

Docket File # 40-0299
LFMB/DCS/PDR
DBangart, RIV
DJacoby
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JHaes, RCPD, WY
LLW Branch, WMLU
URFO r/f

40-0299/DLJ/87/09/17/1

- 1 -

OCT 07 1987

URFO:DLJ
Docket No. 40-0299
SUA-648, Amendment No. 1
04000299020R

Umetco Minerals Corporation
P.O. Box 151
Riverton, Wyoming 82501

Gentlemen:

Our office has reviewed your June 3, 1987 request to amend Source Material License SUA-648 to authorize the disposal of Title I tailings and other contaminated materials (residual radioactive materials) from the former Susquehanna Western Mill (Riverton) into the A-9 pit and the subsequent reclamation of the A-9 disposal area. The staff review of your initial reclamation design resulted in a series of documents which were compiled by you into a final design package dated September 10, 1987, with revisions dated September 16, 1987. This final design was reviewed by my staff for conformance with Appendix A to 10 CFR 40 which establishes the technical, financial, ownership, and long-term site surveillance criteria relating to the siting, operation, decontamination, decommissioning and reclamation of uranium milling facilities. It was determined that the reclamation design met the required criteria.

Based on statements made in your application, as confirmed by discussions with your Mr. Lyons, our understanding is that you do not intend to use the A-9 pit for any future tailings discharge from the Umetco mill. This is obviously precluded by receiving and disposing of Riverton residual radioactive material and would not be your intent even if Riverton materials were not placed in the A-9 pit. Accordingly, during staff review of this licensing action, several license conditions were identified that related to the A-9 pit. These license conditions dealt with disposal of contaminated materials, discharge of liquid effluents to the A-9 pit, tailings discharge line instrumentation and ponded water elevation restrictions for the A-9 pit. The staff has determined that these license conditions either completely or in part discuss active utilization of the A-9 pit for tailings slurry discharge. Due to this situation being precluded by the authorization to dispose of the Riverton

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tailings, the staff modified or deleted these license conditions as appropriate.

Therefore, the staff recommends that Source Material License SUA-648 be amended by revising License Conditions Nos. 24, 26, 52, 53 and 55, by deleting License Conditions Nos. 44, 46, and 47, and by adding a new condition 58 as indicated below:

- 24. The licensee shall, by January 1, 1988, submit in the form of an amendment application an alternative disposal site for the contaminated mill wastes as described in their letter dated March 14, 1986.
- 26. All liquid effluents from the mill process building, with the exception of sanitary wastes, shall be returned to the mill circuit or the evaporation ponds.
- 44. DELETED by Amendment No. 1.
- 46. DELETED by Amendment No. 1.
- 47. DELETED by Amendment No. 1.
- 52. The licensee shall implement the inspection and monitoring program for the tailings disposal system (including the evaporation ponds) as specified in Regulatory Guide 3.11.1. A copy of the technical evaluation specified in Section C of Regulatory Guide 3.11.1 covering the evaporation ponds shall be submitted to the USNRC within one month of completion of the evaluation.
- 53. The licensee shall submit, by March 31, 1988, in the form of an amendment application a detailed reclamation plan to stabilize and reclaim the heap leaches, evaporation ponds and ancillary facilities.
- 55. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, for reclamation of any tailings or waste disposal areas, ground water restoration as warranted and the long-term surveillance fee. Within three (3) months of NRC approval of a revised reclamation/decommissioning plan, the

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licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within three (3) months of written NRC approval. Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC at least three (3) months prior to the anniversary of the effective date of the existing surety instrument. If the NRC has not approved a proposed revision to the surety coverage 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing surety arrangement for 1 year. Financial surety coverage for the full amount of the NRC approved reclamation/decommissioning cost estimate shall not lapse for any time period prior to license termination.

Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a 15 percent contingency fee, changes in engineering plans, activities performed and any other conditions affecting estimated costs for site closure. The licensee shall also submit to the NRC, all surety related correspondence provided to the State, a copy of the State's surety review and the final approved surety arrangement. The licensee shall also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC portion of the surety and covers the decommissioning and decontamination of the mill and mill site, reclamation of the tailings and waste disposal areas, ground water restoration as warranted and the transfer of the long-term surveillance fee to the U.S. General Treasury. The basis for the cost estimate is the NRC approved reclamation/decommissioning plan or NRC approved revisions to the plan. Reductions in the estimate based on work accomplished or changes to the plan shall not be made without prior NRC approval.

Umetco Gas Hill's currently approved surety instrument, a surety bond with Seaboard Surety Company (No. 861822 for \$5,876,703) in favor of the State of Wyoming, shall be continuously maintained for the purpose of complying with 10 CFR 40, Appendix A, Criteria 9 and 10 until a replacement is

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authorized by both the State and NRC. This bond must be increased using a rider (as prescribed by State requirements), replaced or supplemented with another acceptable instrument by January 1, 1988, to include the total NRC approved reclamation/decommissioning estimate. The approved estimate currently totals \$10,566,000.

Attachment 5 outlines the minimum considerations used by the NRC in the review of decommissioning and reclamation estimates. Licensee submittals of reclamation/decommissioning plans should follow this guidance.

- 58. The licensee is authorized to receive and dispose of 1,750,000 cubic yards of wastes from the Riverton processing site in the A-9 pit and reclaim in accordance with submittals dated September 10 and 16, 1987. Additionally, the licensee shall:
 - A. Prior to placement of the final cover, verify that the interim cover is compacted to 95 percent of Proctor maximum density.
 - B. Place the final cover clay and filter layers in compacted lift thicknesses not exceeding six (6) inches.
 - C. Place the spoil layer in a loose-lift thickness not to exceed eighteen (18) inches.
 - D. Assure that the riprap layer thickness is greater than 1.5 times the upper-limit D₅₀ size, or the maximum D₁₀₀ size, whichever is larger.
 - E. Submit proposed filter bed and riprap gradation requirements for USNRC review and approval three (3) months prior to placement, but in any case no later than October 1, 1988.

All other conditions of this license shall remain the same. The license is being reissued in its entirety to incorporate the revisions specified above.

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The issuance of this amendment was discussed and agreed upon via telephone conversation between Mr. Lyons and Ms. Jacoby of my staff on September 30, 1987.

