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Executive Vice President

December 28, 1998

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The Honorable Dr. Shirley Jackson
Chairman
U.S. Nuclear Regulatory Commission
Two White Flint North
Rockville, Maryland 20852-2738

Re: **Source Material License SUA-917, Docket 40-3453**

Dear Madam Chairman:

We appreciate very much the time and attention you have given to Atlas Corporation's pending license amendment. In particular, we are pleased that you and Commissioner Merrifield made the time to visit our uranium mill and tailings site near Moab, Utah. Clearly, it is appropriate that your focus is on Atlas' ability to remediate the site, not just in terms of the surface reclamation, but also on the groundwater cleanup. While we had the opportunity to discuss groundwater related issues during your visit, there were some things I was not fully prepared to discuss in detail without further review with our technical consultants. The purpose of this letter is to follow up with more detailed information on groundwater cleanup which, we hope, results in a greater degree of confidence by you and the other commissioners that, 1) groundwater cleanup is technologically feasible, and, 2) that Atlas and its contractors have the capability of implementing the groundwater cleanup with the pile being capped in place.

Since meeting with you and Commissioner Merrifield on December 17, 1998, I have consulted with Harding Lawson Associates (HLA), our technical consultants, for an updated report on the status of their efforts regarding the groundwater corrective action plan (GWCAP). Presented herein is a summary review of the status of the evaluation of alternatives for the GWCAP, as well as a brief, but pertinent, review of the background for this issue.

Background

The 1979 Final Environmental Statement not only states approval for capping the pile in place, it also acknowledges the existence of contaminated seepage from the tailings pile to the shallow groundwater and eventually to the Colorado River. Recognition in that earlier environmental analysis of a small quantity of seepage from the pile indicates that this is not a new issue. The only new finding related to this issue is that ammonia is the contaminant of concern; and that

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because it may present a threat to an individual member of an endangered species of fish in the Colorado River.

In 1987 Atlas Corporation contracted with an independent third party for the evaluation of the groundwater monitoring program at the Atlas uranium mill and tailing site. A report of that evaluation was submitted to NRC in February 1988 and additional information was provided April 15, 1988. Then in March 1989, Atlas submitted a GWCAP that was subsequently amended in June 1989. These studies presented by Atlas in conjunction with the independent analysis by NRC staff resulted in the NRC approved GWCAP that was implemented in 1990 and is still in operation today. Atlas submits an annual report on the amount of contaminants and liquid removed from the tailings pile as a result of this continuing tailings dewatering program.

The 1989 GWCAP proposal documents the independent consultant's assessment of a number of alternatives that include dewatering, barrier wall, bottom seal, pump and treat methods, and removal to an alternate site. This study's conclusions include the following points:

- Institutional controls will preclude public use of the groundwater in perpetuity.
- Health risk at the point of exposure is negligible.
- As the groundwater regime returns to pre-mill conditions, the water quality will change to a natural brine, with recharge flushing from the Colorado River only. The brine will cause the groundwater to be unfit for consumption or use.

The brine/fresh-water interface is approximately seventy feet below ground surface near the tailings pile. The brine contains salt (total dissolved solids/TDS) at concentrations in excess of 100,000 milligrams per liter (mg/l).

The GWCAP currently being implemented by Atlas was based on the conclusion by NRC staff that existing groundwater contamination was not amenable to active remediation. If groundwater remediation is determined to be practicable, as a result of revisiting the GWCAP, then resulting environmental impact to the Colorado River will be less than that already identified in the draft EIS. (NUREG - 1532, p. A-35, 1997)

We recognize that the previous analyses are now nearly ten years old and that more effort is now required to determine what the final groundwater corrective action plan should be to sufficiently remediate the groundwater at the site. Although NRC considers revisiting the GWCAP as a separate licensing action due to groundwater cleanup strategies and methodologies being contingent on the decision for surface reclamation of the tailings, Atlas has been working toward a revised GWCAP with the technical assistance of Harding Lawson Associates (HLA), the independent consultant. As we proceed to completion of the GWCAP, we must emphasize the following points:

- There is a large underground reservoir of brine relatively near the surface, and this brine is unusable. Further, as the saturated mound of tailings liquor decreases over time, the brine will likely seek a higher level resulting in increased TDS concentrations in the shallow alluvial groundwater. This condition has been observed on the east side of the river in the wetlands.
- Experience from past attempts to use the shallow groundwater as a water source upgradient from the mill site indicates that it is unusable as reliable water source.
- Since the groundwater flow is to the river from either side of the river, any contaminated groundwater from the site will not be available or accessible to downstream users, nor will the groundwater from the site flow to the other side of the river.
- There are no concentrations of radionuclides, metals or other constituents that present a threat to human health and safety in the river, even though uranium and molybdenum are slightly elevated in the mixing zone (point of exposure).
- The mixing zone, as identified by HLA after the sampling program in December 1997, is limited to approximately fifty feet from the shoreline, or about five percent of the river's width.
- Ammonia has been identified as the constituent of concern due to the potential threat to an individual fish of an endangered species. This potential threat only exists at periods of low flow in the river. At higher flows we have been unable to detect ammonia.

