, the input parameters must be presented.

**Action:** Create a table with model input parameters.

- 7) Additional clarification is needed to support use of a lower uranium concentration in the fate and transport model rather than the actual concentration detected in the tailings wells.

**Discussion:** A value of 7.0 mg/L of uranium was used in the fate and transport model while the actual concentration in the tailings wells is 15 mg/L. This may not represent a worst case scenario for future migration of contaminated groundwater to the POE. Additional discussion and justification is needed in the ACL application.

**Action:** Further discussion is needed to support the uranium value used in the model.

- 8) It is unclear if contaminated groundwater is now migrating, or is projected in the future to migrate under Spring Creek.

**Discussion:** The full extent and severity of groundwater contamination must be defined in an ACL application per 10 CFR Part 40 Criterion 5B(6). The licensee has not demonstrated that groundwater contamination all discharges into Spring Creek during all flow conditions.

**Action:** It must be demonstrated that all groundwater contamination migrates into Spring Creek and that none migrates beneath the stream. If contamination flows beneath the stream further analysis is needed to show that this migration will not be a risk to human health or the environment and that the POE is located correctly.

- 9) The risk to aquatic organisms in Spring Creek must be evaluated from any site derived constituents.

**Discussion:** 10 CFR Part 40, Appendix A Criterion 5B(6) states that “the existing quality of surface water including other sources of contamination and the cumulative impacts on surface water quality” must be assessed under an ACL application.

**Action:** The report must be revised to evaluate the risk to the environment in surface water from all site derived constituents.

- 10) The proposed POE location is some distance down stream from the area where seepage constituents first migrate from the groundwater into the stream. The area where seepage into the stream from the groundwater contamination occurs should be designated as the POE since this is where potential exposure occurs. Stream sampling should occur at several points along the POE to monitor concentrations of constituents as a result of seepage and to assure that levels do not pose an exposure risk.

**Discussion:** To assure that human health and the environment are protected as the contaminated groundwater migrates to the POE and discharges into Spring Creek, sampling points must be added as part of the environmental monitoring program. Criterion 5B(6) of 10 CFR Part 40 states that it must be demonstrated that “the constituent will not pose a substantial present or potential hazard to human health or the environment.”

**Action:** The POE area and stream sampling program must be modified.

- 11) Post-pumping/injection monitoring is needed to measure rebound groundwater quality conditions and to assure that seepage into the stream does not pose an exposure risk.

**Discussion:** Criterion 5B(6) of 10 CFR Part 40 states that it must be demonstrated that “the constituent will not pose a substantial present or potential hazard to human health or the environment.” Once the groundwater pumping/injection system is turned off, a rebound in water quality will occur. It is imperative to monitor groundwater quality and water table levels immediately after the groundwater pumping/injection is ceased in order to verify that conditions mimic the model and to detect potential migration of higher than expected levels from exceeding the standards and creating an impact in Spring Creek.

**Action:** Propose a tapered groundwater monitoring system to measure post pumping groundwater quality conditions. Start at a higher frequency of sampling then decrease the frequency over time.

- 12) Private property is presently located within the proposed long-term care boundary in an area along Spring Creek. This potentially affects transfer to the DOE for long-term care and sets up potential exposure scenarios (potential groundwater use) within the long-term boundary.

**Discussion:** Criterion 5B(6) of 10 CFR Part 40 states that it must be demonstrated that “the constituent will not pose a substantial present or potential hazard to human health or the environment.” Private property within the long-term care boundary creates a potential for a property owner to install a water supply well and thereby create a potential exposure scenario via groundwater ingestion.

**Action:** In a recent site visit, the licensee stated that this land would be acquired. Evidence that the land is owned by the licensee and will be transferred to the DOE is needed.