FOR THE NUCLEAR REGULATORY COMMISSION

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R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

Enclosure: Source Material License SUA-648

Case Closed: 04000299020R

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NAME	: DJacoby	: RGonzales	: DGrace	: ARose	: EHawkins	: RDSmith
DATE	: 87/10/06	: 10/06/87	: 10/6/87	: 10/6/87	: 10/6/87	: 10/6/87

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee

<p>1. Umetco Minerals Corporation</p> <p>2. P.O. Box 151 Riverton, Wyoming 82501</p>	<p>3. License number SUA-648, Amendment No. 1</p> <p>4. Expiration date June 30, 1992</p> <p>5. Docket or Reference No. 40-0299</p>
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Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
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6. Natural Uranium	7. Any	8. Unlimited
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9. Authorized place of use: The licensee's uranium milling and heap leach facilities located in Natrona County, Wyoming.

10. For use in accordance with statements, representations, and conditions contained in Sections 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5, 5.3 and 6.0 of the renewal application dated December 30, 1985 except where superseded by license conditions listed below.

Whenever the word "will" is used in the above referenced sections it shall denote a requirement.

- 11. The mill production per calendar year shall not exceed 551 tons of U₃O₈.
- 12. Any changes in the mill circuit as illustrated and described in Figure 3.2 of the renewal application dated December 30, 1985 shall require approval by the U.S. Nuclear Regulatory Commission in the form of a license amendment.
- 13. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the mill, provided that all entrances to the mill are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "Any area within this mill may contain radioactive material."
- 14. The RSO shall meet the minimum qualifications specified in Section 2.4.1 of Regulatory Guide 8.31 dated May 1983.
- 15. Standard written operating procedures (SOP's) shall be established for all operational process activities involving radioactive materials that are handled, processed, or stored. Standard operating procedures for operational activities

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shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses, and instrument calibrations. An up-to-date copy of each written procedure shall be kept in the mill area to which it applies.

All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the RSO before implementation and whenever a change in procedure is proposed to ensure that proper radiation protection principles are being applied. In addition, the RSO shall perform a documented review of all existing operating procedures at least annually.

16. When the mill is operating, the RSO shall prepare and submit a monthly radiation safety report to the General Superintendent; when operations are suspended, this report shall be quarterly. This report shall summarize personnel exposures, bioassay results, RWPs, inspections, monitoring and survey results. In addition, the monthly report shall include a review of trends in personnel exposures or area radiation exposure rate levels and shall specifically address any unresolved safety problems and provide proposed corrective action.
17. The licensee shall conduct the annual ALARA audit program as proposed in their renewal application dated December 30, 1985. A copy of the ALARA audit report shall be sent to the Uranium Recovery Field Office within 30 days of completion of the audit.
18. Operations shall be immediately suspended in the affected area of the mill if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications.

To ensure proper operation, the scrubber system on the concentrate dryer and packaging area should be checked in accordance with Criterion 8 of Appendix A of 10 CFR 40 unless instrumentation is installed which signals an audible alarm if either water flow or differential pressure fall below the manufacturer's recommended levels. Operation of the audible alarm shall be tested and documented daily.

19. Occupational exposure calculations shall be documented within 1 week of the end of each regulatory compliance period as specified in 10 CFR 20.103(a)(2) and 10 CFR 20.103(b)(2). Nonroutine ore dust and yellowcake samples shall be analyzed and the results reviewed by the RSO or his designate within 2 working days after receipt of the analytical results by the RSO or his designee.
20. Calibration of all equipment utilized for area radiation surveys and for internal exposure determinations shall be performed in accordance with Section 7 of Regulatory Guide 8.30 dated June 1983.

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21. In addition to the bioassay program described in Section 4.4.2.4 of the license renewal application, the licensee shall comply with the following:
 - A. Anytime an action level of 15 ug/l uranium for urinalysis or 9 nCi of natural uranium for in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22, dated January 1987. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, as part of the semiannual report required by 10 CFR 40.65.
 - B. Anytime an action level of 35 ug/l for two consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22. This documentation shall be submitted to the NRC, Uranium Recovery Field Office, within thirty (30) days of exceeding the action level.
22. Release of equipment or packages from the restricted area shall be in accordance with Attachment No. 1 to the license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials" dated September 1984.
23. Mill tailings other than samples for research shall not be transferred from the site without specific prior approval of the USNRC in the form of a license amendment. The licensee shall maintain a permanent record of all transfers made under the provisions of this condition.
24. The licensee shall, by January 1, 1988, submit in the form of an amendment application an alternative disposal site for the contaminated mill wastes as described in their letter dated March 14, 1986.
25. The licensee is hereby authorized to possess byproduct material in the form of uranium waste tailings generated by the licensee's uranium recovery operations authorized under SUA-648.
26. All liquid effluents from the mill process building, with the exception of sanitary wastes, shall be returned to the mill circuit or the evaporation ponds.
27. The results of sampling, analyses, surveys and monitoring, the results of calibration of equipment, reports on audits and inspections, and all meetings and training courses required by this license and any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in USNRC regulations, all such documentation shall be maintained for a period of at least 5 years.

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- 28. The licensee shall immediately notify the USNRC, Uranium Recovery Field Office, by telephone and telegraph, of any failure to the tailings dam, tailings discharge or solution return system which results in a release of radioactive material and/or any unusual conditions which if not corrected could lead to such a failure. This requirement is in addition to the requirements of 10 CFR Part 20.
- 29. The licensee shall conduct fire drills at least annually at the mill. Fire detection systems shall be checked weekly for alarm indication and fire extinguishers shall be checked monthly to determine that they are fully charged and operable.
- 30. The licensee shall submit a detailed decommissioning plan to the USNRC at least twelve (12) months prior to final shutdown of milling operations.
- 31. Before engaging in any activity not previously evaluated by the USNRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not assessed or that is greater than assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval from the USNRC in the form of a license amendment.
- 32. The licensee shall conduct an annual survey of land use (private residences, grazing areas, private and public potable water and agricultural wells, and non residential structures and uses) in the area within five (5) miles (8 km) of any portion of the restricted area boundary and submit a report of this survey to the USNRC, Uranium Recovery Field Office. This report shall indicate any differences in land use from that described in the last report.
- 33. In order to ensure that no disturbance of cultural resources occurs in the future, the licensee shall have an archeological and historical artifact survey of areas of its property, not previously surveyed, performed prior to their disturbance, including borrow areas to be used for reclamation cover. These surveys must be submitted to the USNRC and no such disturbance shall occur until the licensee has received authorization from the USNRC to proceed.