From a design basis, both the dewatering necessary to consolidate the tailings prior to placing the radon/precipitation barrier, as well as the barrier itself, are legitimate components of the GWCAP. These actions will result in benefit to groundwater remediation by reducing the amount of contamination that will ultimately be released to the groundwater and surface water systems. The relatively impermeable barrier, or cap, will preclude or minimize the infiltration of precipitation resulting in a significantly reduced seepage rate for the long-term. Nevertheless, we acknowledge the need to determine what might be done to reduce the ammonia concentrations between the tailings and the river. Investigating and evaluating a variety of technologies that could be implemented at our site is the current priority of Atlas and HLA.

Status Review of Groundwater Remediation Alternatives

While dewatering of the pile in order to accelerate consolidation of the pile was a highly probable action related to the surface reclamation plan, the Section 7 consultation process between NRC, Atlas and the U.S. Fish and Wildlife Service solidified dewatering as a necessary action. Consequently, the surface reclamation plan for the Atlas tailings pile has been enhanced to include the dewatering to accelerate consolidation of the tailings and to reduce future seepage from the tailings pile into underlying groundwater. Although tailings dewatering and the placement of the design cover will improve groundwater quality directly beneath and downgradient of the tailings pile, it is anticipated that the effects of these improvements will not be realized in reduced discharges to the Colorado River for a number of years. This is also true if the pile were to be moved. As a result, three alternatives are currently being considered for the

cleanup of groundwater discharging to the Colorado River downgradient of the tailings pile. These alternatives are: 1) passive groundwater treatment with a permeable reactive wall, 2) extraction and treatment of groundwater contaminated with ammonia using an extraction trench, and 3) extraction and treatment of groundwater contaminated with ammonia, uranium, and other contaminants using an extraction trench. The second alternative includes treatment of extracted groundwater using an enhanced evaporation system with disposal of solid residues onsite in a waste disposal cell. The third alternative includes treatment of extracted groundwater using reverse osmosis equipment with disposal of solid residues onsite in a waste disposal cell. Atlas assumes that NRC will approve alternate concentration limits (ACLs) for application of the first two alternatives. ACLs are optional for the third alternative but will affect the final cost. A summary of each of these alternatives is provided below:

1. Passive Groundwater Treatment for Ammonia using a Permeable Reactive Wall

This alternative consists of the construction of a permeable reactive wall into the aquifer downgradient of the tailings pile to intercept and treat groundwater flowing toward the Colorado River. The reactive wall would be constructed to a depth of 30 to 40 feet and extending for a length of 2100 feet (the approximate width of the ammonia plume discharging to the Colorado River). The reactive wall would be constructed of zeolitic reactive media that would provide anion exchange sites for ammonia and other anions (e.g., sodium, potassium, and calcium). As a result, ammonia concentrations would be reduced as groundwater flows through the reactive wall. While we assume that the zeolitic reactive media would require periodic replacement as anion exchange sites are used and the resulting effectiveness of the reactive media is reduced, at this time there is insufficient data to specify the period, with a high degree of confidence. Given the travel times from the tailings pile to the proposed location of the reactive wall, it is assumed that the permeable reactive wall would need to be maintained for a period of approximately 10 years. This technology is considered experimental for insitu applications such as the subsurface treatment of groundwater with little performance or cost data available. Consequently, laboratory testing and field scale pilot testing would be required to collect the data necessary to design and construct a full scale system. The preliminary cost estimate is in the range of $3 to $4 million.

2. Groundwater Extraction and Treatment for Ammonia

This alternative consists of the construction of a groundwater extraction trench into the aquifer downgradient of the tailings pile to intercept and treat ammonia contaminated groundwater flowing toward the Colorado River. The extraction trench would be constructed to a depth of 30 to 40 feet and extend for a length of approximately 2100 feet (the approximate width of the ammonia plume discharging to the Colorado River). The extraction trench would be filled with coarse gravel and would also contain an impermeable liner on the side adjacent to the Colorado River. This impermeable liner will serve to minimize the inflow of water from the Colorado River resulting from groundwater extraction. Similarly, groundwater extraction rates will be minimized to reduce upconing of the naturally occurring brines located just below the shallow alluvial groundwater. It is anticipated that the groundwater extraction trench would operate at flow rates of approximately 40 gallons per minute. Given the travel times from the tailings pile to the proposed location of the extraction trench, it is assumed that the extraction trench and evaporation pond would need to be operated and maintained for a period of at least 10 years.