In addition, all work in the immediate vicinity of any buried cultural deposits unearthed during the disturbance of land shall cease until approval to proceed has been granted by the USNRC.

- 34. The licensee shall conduct the groundwater monitoring program summarized in Table 6.9 of the FES (NUREG-0702) with the following modifications:

Air particulate monitoring is not required at the bunk houses unless they are utilized.

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TLDs located at the air particulate monitoring stations shall be exchanged quarterly.

Only dissolved parameters shall be determined for water sample analyses.

Monitor Well 8 does not need to be sampled.

Monitor Well 21 shall be sampled in lieu of drilling a new Monitor Well 35.

Monitor Well 37 shall be deleted.

Manganese, cyanide and vanadium can be deleted from the chemical monitoring program

In addition, potentiometric measurements shall be made before actual groundwater sampling and at the same frequency as for monitor well samples.

Notwithstanding the information given in Figure 6.2 and Table 6.9 of the FES (NUREG-0702), the proposed monitor well labels, as listed in the table entitled, "Locations and Specification for Monitor Wells," submitted by the March 25, 1981, shall be used.

- 35. The licensee shall implement a ground water detection monitoring program to ensure compliance to 40 CRF 192.32(a)(2) which includes the following elements:
 - A. The licensee shall monitor at the point of compliance and background wells for the following indicator parameters: Arsenic, Selenium and pH. The licensee shall utilize analytical techniques capable of providing lower limits of detection of 0.005 mg/l and 0.001 mg/l for arsenic and selenium, respectively. Measurements of pH shall be reported to the nearest 1/10 standard unit.
 - B. The determination of compliance shall be based on sampling Well MW-1 for the inactive tailings area and Wells GW-7 and GW-8 for the A-9 pit.
 - C. The determination of background levels for the parameters specified in subsection (a) shall be defined by sampling Wells PW-5 and EPW-3 for the A-9 pit and using historical data from Well MW-2 for the inactive tailings area.
 - D. The licensee shall sample for those parameters specified in subsection (a) at those wells designated in subsections (b) and (c) on a monthly basis for a period one (1) year and at least twice annually thereafter. The first monthly sample shall be collected within 30 days of the effectiveness of this condition. All semiannual samples shall be taken at least four months apart.

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- E. The licensee shall, within 60 days of collection of the last of the twelve monthly samples, propose for USNRC review and approval in the form of a license amendment background levels for indicator parameters and a statistical procedure for identifying significant changes (95% confidence level) between data from the wells specified in subsections (b) and (c).
 - F. The licensee shall report the data required above semiannually in accordance with the reporting format, Attachment No. 2 to SUA-648, "Detection Monitoring Data Report." These monitoring requirements are in addition to the requirements specified in other conditions of this license.
 - G. The licensee shall report at least annually, in accordance with reporting requirements specified in subsection (f) above, the rate and direction of ground water flow under the tailings impoundment.
36. The licensee shall minimize, to the maximum extent practicable, ponding of water in the A-9 pit through decanting and the use of spray evaporation systems. Approval of spray evaporation techniques for any areas, except the A-9 pit and the adjacent evaporation ponds, shall require approval from the USNRC in the form of a license amendment.

Additionally, the licensee shall prevent precipitation runoff from entering the A-9 Pit, to the maximum extent practicable, in accordance with their plan submitted by letter dated March 16, 1987. The necessary construction shall be completed by December 31, 1987, and the system shall be inspected as part of the inspection program required for the evaporation ponds in order to assure that the runoff diversion system is maintained and functions as designed.

- 37. The licensee shall minimize blowing of ore piles, tailings and heap leach piles by water sprinkling, spraying or other suppression techniques unless a documented weekly inspection indicates that natural conditions are controlling dusting. This program shall include the use of written operating procedures specifying the use of control methods.
- 38. The licensee shall follow the lower limits of detection contained in Attachment No. 3, "Lower Limits of Detection for Sample Analysis" for the analysis of samples collected in conjunction with the environmental monitoring program.
- 39. The results of all effluent and environmental monitoring required by this license shall be reported in accordance with 10 CFR 40, Section 40.65, with copies of the report sent directly to the USNRC, Uranium Recovery Field Office. Monitoring Data shall be reported in the format shown in Attachment No. 4 to this license entitled, "Sample Format for Reporting Monitoring Data."
- 40. The leak detection system associated with the buried solution return line from the South evaporation pond to the mill shall be inspected as follows during mill operation:

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- A. The location of standpipes shall be as shown on Map No. A12-81-27B submitted by letter dated July 9, 1984. All standpipes with the exception of standpipes 11, 12, 14 and 15, shall be checked monthly for the presence of seepage during operations. All such checks shall be documented.
 - B. The electrical leak detection system shall be checked weekly during operations to assure it is functioning as designed and the checks documented.
 - C. A surface line shall be maintained between standpipes No. 10 and 16. The surface line shall be inspected twice per shift during operations and the inspections documented. Future plans for burial of the line between standpipes No. 10 and 16 shall be submitted to the Uranium Recovery Field Office, USNRC, for review and approval prior to implementation.
41. Operation and maintenance of the uranium heap leach at the East Gas Hills mill site shall be in accordance with the following documents and conditions:
- A. "Proposed Heap Leach Program East Gas Hills, Revision 2, dated April 12, 1978."
 - B. Letter dated May 13, 1982 enclosing "Memorandum-Extension to the East Gas Hills Heap Leach."
 - C. The licensee shall obtain specific approval from the USNRC in the form of a license amendment prior to construction of any additional heap leach piles beyond a total of 1400 MSDT.
 - D. The licensee shall make at least one documented inspection per day of the heap leach area, when it is operating, to determine if operations are being conducted in accordance with written procedures.
42. The licensee shall not dispose of solid or liquid wastes in the above-grade tailings impoundment. In addition:
- A. Eight piezometer wells shall be maintained to monitor the phreatic water line in the tailings dikes. The piezometer measurements shall be made semiannually. Piezometer measurements can be discontinued for wells after there have been at least two (2) consecutive dry readings from that well.
 - B. The licensee shall maintain an automatic high liquid level alarm in the west berm sump.
 - C. The licensee shall operate the inactive tailings impoundment surface water seepage collection system and perform monitoring in accordance with the plan described in Union Carbide Corporation's letter dated April 23, 1981, with the exception that collection of water from the sumps shall be in accordance

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with the submittal dated December 5, 1983. The licensee shall document the results of the monitoring of the seepage collection system. The licensee shall also perform a daily documented inspection of the sumps and shall record the water levels daily.

- D. The licensee shall implement the berm sump monitoring program as specified in their submittal dated December 5, 1983 with the following exceptions:
- 1) The action level for Sump No. 4 shall be 4.0 feet.
 - 2) Collection of water from the sumps shall be documented.
43. Operation and maintenance of the below-grade tailings disposal system in the A-9 pit shall be in accordance with the the following documents and conditions:
- A. Sections 3-9 and 11 of "Alternative VII - Inplace Dewatered Uranium Tailings Disposal System," September 28, 1979, submitted by letter dated September 18, 1979.
 - B. The licensee shall maintain three additional piezometers at each of two locations in the tailings in the below-grade impoundment; at a station approximately halfway between the north and south ends of the center line drainage blanket, and at a station near the south end of this drainage blanket. These piezometers shall be placed at distances of 50, 100, and 200 feet from the drainage pipe. At one station, the piezometers should be placed to the west of the drain and at the other station they should be placed to the east of the drain. Piezometer readings shall be taken at quarterly intervals and submitted at least semianually as part of the environmental monitoring report required by 10 CFR 40.65.
4. DELETED by Amendment No. 1.
45. The licensee shall maintain cumulative flow meters on all lines leaving the A-9 pit and shall document weekly the total flow of liquid pumped or decanted from the A-9 pit.
46. DELETED by Amendment No. 1.
47. DELETED by Amendment No. 1.
48. Maintenance and operation of the evaporation ponds shall be conducted in accordance with Section 6 and Exhibit 2 of "Alternative VII - Inplace Dewatered Uranium Tailings Disposal System," dated September 28, 1979.

Additionally, the exposed clay liner of the evaporation ponds at and below the maximum operating level of the pond shall be kept moist at all times to prevent desiccation and cracking.

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49. The licensee shall maintain at least five (5) feet of freeboard between the embankment crest of the evaporation ponds and the maximum operating level of the ponded liquid.
50. As a precaution against settlement, the top of the clay liner of the embankment of the evaporation ponds shall be maintained at two feet above the maximum operating level in the south evaporation pond and one foot above the maximum operating level in the north evaporation pond.
51. The licensee shall maintain erosion controls at tailings liquid inflow points into both evaporation ponds and at the culvert outlet into the north pond.
52. The licensee shall implement the inspection and monitoring program for the tailings disposal system (including the evaporation ponds) as specified in Regulatory Guide 3.11.1. A copy of the technical evaluation specified in Section C of Regulatory Guide 3.11.1 covering the evaporation ponds shall be submitted to the USNRC within one month of completion of the evaluation.
53. The licensee shall submit, by March 31, 1988, in the form of an amendment application a detailed reclamation plan to stabilize and reclaim the heap leaches, evaporation ponds and ancillary facilities.
54. The final reclamation of the inactive, above-grade tailings areas and heap leach site shall be in accordance with the December 18, 1980 letter enclosing the D'Appolonia Consulting Engineers report entitled, "Reclamation Plan - Inactive Tailings Areas and Heap Leach Site," and the April 19, 1979 and May 13, 1982 letters.

Notwithstanding, the following modifications shall be required in lieu of statements made in the above referenced documents:

- A. The alternate reclamation plan which provides for 10H:1V embankment slopes as presented in Section 4.1 of the D'Appolonia report shall be required.
- B. The entire reclaimed tailings and heap leach areas shall be covered with a minimum of ten (10) feet of cover material which meets the following requirements:
 - 1) A clay cap of a minimum of 1 foot thickness.
 - 2) A suitable filter material of a minimum 1 foot thickness to be placed directly over the clay cap. The licensee shall document and submit to the USNRC the soils testing data for the filter materials which demonstrates a permeability differential of at least two orders of magnitude greater than the clay cap materials.

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- 3) A minimum of 7.5 feet of additional overburden and spoils materials. The licensee may use a thickness of 6.5 feet over areas specified to be covered by cobble rock riprap.
- 4) A minimum of 0.5 feet of topsoil.
- 5) A minimum of 1.5 feet of cobble rock riprap on slopes greater than 10H:1V over reclaimed areas. The rock riprap shall have the following gradation as a minimum.

% Passing by Weight Rock Size (inches)

100	8 - 12
50	6 - 8
15	3 - 4

- C. The licensee shall not rip the topsoil into the spoils materials as proposed in the reclamation plan.
- D. Prior to completion of reclamation, the licensee shall assure that the water retention structure adjacent to the spoils area, lying east of the above ground impoundment, has been removed and drainage re-established.
- E. The schedule and sequence of reclamation activities for the inactive tailings area shall be as specified in the licensee's submittal dated May 21, 1986.

Instrumentation to be monitored shall be as specified in Section 5.4 and Figure 5.5 of Volume II of the report entitled, "Stabilization and Reclamation of an Inactive Tailings Impoundment." The frequency of reading instrumentation shall be as follows:

- 1) During the first two (2) weeks and biweekly thereafter following construction in the vicinity of the instrumentation.
 - 2) Weekly for the next month.
 - 3) Monthly for the next six months.
 - 4) Quarterly thereafter.
- F. Construction of the reclamation cover shall be as specified in the licensee's submittal dated June 16, 1983 with the following exceptions:
 - 1) The clay cap material shall be compacted to at least 90 percent of its standard proctor maximum density (ASTM D698) at a moisture content between optimum and two (2) percent higher. If a lower degree of compaction is desired, permeability tests on samples of the clay

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material compacted to the desired density shall be performed to document that the permeability would not exceed 1 foot/year and the results submitted to the USNRC, Uranium Recovery Field Office, for review and approval prior to construction.