Extracted groundwater would be evaporated in a seven acre pond equipped with pumps and spray nozzles to enhance evaporation rates. Solid residues remaining would be collected and deposited in a small waste disposal cell constructed directly adjacent to the existing tailings pile. This alternative utilizes technologies that are proven and widely used at a number of uranium mill tailings sites. The preliminary cost estimate is in the range of $6 to $8 million.

3. Groundwater Extraction and Treatment for Ammonia and Other Contaminants

This alternative consists of the construction of two groundwater extraction trenches into the shallow alluvial groundwater layer downgradient of the tailings pile and the former mill site to intercept and treat ammonia, uranium, and other contaminants in groundwater flowing toward the Colorado River. These other contaminants include vanadium, molybdenum, and various dissolved cations and anions. At this time the need for remediation of contaminants other than ammonia is uncertain. However in the event that the State of Utah demand to exercise their regulatory authority and if they refuse to accept ACLs, groundwater remediation of these other contaminants may be required and is being considered. Consequently, this alternative considers the construction of two extraction trenches. The first extraction trench would be constructed downgradient of the tailings pile to a depth of 30 to 40 feet and extending a length of 2100 feet (the approximate width of the contaminant plume downgradient of the tailings pile). The second extraction trench would be constructed downgradient of the former mill site to a similar depth and extending a length of 1400 feet (the approximate width of the contaminant plume downgradient of the mill site). Both extraction trenches would be constructed in a manner consistent with that described for the previous alternative. Again, as with the previous alternative, groundwater extraction rates will be minimized to reduce upconing of naturally occurring brines. It is anticipated that the groundwater extraction trenches would operate at a combined flow rate of approximately 80 gallons per minute. Given the low mobility of some of the other contaminants listed above, it is assumed that the extraction trenches and evaporation pond would need to be operated and maintained for a period of approximately 30 years. Extracted groundwater would be treated using reverse osmosis equipment with effluent waters discharged to the Colorado River. Solid residues remaining after filter pressing would be deposited in a small waste disposal cell constructed directly adjacent to the existing tailings pile. This alternative utilizes technologies that are proven and widely used at a number of uranium mill tailings sites. The preliminary cost estimate is in the range of $20 to $25 million.

Summary

From Atlas' perspective, considering the background presented above, particularly given the site-specific conditions, the potential application of alternate concentration limits (ACLs) at this site is a an option that must be considered. Also, we are evaluating the possible application of supplemental standards as defined under the Title I program that are available to the Department of Energy at its uranium mill tailings sites. We believe this option is available to

Atlas under the existing law and regulations so long as we can demonstrate that such alternative will not endanger life or property or the common defense and security and is otherwise in the public interest. The bottom line in this instance is that ammonia, as the potential threat to an individual of an endangered fish species, might be used to justify the

relocation of this pile at the cost of hundreds of millions of dollars and the viability of a company that has demonstrated its patriotic loyalty, its commitment to its legal obligations, and its willingness to continue to find a cooperative means to resolve this issue in a technically sound and cost-effective manner.

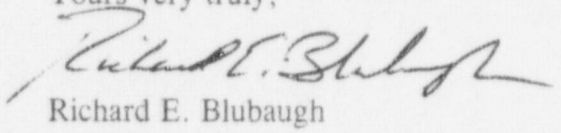
It is clear in our minds that in the long-term, with dewatering and capping, concentrations of ammonia and the other constituents will continue to decline as they have been. We are still studying the treatment alternatives and waiting for the final decision on surface reclamation. With respect to the groundwater treatment alternatives, we are not yet able to say which alternative will be best for this site. However, as far as the long-term reduction of ammonia concentrations, any plan to move the pile will have to deal with the same issue. Unfortunately, in that event, such remedial actions will most likely be years away due to legal and legislative (including funding) details, and even more study.

It is important here to reiterate a cogent point concerning the benefits of Atlas' proposal. Dewatering and capping will yield benefits to human health and the environment in both the short term and the long term. It will be disappointing indeed if the federal government opts to ignore the short term benefits of Atlas' surface reclamation plan even if it decides to move the pile in the long term.

We hope this gives you the additional information necessary to complete your evaluation and decision process. If you have any further questions, please call or have Mike Weber contact us or our counsel, Tony Thompson with Shaw Pittman Potts & Trowbridge. Tony can be reached at (202) 663-9198.

Your visit to our site and the attention you have given to Atlas' situation is very much appreciated. We look forward to a prompt resolution of the pending surface reclamation issue. Best wished for health and prosperity in the new year.

Yours very truly,



Richard E. Blubaugh

cc: The Honorable Commissioner Jeffrey S. Merrifield
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