- 2) An Atterberg Limits and laboratory moisture-density test shall be performed on a composite sample from each clay borrow area to be used during a particular construction phase prior to initiation of work. In addition, four field density and four field moisture content tests shall be performed for each layer of clay placed. These tests shall be performed prior to placing cover material over the clay. The results of the field tests shall be correlated using the results of the laboratory tests.
 - 3) The cover material shall be compacted to between 85 and 90 percent of its standard proctor maximum density (ASTM D698). The soil cover shall be placed and compacted in two approximately equal lifts. Four field density tests shall be performed for each lift of soil cover material placed.
 - 4) A report summarizing construction activities for each phase of reclamation work and containing the results of all quality assurance testing shall be submitted to the USNRC, Uranium Recovery Field Office, within 60 days of completion of the activities.
 - 5) Following completion of the interim stabilization cover, the licensee shall thereafter perform documented inspections of the cover. The licensee shall, within 30 days of these inspections, weather permitting, provide for the repair of any area which could result in ponding of surface water due to settlement or exposure of tailings due to erosion.
55. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, for reclamation of any tailings or waste disposal areas, ground water restoration as warranted and the long-term surveillance fee. Within three (3) months of NRC approval of a revised reclamation/decommissioning plan, the licensee shall submit, for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within three (3) months of written NRC approval. Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC at least three (3) months prior to the anniversary of the effective date of the existing surety instrument. If the NRC has not approved a proposed revision to the surety coverage 30 days prior to the expiration date of the existing

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surety arrangement, the licensee shall extend the existing surety arrangement for 1 year. Financial surety coverage for the full amount of the NRC approved reclamation/decommissioning cost estimate shall not lapse for any time period prior to license termination.

Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the basis for the cost estimates with adjustments for inflation, maintenance of a 15 percent contingency fee, changes in engineering plans, activities performed and any other conditions affecting estimated costs for site closure. The licensee shall also submit to the NRC, all surety related correspondence provided to the State, a copy of the State's surety review and the final approved surety arrangement. The licensee shall also ensure that the surety, where authorized to be held by the State, expressly identifies the NRC portion of the surety and covers the decommissioning and decontamination of the mill and mill site, reclamation of the tailings and waste disposal areas, ground water restoration as warranted and the transfer of the long-term surveillance fee to the U.S. General Treasury. The basis for the cost estimate is the NRC approved reclamation/decommissioning plan or NRC approved revisions to the plan. Reductions in the estimate based on work accomplished or changes to the plan shall not be made without prior NRC approval.

Umetco Gas Hill's currently approved surety instrument, a surety bond with Seaboard Surety Company (No. 861822 for \$5,876,703) in favor of the State of Wyoming, shall be continuously maintained for the purpose of complying with 10 CFR 40, Appendix A, Criteria 9 and 10 until a replacement is authorized by both the State and NRC. This bond must be increased using a rider (as prescribed by State requirements), replaced or supplemented with another acceptable instrument by January 1, 1988, to include the total NRC approved reclamation/decommissioning estimate. The approved estimate currently totals \$10,566,000.

Attachment 5 outlines the minimum considerations used by the NRC in the review of decommissioning and reclamation estimates. Licensee submittals of reclamation/decommissioning plans should follow this guidance.

56. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of Wyoming) which is used for the disposal of such byproduct material or is essential to ensure the long term stability of such disposal site to the United States or State of Wyoming, at the State's option.
57. The USNRC will not terminate the license until final reclamation has been completed and meets all applicable USNRC regulations.

**MATERIALS LICENSE
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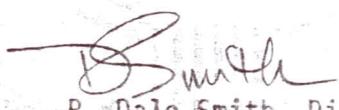
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58. The licensee is authorized to receive and dispose of 1,750,000 cubic yards of wastes from the Riverton processing site in the A-9 pit and reclaim in accordance with submittals dated September 10 and 16, 1987. Additionally, the licensee shall:

- A. Prior to placement of the final cover, verify that the interim cover is compacted to 95 percent of Proctor maximum density.
- B. Place the final cover clay and filter layers in compacted lift thicknesses not exceeding six (6) inches.
- C. Place the spoil layer in a loose-lift thickness not to exceed eighteen (18) inches.
- D. Assure that the riprap layer thickness is greater than 1.5 times the upper-limit D_{50} size, or the maximum D_{100} size, whichever is larger.
- E. Submit proposed filter bed and riprap gradation requirements for USNRC review and approval three (3) months prior to placement, but in any case no later than October 1, 1988.

FOR THE NUCLEAR REGULATORY COMMISSION



R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

Dated: _____

OCT 07 1987

UNITED STATES NUCLEAR REGULATORY COMMISSION

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT

PRIOR TO RELEASE FOR UNRESTRICTED USE

OR TERMINATION OF LICENSES FOR

BYPRODUCT OR SOURCE MATERIALS

U. S. Nuclear Regulatory Commission
Uranium Recovery Field Office
Region IV
Denver, Colorado 80225

SEPTEMBER 1984

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The instructions in this guide in conjunction with Table I specify the radioactivity and radiation exposure rate limits which should be used in accomplishing the decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use.

1. The licensee shall make a reasonable effort to eliminate residual contamination.
2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table I prior to applying the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.
3. The radioactivity on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.
4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:
 - a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature extent, and degree of residual surface contamination.
 - b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table I. A copy of the survey report shall be filed with the Uranium Recovery Field Office, Region IV, P.O. Box 25325, Denver, CO 80225. The survey report shall:
 - a. Identify the premises.
 - b. Show that reasonable effort has been made to eliminate residual contamination.
 - c. Describe the scope of the survey and general procedures followed.
 - d. State the findings of the survey in units specified in the instruction.

Following review of the report, the NRC will consider visiting the facilities to confirm the survey. The licensee shall not release the premises for unrestricted use without the written approval of the USNRC staff.

TABLE I

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES ^a	AVERAGE ^{b c f}	MAXIMUM ^{b d f}	REMOVABLE ^{b e f}
U-nat, U-235, U-238, and associated decay products	5,000 dpm /100 cm ²	15,000 dpm /100 cm ²	1,000 dpm /100 cm ²
Transuranics, Ra-226, Ra-228, Th-230, Th-118, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm ²	300 dpm/100 cm ²	20 dpm/100 cm ²
Tl-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm ²	3,000 dpm/100 cm ²	200 dpm/100 cm ²
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except SR-90 and others noted above.	5,000 dpm /100 cm ²	15,000 dpm /100 cm ²	1,000 dpm /100 cm ²

^aWhere surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

^bAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

^cMeasurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

^dThe maximum contamination level applies to an area of not more than 100 cm².

TABLE I

- 2 -

^eThe amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

^fThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

Lower Limits of Detection (LLD) for Sample Analysis

U-natural, Th-230, Ra-226 in air	-	1×10^{-16} $\mu\text{Ci/ml}$
Pb-210 in air	-	2×10^{-15} $\mu\text{Ci/ml}$
Rn-222	-	2×10^{-10} $\mu\text{Ci/ml}$
U-natural, Th-230, Ra-226 in water	-	2×10^{-10} $\mu\text{Ci/ml}$
Po-210 in water	-	1×10^{-9} $\mu\text{Ci/ml}$
Pb-210 in water	-	1×10^{-9} $\mu\text{Ci/ml}$
U-natural, Th-230, Ra-226, Pb-210 in soil and sediment (dry)	-	2×10^{-7} $\mu\text{Ci/g}$
U-natural, Th-230 in vegetation, food, and fish (wet)	-	2×10^{-7} $\mu\text{Ci/kg}$
Ra-226 in vegetation, food, and fish (wet)	-	5×10^{-8} $\mu\text{Ci/kg}$
Po-210, Pb-210 in vegetation, food, and fish (wet)	-	1×10^{-6} $\mu\text{Ci/kg}$

SAMPLE FORMAT FOR REPORTING
MONITORING DATA
REGULATORY GUIDE 4.14

TABLE 3^(a)

SAMPLE FORMAT FOR REPORTING MONITORING DATA

A. STACK SAMPLES

For each sample analyzed, report the following information:

- Date sample was collected
- Location of sample collection
- Stack flow rate (m³/sec)

<u>Radionuclide</u>	<u>Concentration</u> ($\mu\text{Ci}/\text{m}^3$)	<u>Error Estimate</u> ^(b) ($\mu\text{Ci}/\text{m}^3$)	<u>Release Rate</u> (Ci/gr)	<u>Error Estimate</u> (Ci/gr)	<u>LLD</u> ^(c) ($\mu\text{Ci}/\text{m}^3$)	<u>% MPC</u> ^(c)
U-235						
Th-230						
Rn-226						
Pb-210						

B. AIR SAMPLES

For each sample analyzed, report the following information:

- Date sample was collected
- Location of sample collection

<u>Radionuclide</u>	<u>Concentration</u> ($\mu\text{Ci}/\text{m}^3$)	<u>Error Estimate</u> ($\mu\text{Ci}/\text{m}^3$)	<u>LLD</u> ($\mu\text{Ci}/\text{m}^3$)	<u>% MPC</u>
U-235				
Th-230				
Rn-226				
Pb-210				
Po-210				

^(a) This table illustrates format only. It is not a complete list of data to be reported. (See text of guide and Tables 1 and 2.)

^(b) Error estimate should be calculated at 95% uncertainty level, based on all sources of random error, not merely counting error. Significant systematic error should be reported separately. See Sections 6.1, 7.1.4, and 7.3.

^(c) All calculations of lower limits of detection (LLD) and percentages of maximum permissible concentration (MPC) should be included as supplemental information.

TABLE 3 (Continued)

SAMPLE FORMAT FOR REPORTING MONITORING DATA

3. LIQUID SAMPLES

For each sample analyzed, report the following information:

- a. Date sample was collected
- b. Location of sample collection
- c. Type of sample (for example: surface, ground, drinking, stock, or irrigation)

<u>Radionuclide</u>	<u>Concentration ($\mu\text{Ci}/\text{ml}$)</u>	<u>Error Estimate ($\mu\text{Ci}/\text{ml}$)</u>	<u>LLD ($\mu\text{Ci}/\text{ml}$)</u>
U-nat (dissolved)			
U-nat (suspended) ^(d)			
Th-230 (dissolved)			
Th-230 (suspended) ^(d)			
Ra-226 (dissolved)			
Ra-226 (suspended) ^(d)			
Pb-210 (dissolved)			
Pb-210 (suspended) ^(d)			
Po-210 (dissolved)			
Po-210 (suspended) ^(d)			

4. VEGETATION, FOOD, AND FISH SAMPLES

For each sample analyzed, report the following information:

- a. Date sample was collected
- b. Location of sample collection
- c. Type of sample and portion analyzed

<u>Radionuclide</u>	<u>Concentration ($\mu\text{Ci}/\text{kg wet}$)</u>	<u>Error Estimate ($\mu\text{Ci}/\text{kg}$)</u>	<u>LLD ($\mu\text{Ci}/\text{kg}$)</u>
U-nat			
Th-230			
Ra-226			
Pb-210			
Po-210			

^(d) Not all samples must be analyzed for suspended radionuclides. See Sections 1.2 and 2.2 of this guide.

TABLE 3 (Continued)

SAMPLE FORMAT FOR REPORTING MONITORING DATA

D. SOIL AND SEDIMENT SAMPLES

For each sample analyzed, report the following information:

- a. Date sample was collected
- b. Location of sample collection
- c. Type of sample and portion analyzed

<u>Radionuclide</u>	<u>Concentration</u> ($\mu\text{Ci/g}$)	<u>Error Estimate</u> ($\mu\text{Ci/g}$)	<u>LLD</u> ($\mu\text{Ci/g}$)
U-238			
Th-230			
Ra-226			
Pb-210			
Po-210			

E. DIRECT RADIATION MEASUREMENTS

For each measurement, report the dates covered by the measurement and the following information:

<u>Location</u>	<u>Exposure Rate</u> (mR/qr)	<u>Error Estimate</u> (mR/qr)
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F. RAVEN FLUX MEASUREMENTS

For each measurement, report the dates covered by the measurement and the following information:

<u>Location</u>	<u>Flux</u> ($\text{pCi/m}^2\text{-sec}$)	<u>Error Estimate</u> ($\text{pCi/m}^2\text{-sec}$)
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RECOMMENDED OUTLINE FOR SITE SPECIFIC RECLAMATION
AND STABILIZATION COST ESTIMATES

As required under Criteria 9 and 10 of 10 CFR Part 40, Appendix A, the licensee shall supply sufficient information for NRC to verify that the amount of coverage provided by the financial assurance accounts for all necessary activities required under the license to allow the license to be terminated. Cost estimates for the following activities (where applicable) should be submitted to NRC with the initial license application or reclamation plan and updated annually as specified in the license. Cost estimates must be calculated on the basis of completion of all activities by a third party. Unit costs, calculations, references, assumptions on equipment and operator efficiencies, etc., must be provided.

Detailed Cost Information Breakdown for Mills and In-Situ Facilities

The detailed cost information necessary to verify the cost estimates for the above categories of closure work is described in the following outline.

I. FACILITY DECOMMISSIONING

Mill Site Decommissioning. - Dismantling, decontamination and/or disposal of all structures and equipment. - Excavation and burial of contaminated earth (in vicinity of mill site, ore storage area, access roads around the perimeter of the tailings disposal site, evaporation pond residues, etc.) - Reclamation of disturbed areas from the above clean up activities.

In Situ Facility Decommissioning - This includes dismantling, decontamination and disposal of all structures and equipment. This may be accomplished in two phases. In the first phase, only the equipment not used for ground-water restoration is removed. The remaining equipment would be removed in a second phase, when ground-water restoration and well plugging is complete. The buildings used for the in-situ operations may be decontaminated and released for unrestricted use.

A. Salvageable building and equipment decontamination (list). For each building or pieces of equipment listed, the following data should be provided.

1. Labor for dismantling and decontamination
 - a. Person-hours and categories of labor
 - b. Average hourly wage for each category

- c. Total labor cost (benefits, insurance, etc., and all labor overhead must be included here or calculated on the basis of total project labor)
 2. Equipment and material for dismantling and decontamination
 - a. Itemization of equipment and material to be used for decontamination
 - b. Itemized cost for material and equipment cost per hour listed in (a) above (equipment costs must include hourly operating, ownership and overhead expenses)
 - c. Operating hours for each piece of equipment
 - d. Total equipment and material cost
- B. Non-salvageable building and equipment disposal
 1. List of major categories of building and equipment to be disposed of and their corresponding quantities
 - a. Structures (list each major) (tons of material and building volume cubic feet)
 - b. Foundation concrete (cubic yards)
 - c. Process Equipment (tons)
 - d. Piping & Insulation (lump sum)
 - e. Electrical & Instrumentation (lump sum)
 2. Unit cost of disposal for each item above (include equipment, labor, material, transportation, and disposal costs)
 3. List and state how each chemical solution within the mill area will be disposed of along with the associated cost of disposal
 4. Total cost
- C. Restoration of contaminated areas (ore storage pad, access roads, process area, affected ground water, evaporation pond residues, etc.)

Removal and Disposal of Evaporation Pond and Residues - These materials should be transported to a licensed tailings area or licensed disposal site. The quantity of material to be removed and the distance to the disposal site and the fees charged by the receiving facility are important considerations in determining the costs of disposal.

Reclamation - This entails recontouring the well fields and evaporation ponds and placing top soil or other materials acceptable to NRC. This may also include revegetation.

1. Removal

- a. Area, depth and quantity of material to be removed (area, feet and cubic yard--or size of liner if appropriate)
- b. Unit cost (include excavation, loading, transportation and deposition)
- c. Total cost (equipment and labor)

2. Revegetation

- a. Area to be revegetated (acre)
- b. Unit cost (include fill material replacing topsoil, and revegetation cost)
- c. Total cost (equipment, labor and materials)

II. GROUND-WATER RESTORATION AND WELL PLUGGING

Mill Site Ground-Water Restoration - A major concern in the termination of a mill license is the restoration of aquifers that have been contaminated by the operation of a tailings impoundment. As this concern is added to the site-specific reclamation plans, the licensee should include these costs in their surety until the licensee is released from further ground water restoration activities.

In Situ Site Ground-Water Restoration - In most cases, ground-water restoration consists of ground water sweeping and water treatment with partial reinjection. The water treatment equipment used during the uranium recovery phase of the operation is generally suitable for the restoration phase. The capital cost of this equipment is usually absorbed during the initial stages of the operation leaving

only the costs of operation, maintenance and replacement filters for the restoration phase. However, if additional equipment will be required for restoration, associated costs should be detailed here.

- A. Method of restoration
- B. Volume of aquifer required to be restored - area and thickness of aquifer -- number of required pumping cycles -- cycling time
- C. Equipment associated with aquifer restoration (e.g., RO unit)
- D. Verification sample analysis
 - 1. number of samples
 - 2. unit cost for sample collection and analysis (per sample)
 - 3. total cost for verification sample analysis
- E. Well plugging
 - 1. number of drill holes to be plugged
 - 2. depth and size of each drill hole
 - 3. material to be used for plugging--include acquisition, transportation, and plugging
 - 4. Total cost for well plugging
- F. Total cost for ground-water restoration

III. INTERIM STABILIZATION OF TAILINGS DURING THE DRYING OUT PHASE

Interim Stabilization of the Tailings During Drying - Placement of soil, chemical spraying, snow fences or other control measures over dry tailings to minimize dusting or dispersal of particulates.

- A. Drying time
- B. Area of dry exposed tailings for each year during the drying period (acres for ____ years)
- C. Unit cost for placement of soil, chemical spraying or other methods (Price per acre) (Include material, labor, and equipment)

- D. Cost for an enhanced evaporation system, where included in the reclamation and stabilization plan. - Capital costs, labor and operating costs
- E. Total cost of interim tailings stabilization

IV. TAILINGS IMPOUNDMENT AREA RECLAMATION

Tailings Impoundment Area Reclamation - Earthwork necessary to recontour the tailings in order to prepare for cover placement. - Placement of cover materials - Revegetation and/or placement of riprap. - Construction of diversion channels or other measures required for long-term stability.

- A. Area and quantity of cover material (acres, cubic yards)
- B. Location and size of borrow area that serves as a source of cover material. (Include distance from borrow area to tailings impoundment, grade and quantity of material from each borrow area)
- C. Labor and equipment unit cost for each type of material (include excavation, loading, transportation, depositing, spreading, and compacting; detailing costs and equipment types and calculations for each function)
- D. Estimated costs for revegetation of tailings pile, if applicable, and borrow areas (labor, equipment and materials)
- E. Estimated costs for riprap/rock armor, if applicable (labor, materials, transportation and equipment)
- F. Estimated costs for special engineered features - diversion channels, spillways, etc. (in unit costs) (labor, materials and equipment)
- G. Estimated costs for a quality assurance program including field and laboratory testing to assure that the "as built" system conforms to design specifications. Indicate number and type of tests, labor and equipment costs.
- H. Fencing costs (unit costs for labor and materials) total length and type of material
- I. Additional control measures, if necessary (guard service, etc.)
- J. Total cost

If the reclamation plan calls for different layers of soil, such as clay, etc., Items IVA. through IVF. above should be provided for each layer. Reclamation estimates may not always have to include the entire project area (i.e., operations which involve phased reclamation need only include coverage for the maximum area impacted during the period of the license.)

V. RADIOLOGICAL SURVEY AND ENVIRONMENTAL MONITORING

Radiological Survey - Gamma surveys and soil samples for radium in areas to be released for unrestricted use. Soils around the mill building, tailings piles, well field, evaporation ponds and process buildings should be analyzed for radium content. A gamma survey of all areas should be made prior to release for unrestricted use. All equipment released for unrestricted use should be surveyed and records maintained.

- A. Soil samples for radium
- B. Decommissioning equipment and building smear samples
- C. Gamma survey
- D. Environmental monitoring

Costs of labor, materials and analysis for continuation of environmental monitoring program throughout reclamation

- E. Total cost 1. Number of each kind sample listed above
 - 2. Unit cost for sample and analysis (price per sample)
 - 3. Total cost for radiological survey

VI. PROJECT MANAGEMENT COSTS AND MISCELLANEOUS

Itemize estimated costs associated with project management, engineering changes, mobilization costs, legal expenses, power costs during reclamation, quality control radiological safety costs, etc.

VII. LABOR AND EQUIPMENT OVERHEAD, CONTRACTOR PROFIT

Overhead costs for labor and equipment and contractor profit may be calculated as separate items or loaded into hourly rates. If included in hourly rates, the unit costs must identify the percentages applied for each area.

VIII. LONG-TERM SURVEILLANCE AND CONTROL (FOR MILLS ONLY) CRITERION 10 SPECIFIES A MINIMUM OF \$250,000 IN 1978 DOLLARS (\$407,960 IN DECEMBER 1986 DOLLARS)

Long-term surveillance and control fund to cover the cost of federal government agency site inspection, monitoring, and control measures, if necessary.

IX. CONTINGENCY

The licensee should include a contingency amount to the total cost estimate for the final site closure. The staff currently considers a 15% contingency to be an acceptable minimum amount.

X. ADJUSTMENTS TO SURETY AMOUNTS

The licensee is required by 10 CFR 40, Appendix A, Criteria 9 and 10 to adjust their cost estimates annually to account for inflation and changes in reclamation plans. The submission should be in the form of a request for amendment to the license.

A. Adjustments for inflation

The licensee should submit a revised surety incorporating adjustments to the cost estimates for inflation ninety (90) days prior to each anniversary of the date on which the first reclamation plan and cost estimate was approved. The adjustment should be made using the inflation rate indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

B. Changes in Plans

- Changes in the process such as size or method of operation.
- Licensee initiated changes in reclamation plans or reclamation/decommissioning activities performed.
- Adjustments to reclamation plans required by the NRC.
- Proposed revisions to reclamation plans must be thoroughly documented and cost estimates and the basis for cost estimates detailed for NRC review and approval. Where a licensee is authorized by the NRC to secure a surety arrangement with the state, no reduction to the surety amount shall be initiated without prior NRC approval. Copies of all correspondence relating to the surety between the licensee and the State shall

be provided to the NRC. If authorized by the NRC to maintain a surety with the State as the beneficiary, it is the responsibility of the licensee to provide the NRC with verification of same, ensure that the agreement with the State specifically identifies the financial surety's application to the mill facility, ISL facility, tailings and related area decommissioning/reclamation and transfer of the long-term surveillance and control fee to the U.S. Department of the Treasury prior to license termination.

All costs (unit and total) are to be estimated on the basis of independent contractor costs (include overhead and profit in unit costs or as a percentage of total). Equipment owned by the licensee and the availability of licensee staff should not be considered in the estimate to reduce cost calculations. All costs should be based on current year dollars. Credit for salvage value is generally not acceptable on the estimated costs.

The NRC staff review may include a comparison of unit cost estimates with standard construction cost guides (e.g., Dodge Guide, Data Quest) and discussions with appropriate state or local authorities (highway cost construction). The licensee should provide supporting information or the basis for their selection of the unit cost figures used in their estimates.

58. The licensee is authorized to receive and dispose of 1,750,000 cubic yards of wastes from the Riverton processing site in the A-9 pit and reclaim in accordance with submittals dated September 10 and 16, 1987. Additionally, the licensee shall:
- A. Prior to placement of the final cover, verify that the interim cover is compacted to 95 percent of Proctor maximum density.
 - B. Place the final cover clay and filter layers in compacted lift thicknesses not exceeding six (6) inches.
 - C. Place the spoil layer in a loose-lift thickness not to exceed eighteen (18) inches.
 - D. Assure that the riprap layer thickness is greater than 1.5 times the upper-limit D₅₀ size, or the maximum D₁₀₀ size, whichever is larger.
 - E. Submit proposed filter bed and riprap gradation requirements for USNRC review and approval three (3) months prior to placement, but in any case no later than October 1, 1988.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: _____

R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

only this page formal

* See previous concurrence.

OFC	: *URFO	: *URFO	: *URFO	: *URFO	: *URFO	: URFO	:
NAME	: DJacoby	: RGonzales	: SGrace	: HRose	: EHawkins	: RDSmith	:
DATE	: 87/10/07	:	:	:	:	: 10/7/87	:

58. The licensee is authorized to receive and dispose of wastes from the Riverton processing site in the A-9 pit in accordance with submittals dated September 10 and 16, 1987. Additionally, the licensee shall:

- A. Prior to placement of the final cover, verify that the interim cover is compacted to 95 percent of Proctor maximum density.
- B. Place the final cover clay and filter layers in compacted lift thicknesses not exceeding six (6) inches.
- C. Place the spoil layer in a loose-lift thickness not to exceed eighteen (18) inches.
- D. Assure that the riprap layer thickness is greater than 1.5 times the upper-limit D₅₀ size, or the maximum D₁₀₀ size, whichever is larger.
- E. Submit proposed filter bed and riprap gradation requirements for USNRC review and approval three (3) months prior to placement.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: _____

R. Dale Smith, Director
Uranium Recovery Field Office
Region IV

OFC	: URFO	: URFO	: URFO	: URFO	: URFO	: URFO	:
NAME	: DJacoby	: RGonzales	: SGrace	: HRose	: EHawkins	: RDSmith	:
DATE	: 87/10/06	: 87/10/86	: 87/10/06	: 11/1/87	: 10/6/87	:	: