

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

Malapai Resources Company

1. (A wholly-owned subsidiary of
Arizona Public Service Company)

2. P.O. Box 20824
Phoenix, Arizona 85036

3. License number

SUA-1386, Amendment No. 3

4. Expiration date

October 31, 1986

5. Docket or
Reference No.

40-8771

6. Byproduct, source, and/or
special nuclear material

a. Natural Uranium

b. Byproduct Materials

7. Chemical and/or physical
form

a. Aqueous Solution
and slurry
b. Unspecified

8. Maximum amount that licensee
may possess at any one time
under this license

a. That amount produced
under licensed activities
b. That amount produced
under licensed activities

9. Authorized Place of Use: SE 1/4 SW 1/4 Section 26 of NE 1/4 NW 1/4 Section 35, T34N, R73W, Converse County, Wyoming approximately 16 road miles east of Glenrock, Wyoming and approximately 16 road miles northwest of Douglas, Wyoming.
10. Authorized use for uranium recovery from pregnant leach solution in accordance with the process specified in Figure 3.2, with the exception of flow rates, of the licensee's June, 1980 Environmental Report.
11. The uranium in situ solution mining operations shall be performed on a maximum wellfield area of 1.4 acres containing two wellfields, each wellfield consisting of two five-spot patterns as shown in Figure 3.8 of the licensee's submittal dated May 26, 1981. Any additional wellfield(s) shall require USNRC approval in the form of a license amendment.
12. Variation from the sodium bicarbonate leach solution with hydrogen peroxide or oxygen added, as proposed by the licensee, shall require prior USNRC approval through amendment of this license. The licensee shall discuss why he proposes the variation and how it will affect groundwater quality, the pond water characteristics, restoration methods and criteria, and monitoring requirements.
13. The six (6) perimeter ore-zone monitor wells and the four (4) wellfield monitor wells in the locations shown in Figure 3.9 of the licensee's submittal dated May 26, 1981, shall be constructed and used to monitor and establish the premining groundwater levels and baseline water quality in the test area. Well completion

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

data for these ten (10) monitor wells and each injection/production well, in the form of Table 2.10 of the June, 1980 Environmental Report, shall be submitted to the USNRC, Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80225 upon completion of construction. All of the monitor wells, and at least 1 injection/production well from each wellfield shall be sampled, with water levels measured prior to sampling, at least four (4) times, at a minimum of weekly intervals, prior to injection of leach solution and analyzed for all the indicators listed in Table 2.2.1.02 of the Environmental Impact Appraisal (EIA). All other injection/production wells in each wellfield shall be sampled at weekly intervals on at least three separate occasions prior to injection of lixiviant, and analyzed for all excursion indicators listed in License Condition No. 15.

14. At least sixty (60) days prior to termination of mining activities, in either wellfield, the licensee shall file with the USNRC, Uranium Recovery Field Office, a specific plan for groundwater quality restoration at the test site including a description of restoration methods, projected schedule of activity, and plans for restoration and post-restoration monitoring. The licensee shall notify the USNRC, Uranium Recovery Field Office, within thirty (30) days of any subsequent changes to the above restoration methods and monitoring plans. Restoration of the production aquifer groundwater in each wellfield and any other groundwater that may be affected by mining operations shall be initiated within sixty (60) days after solution mining operations have been terminated. The licensee shall provide written notification to USNRC, Uranium Recovery Field Office, that restoration activities are being initiated.

The objective of restoration shall be to return the groundwater quality, on an indicator by indicator basis, to baseline concentrations wherein baseline concentration is defined as the sample mean plus twenty (20) percent of the mean. Proposed restoration criteria shall be submitted to the USNRC prior to initiating restoration activities.

15. During solution mining operations, the monitor wells identified in License Condition No. 13 above shall be sampled for chloride and TDS every two (2) weeks and analyzed for chloride, alkalinity, bicarbonate, selenium, sodium, uranium, sulfate and TDS once every month. Water level elevations in these wells shall also be measured once every two weeks prior to sampling. Once per quarter, a set of samples from all of the monitor wells shall be analyzed for the full suite of water quality indicators as listed in Table 2.2.1.02 of the EIA. Results shall be reported graphically and in tabular form in the quarterly reports required in License Condition No. 29 below.
16. Upper control limit (UCL) criteria to be applied to monitor wells to determine when action must be taken to control excursions during mining shall be based upon the premining baseline water quality data collection outlined in License Condition No. 13 above. Proposed upper control limits for the excursion indicators listed in License Condition No. 15 above and baseline water quality data shall be submitted to the USNRC prior to injection of lixiviant. The upper control limit

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

for each excursion indicator shall be defined, on a well by well basis, as 1.38 multiplied by the sample standard deviation with the result added to the sample mean.

If two UCL values are exceeded in a well, or if one UCL value is exceeded by 20% of the UCL, the licensee shall take another water sample within forty-eight (48) hours and analyze it for at least the eight indicators listed in License Condition No. 15 above. An excursion is confirmed if two or more UCL values are exceeded or if one UCL value is exceeded by 20% of the UCL or more. Corrective action to mitigate the situation shall be initiated by the licensee when an excursion is confirmed and the USNRC, Uranium Recovery Field Office, shall be notified within forty-eight (48) hours by telephone and within seven (7) days in writing. Corrective actions shall be maintained until the excursion is concluded. In addition to corrective actions, monitoring shall be intensified; sampling frequency and analysis of excursion status wells shall be at least once every seven (7) days for the eight indicators listed in License Condition No. 15 above, as long as those wells are on excursion status. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion.

If corrective actions have not been effective within 90 days of excursion confirmation, the injection of lixiviant shall be terminated. Resumption of injection shall require USNRC approval in the form of a license amendment.

17. A formal report of events describing the corrective actions taken and detailed graphs and tables of all sample analyses shall be maintained during excursions as described in License Condition No. 16 above to document actions and the ensuing results. This report, along with data obtained from the analysis of at least two separate samples taken before and after an excursion, shall be submitted to the USNRC, Uranium Recovery Field Office, as part of the routine quarterly reports required in License Condition No. 29.
18. Baseline water level elevations for each monitor well shall be defined and submitted to the USNRC, Uranium Recovery Field Office, prior to the injection of lixiviant. The water level of each monitor well shall be monitored once daily for the first two (2) weeks of continuous operation of that particular wellfield. After the initial two weeks, water level monitoring can be decreased to once every two weeks and measured just prior to water quality sampling.

Net flow rates for the wellfield shall be recorded whenever monitor well water levels are measured; barometric pressure at the site or vicinity and its effect on water levels should also be recorded. Hydrologic monitoring shall continue as described in this condition until restoration of the ore zone begins. An evaluation of the net flow balance, along with water level data, in graphical and tabular form, shall be submitted in a separate section of each quarterly report, as described in License Condition No. 29 below until the monitoring is discontinued.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUA-1386

Docket or Reference number

40-8771

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20. The volume of discharges to the evaporation ponds shall be recorded. Quarterly samples of bleed solution shall be analyzed for calcium, chloride, alkalinity, sodium, uranium, radium-226, sulfate, and TDS.

21. The two evaporation ponds shall be monitored for leaks on a daily basis. Any fluid detected in the standpipes of the pond leak detection systems shall be analyzed initially for chloride and TDS. If these concentrations exceed Wyoming Department of Environmental Quality (WDEQ) Drinking Water Standards, then water shall be analyzed for calcium, chloride, alkalinity, sodium, uranium, radium-226, selenium, arsenic, sulfate, and TDS. If the chemical quality of the fluid found in the standpipe exceeds WDEQ Drinking Water Standards for any of the indicators tested, the licensee must take immediate steps to repair the leak, and the USNRC shall be notified within forty-eight (48) hours. Water quality samples taken at the standpipe shall be sampled for all ten (10) indicators at least every seven (7) days during the leak period and for at least two (2) weeks following repair, if any residual liquid remains in the standpipes. The results of all standpipe analyses shall be reported to the USNRC Uranium Recovery Field Office, in the quarterly report as per License Condition No. 29 below.

A report describing the actions taken by the licensee to repair the pond and the results of those actions shall be included with the quarterly report described in License Condition No. 29 below.

22. The licensee shall comply with the following requirements regarding construction and operation of the evaporation ponds:

- A. The location of the ponds shall be that site investigated in the report entitled "Geotechnical Investigation for the Proposed Surface Facilities, Arizona Public Service, Peterson Project, Converse County, Wyoming" by F.M. Fox and Associates, Inc., dated February 29, 1980.
- B. The ponds shall have a maximum depth of 9 feet, measured from the embankment crest to the pond bottom, a minimum crest width of 8 feet, and exterior and interior slopes of 3H:1V. The embankment fill shall consist of subsoils excavated from the interior of the ponds and compacted to a minimum of 90% of their maximum dry densities and placed within plus or minus 2% of their optimum moisture contents as determined by ASTM D-1557. For each significantly different soil type used for fill material, a moisture-density curve shall be developed using the ASTM method above.
- C. Embankment fill shall be laid down in loose lifts not to exceed 8 inches in thickness. No frozen materials or oversized material (greater than 6") shall be used as fill, and no fill shall be placed on top of frozen materials.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

- D. The method of compaction testing shall be utilized to ensure compliance with License Condition No. 22(b) above is the "Density of Soil in place by the Sand Cone Method" (ASTM D-1556), or "Density of Soil and Soil-Aggregate in place by Nuclear Methods" (ASTM D-2922). If the latter method is utilized, the nuclear density measurement equipment shall be calibrated by use of the sand cone method as prescribed in ASTM D-2922.
- E. The location of each moisture-density field test shall be randomly selected by the engineer-in-charge to be representative of the work performed. As a minimum there shall be a test taken for each lift, each construction shift during which fill is placed; and when the engineer deems additional testing is necessary. In no case, however, will more than 1,000 cubic yards of material be compacted without a test. The results of the tests and the location where each test was taken shall be recorded and included with the construction report described in License Condition No. 22(m). All areas that fail that moisture-density testing shall be reworked and retested.
- F. Prior to placing the material forming the layer in which the leak detection pipes are placed, the subgrade shall be stabilized and recompact to the criteria in License Condition No. 22(b) above. A bentonite layer, at least 3 inches thick, shall be placed over the subgrade and compacted to a smooth surface having a tolerance of less than or equal to 0.1 feet over a 10-foot straightedge.
- G. The leak detection piping network and the inspection sumps shall be installed at the locations shown on Figure 3.7 of "APS Supportive Information for Application for Source Material License, Peterson In Situ Uranium Extraction Project", dated June 1980. The perforated pipe shall be placed in shallow trenches lined with the bentonite, and a bedding layer of sand and/or gravel shall then be placed in the trenches and in a layer at least 6 inches thick directly beneath the pond liner. At least two gradation tests correlated to permeability shall be performed on the bedding sand/gravel to verify the required minimum of two orders of magnitude greater permeability than that of the subgrade.
- H. Prior to liner placement, the leak detection system shall be tested to assure that it functions properly. The leak detection system operation tests shall consist of discharging water, at four different flow rates varying from 1 to 50 gallons per minute, on top of the leak detection bedding material. The locations in each pond shall be visually selected by the engineer to be as far as possible from the perforated collector pipes. Two of the four tests shall be performed in each pond. The sump shall then be monitored to determine if the water reaches the sump. If water is detected in the sump, the system shall be deemed acceptable. If water does not reach the sump, the system shall not be deemed acceptable until it passes the above described test. The licensee shall record the travel time, amount, and flow rate of water applied to the system, and the amount and flow rate of water collected

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUA-1386

Docket or Reference number

40-8771

COPY

at the sump. The USNRC, Uranium Recovery Field Office, shall be notified by telephone of the results of the tests within two days after their completion. The results of these tests shall be included in the construction report described in License Condition No. 22(m).

- I. The ponds shall be lined with a 36-mil reinforced synthetic liner anchored in trenches at the crest of the impoundments. Prior to liner placement, the licensee shall submit a quality assurance program for installation and testing of the liner. Requirements for testing of field seams, and data documenting the compatibility of the liner with the expected waste products shall be included.
- J. The licensee shall maintain at least two feet of freeboard between the embankment crest and the normal operating pond level.
- K. The licensee shall at all times maintain sufficient reserve capacity in the evaporation pond system to enable the transfer of the contents of a pond to other ponds in the event of a leak. In the event of a leak and subsequent transfer of liquid, the freeboard requirements of License Condition No. 22(j) shall be discontinued while the liner is being repaired.
- L. A fence that prevents the intrusion of game animals into the evaporation pond areas shall be maintained.
- M. Within 6 months after completion of the ponds, the licensee shall submit a report detailing the construction methods, construction controls, quality assurance programs, and testing methods that were actually utilized in the construction, installation, and testing of the ponds, leak detection system, and liner. This report shall also provide test results obtained during construction and as-built drawings showing details of construction of the various components of the pond.
- N. The licensee shall notify USNRC, Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80225, at least three weeks prior to the completion of the ponds to provide adequate time for on-site inspections by the NRC.
- O. Prior to the start of the facility operations, the licensee shall submit for USNRC review and approval, a revised topsoil stockpile configuration for diversion of surface water runoff from the pond area.
- P. The licensee shall perform daily visual inspections of all evaporation pond embankments. If a problem is detected, corrective action shall be initiated as soon as possible. Each daily inspection shall be documented, and the documentation shall be retained onsite.
23. Final disposition of radioactive solid process and evaporation pond residues (byproduct material) shall be at a USNRC licensed tailings disposal site.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUA-1386

Docket or Reference number

40-8771

24. The uranium recovery plant shall be operated at a maximum flow rate of one-hundred (100) gpm.
25. The licensee shall perform the radiological environmental monitoring program as outlined in Table 5.2.01 of the EIA. Preoperational data from this program shall be provided to the USNRC in the first quarterly report discussed in License Condition No. 29 below.
26. Exploration boreholes, post-test boreholes, and all wells within the wellfield area not used in production or monitoring and not properly cased or sealed within a specific unit shall be plugged prior to injecting lixiviant to comply with Wyoming Department of Environmental Quality requirements. All wells shall be plugged prior to decommissioning the site for unrestricted use.
27. The licensee shall conduct mechanical well integrity tests on each well that will be used for injection before leach solution injection commences. Bottom-hole pressures cannot exceed 200 psi because the casing used for injection and recovery wells is rated at 200 psi. During the well integrity test, a packer shall be placed within the casing and immediately above the well screen. The second packer shall be placed immediately below the well head. Groundwater derived from another well shall be discharged under pressure into the well casing between the two packers so that a pressure of 100 psi is achieved in the well. After this pressure is achieved, the well shall be shut in and the psi reading on the pressure gauge shall be recorded every 30 seconds for at least a ten (10) minute time period. If the pressure drops more than 3 psi over this time period, the well casing shall be considered suspect and checked for cracks or holes via a down-hole TV camera or other method. If possible, the well shall be repaired and the packer test shall be repeated. If any well casing cannot be repaired or corrected, the well shall be plugged, abandoned, and reclaimed. The results of the well integrity tests shall be submitted to the USNRC, Uranium Recovery Field Office prior to wellfield operation and injection of lixiviant.
28. Flow rates on each injection and recovery well and injection pressures on injection wells shall be measured at least once per day and recorded on a daily operational log. During wellfield operations, injection pressures shall not exceed the integrity test pressure of 100 psi at the injection well heads. This will assure that both pipe design pressure and fracture pressure in the ore zone and adjacent confining layers are not exceeded.
29. A quarterly report shall be submitted to the USNRC, Uranium Recovery Field Office, that summarizes the status of the R&D in situ test program, with supporting analytical data and evaluations regarding important environmental aspects of the operations such as water quality and water level data, lixiviant migration control, waste generation volumes, volumes and representative chemical analyses of injected lixiviant, and pregnant solution produced. The quarterly report shall include all data on environmental monitoring as well as groundwater data. All

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

water quality and water level data shall be presented in tabular and graphical form, with a written summary explaining what the data show.

30. All sampling and monitoring data, calibration records, reports on audits, inspections, and other analyses, training records, and safety meeting minutes, as well as any subsequent reviews, investigations, and corrective actions, shall be documented. Unless otherwise specified in the USNRC regulations, all such documentation shall be maintained for a period of at least five (5) years.
31. The licensee shall notify, in writing, the USNRC Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80226, at least six (6) weeks prior to commencing mining operations so that USNRC inspection may be conducted to review the licensee's development and implementation of administrative and operating procedures and monitoring programs.
32. The licensee shall have a documented commitment to ALARA which provides for the following:
1. Dissemination and posting of information and policy statements on radiation safety for employees, contractors, and visitors.
 2. Semiannual ALARA audit of the radiation safety program. The audit shall be performed by the Safety and Environmental Affairs Manager or Nuclear Assurance Corporation or other qualified expert with equivalent qualifications.
 3. Annual management review of the health physics program, its staff, and the allocation of adequate space and money.
33. The Safety and Environmental Affairs Manager shall have the following responsibilities:
1. Authority to enforce regulations and corporate policies that affect any aspect of the facility radiation safety program.
 2. Responsibility to plan and administer the ALARA audit and radiation safety training programs.
 3. Authority to review and concur in writing on plans for new equipment, process changes, or changes in operating procedures prior to implementation and to concur that the changes do not adversely impact the radiation safety program or the ALARA objective.
34. The Environmental/Safety Supervisor shall have the following responsibilities:
1. Supervise, evaluate, and assure that all in-plant and environmental surveys are properly documented and that such records are maintained.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

COPY

2. Assure that worker exposures are measured or calculated, documented, and that such records are maintained.
 3. Perform inspections of the facility to assure compliance with the regulations and the radiation safety program.
 4. Daily review of the facility maintenance work order logs to assure that prescribed radiation safety procedures were followed.
 5. Annually review all facility operational and monitoring procedures to assure they are still appropriate and not in conflict with newly established radiation safety policies or regulatory requirements.
35. The Environmental/Safety Supervisor (ESS) shall have the following minimum qualifications:
1. Education: An associate degree in the physical sciences, engineering, or a health-related field. Alternatively, a high school diploma plus four years of relevant work experience in applied radiation protection are acceptable.
 2. General Experience: One year of previous work experience in a uranium recovery facility or related industry involving radiation protection.
 3. Health Physics Experience: One year work experience using radiation detection equipment and analytical laboratory procedures that involve health physics, industrial hygiene, or industrial safety measures to be applied in uranium recovery operations.
 4. Specialized Training: At least four (4) weeks of formalized training in radiation health protection applicable to radiation hazards normally experienced at uranium recovery facilities.
 5. Specialized Knowledge: A working knowledge of the proper operation of health physics instruments to be used in the recovery facility for surveying and sampling techniques, and personnel dosimetry requirements.

If the individual selected for the ESS position does not meet the educational requirements specified above, however he or she possesses prior work experience in radiation safety, then the licensee may consider two years of applied radiation safety work experience as a substitute for each year of the college level educational requirement. In cases where the ESS possesses a college degree, with major emphasis in the area of the physical sciences and some specialized courses in radiation safety, the requirement for additional specialized training may be waived.

36. The Safety and Environmental Affairs Manager (SEAM) shall have the following minimum qualifications:

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

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1. Education: A bachelor's degree in the physical sciences or engineering from an accredited college or university.
 2. General Experience: One year of supervisory experience and one year of experience in a uranium recovery facility or related industry.
 3. Health Physics Experience: One year of work experience in applied health physics, radiation protection, industrial hygiene, or similar work. This experience should involve actually working with radiation detection and measurement equipment rather than only administrative or "desk" work.
 4. Specialized Training: A formalized intensive course in health physics of at least four (4) weeks duration. At least one (1) week of the course should be specifically applicable to health physics problems associated with uranium recovery facilities. In addition, every two (2) years the SEAM shall attend a refresher course on health physics.
 5. Specialized Knowledge: A thorough knowledge of the proper application and use of all health physics equipment used in the uranium recovery facility, the chemical and analytical procedures used for radiological sampling and monitoring, and the methods used to calculate personnel exposure to uranium and its daughters.

If the individual selected for the SEAM position does not meet the educational requirements specified above, however, he or she possesses prior work experience in radiation safety, the licensee may consider two (2) years of applied radiation safety work experience as a substitute for each year of the college level educational requirement. In cases where the SEAM possesses a graduate degree, with major emphasis in radiological and environmental sciences, the requirement for specialized training may be waived.

37. Standard written operating procedures shall be established for all operational activities involving radioactive materials that are handled, processed, stored or transported. Written procedures shall also be established for nonoperational activities, to include in-plant and environmental monitoring, sampling, analysis, and instrument calibration. An up-to-date copy of each written procedure shall be kept in each area where it is used.

All written procedures for both operational and nonoperational activities shall be reviewed and approved in writing by the Safety and Environmental Affairs Manager before being implemented and whenever a change in a procedure is proposed to ensure that proper radiation protection principles are applied. The Environmental/Safety Supervisor shall review all existing operating procedures on an annual basis. For work or nonroutine maintenance for which no standard written operating procedures already exists, a radiation work permit (RWP) shall be required. Such permits describe the following:

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUA-1386

Docket or Reference number

40-8771

1. The scope of the work to be performed.
2. Any precautions necessary to reduce exposure to uranium and its daughters to as low as is reasonably achievable.
3. Any supplemental radiological monitoring and sampling necessary during and following completion of the work. Nonroutine maintenance involving exposure of workers to airborne particulates of uranium and its daughters shall require the use of continuous breathing zone monitoring.

The ESS shall indicate, by signature, the review of each RWP prior to the initiation of work, and the work shall be carried out in strict adherence to the conditions of the RWP. When the ESS is not available, a supervisory member of the production staff who has received specialized radiation protection training may review and sign RWPs.

38. The licensee shall have a training program as described below.

An initial training program shall be conducted by the SEAM or other expert with equivalent qualifications. This training program shall include: the basic principles of radiation safety; the health hazards of exposure to uranium and its daughters; the personal hygiene practices for a uranium recovery facility; the facility radiation safety procedures; and the appropriate response to emergencies and accidents involving exposure to radioactive materials.

Upon completion of the initial training program, each individual shall be given a written examination. Each worker must achieve a predetermined passing score on the examination. The instructor shall review the incorrect answers with the worker until the instructor determines the worker has a passing knowledge of the instructional information. The examinations shall be maintained on file. Annually, each permanent facility worker shall be given a refresher training course. Retraining shall include: a discussion of relevant information that has become available during the past year; a review of safety problems during the past year; a discussion of the changes in regulations and license conditions; an explanation of exposure trends; and a discussion of other pertinent topics. Also, six (6) times a year, all permanent site workers shall attend a general facility safety meeting at which radiation safety problems shall be offered for discussion. Safety meeting minutes, attendance records, and training program records shall be maintained on file.

All permanent site workers shall be given specialized instruction on the radiation health and safety aspects of the specific jobs they will perform. This instruction shall be in the form of individualized on-the-job training performed by supervisors with the assistance of the ESS.

39. The licensee shall perform monthly surveys for natural uranium in the process area and in all enclosed structures inhabited by workers with the exception that the

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License number

SUA-1386

Docket or Reference number

40-8771

surveys shall be increased to weekly for any enclosed area meeting the requirements of an "airborne radioactivity area" as defined in 10 CFR Part 20.203 (d) and an investigation of the cause of the high level shall be made. The licensee shall also perform monthly surveys for radon or radon progeny in all enclosed structures inhabited by workers with the exception that radon or radon progeny surveys shall be increased to weekly if the radon or radon progeny concentrations are found to exceed 8 pCi/l or 0.08 WL (Working Levels), respectively. Such weekly sampling shall be maintained until four (4) consecutive weekly samples exhibit less than 8 pCi/l or 0.08 WL. At least ninety (90) days prior to commencing operations, the licensee shall submit to the USNRC, Uranium Recovery Field Office, for review and approval in the form of a license amendment, the designated locations for surveys of airborne natural uranium and radon or radon progeny.

The calculation of internal exposure to radon, radon progeny, or natural uranium shall be based on a TWE (Time Weighted Exposure) calculation incorporating a consideration of both occupancy times and average airborne working level or activity concentrations. If occupancy times are established as an average for each category of worker, then the licensee shall also, by means of a semiannual time study, determine the basis upon which average occupancy periods are established.

If any employee reaches or exceeds 25 percent of the maximum permissible exposure limits as specified in 10 CFR Part 20 based upon a calculated TWE for the week or the calendar quarter, dependent on the solubility of the material, the ESS shall initiate an investigation of the employee's work record and exposure history to identify the source of the exposure. Necessary corrective measures shall be taken to ensure reduction of future exposures to as low as is reasonably achievable. Records shall be maintained of these investigations.

40. The licensee shall perform quarterly gamma radiation surveys in the restricted area. At least ninety (90) days prior to commencing operations, the licensee shall submit to the USNRC, Uranium Recovery Field Office, for review and approval in the form of a license amendment, the locations for the gamma radiation survey.
41. The licensee shall perform alpha contamination surveys of the facility laboratory and offices monthly, and of the eating and change areas, weekly. If the licensee performs the analysis of urine bioassay samples at a facility laboratory, the licensee shall also survey all surfaces used for urine sample preparation preceding the analyses.

If the alpha contamination levels exceed those listed in the attached "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, the area shall be decontaminated. The source of the contamination shall be determined, control measures shall be initiated, and the results shall be documented.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
SUA-1386

Docket or Reference number
40-8771

42. Any changes in the process circuit, with the exception of flow rates, as illustrated and described in Figure 3.2 of the license application supplemental Environmental Report dated June, 1980, shall require the approval of the SEAM and shall be submitted to the USNRC, Uranium Recovery Licensing Branch, for prior approval in the form of a license amendment.
43. The licensee shall use external personnel dosimeters, either TLD or film type dosimeters, for all operating personnel and the dosimeters shall be exchanged monthly. The dosimeters shall be designed to measure exposure to penetrating radiation (e.g., gamma radiation and beta particles) with a range greater than 7 mg/cm².
44. The licensee shall implement a bioassay program as outlined in USNRC Regulatory Guide 8.22, "Bioassay of Uranium Mills," with the following exceptions:
1. The licensee shall perform a baseline urinalysis for all permanent employees prior to their initial assignment at the facility.
 2. The frequency of urine sample collection shall be monthly.
 3. Anytime an action level of 15 $\mu\text{g U/l}$ urine is reached or exceeded for any worker, the licensee shall provide documentation to the USNRC indicating what corrective actions have been performed to satisfy the requirements of USNRC Regulatory Guide 8.22. This information shall be included as part of the ALARA audit report required by license condition No. 45.
- Anytime an action level of 30 $\mu\text{g U/l}$ for four (4) consecutive urine specimens or 130 $\mu\text{g U/l}$ for any one specimen is reached or exceeded, the licensee shall provide documentation within thirty (30) days to the USNRC, Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80225, indicating what corrective actions have been performed to satisfy the requirements of USNRC Regulatory Guide 8.22.
45. The licensee shall perform a semiannual ALARA audit of the radiation safety program which shall be conducted by the Safety and Environmental Affairs Manager or other expert with equivalent qualifications who shall submit a detailed, written report to the Plant Manager, and the USNRC, Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80225. In order to evaluate the ALARA objective, the licensee shall review the following records as part of the semiannual audit:
1. Bioassay results including any actions taken when the results exceeded action levels in Table 1 of USNRC Regulatory Guide 8.22.
 2. Exposure records of external and internal and time-weighted calculations.
 3. Safety meeting minutes, attendance records, and training programs records.
 4. Daily inspection log entries and summary reports of the monthly reviews.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number

SUA-1386

Docket or Reference number

40-8771

COPY

5. In-plant radiological survey and monitoring data as well as environmental radiological effluent and monitoring data.
6. Surveys required by radiation work permits.
7. Reports on overexposure submitted to USNRC, MSHA, or the state.
8. Reviews of operating and monitoring procedures completed during this period.

The written semiannual audit report shall be specific in addressing any noticeable trends in personnel exposures for identifiable categories of workers and types of activities, and trends in radiological effluent data, and the performance of exposure and effluent control equipment and whether it is being properly used, maintained, and inspected. Any recommendations to further reduce personnel exposures or environmental releases of uranium or radon and radon daughters shall be included in the report.

46. Eating shall only be allowed in administrative offices and in enclosed lunch areas.
47. All personnel returning from the process area shall monitor for contamination, using a calibrated alpha survey instrument, before entering the office or the laboratory.
48. The licensee shall provide and require that all process and maintenance workers who work in yellowcake areas or work on equipment contaminated with yellowcake wear protective clothing including coveralls and boots or shoe covers. Workers who package slurry for transport shall also be provided gloves. Before leaving the restricted area, all process workers involved in the precipitation through packaging for transport of yellowcake slurry shall either shower and/or monitor their face and hands using a calibrated alpha survey instrument. Where alpha monitoring is used exclusive of showering, the monitoring results shall be documented and maintained on file. In addition, the licensee shall perform spot surveys for alpha contamination at least monthly on all workers leaving the facility proper. Alpha contamination greater than 1000 dpm/100 cm² on skin or clothes shall be cause for decontamination and resurveying, and for an investigation by the radiation safety staff. Records shall be maintained of these investigations.
49. Release of equipment, materials, or packages from the restricted area shall be in accordance with the enclosed "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.
50. All radiation monitoring, sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually, whichever is more frequent. In addition, all radiation survey instruments shall

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number
SUA-1386

Docket or Reference number
40-8771

be operationally checked with a radiation source before each use. Furthermore, for airborne radioactive particulate samplers, air flow rates through filters shall be determined by calibrating pumps for the filter paper used and the altitude of the facility.

51. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR Part 20 for posting areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "CAUTION - ANY AREA OR ROOM WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL".
52. The licensee shall develop a quality assurance program for all sampling and analyses performed as part of the in-plant radiation safety and environmental monitoring programs that includes all of the recommended elements of a quality assurance program specified in USNRC Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment. In addition, at least ninety (90) days prior to commencing operations, the licensee shall submit to the USNRC, Uranium Recovery Licensing Branch, for review and approval complete specifications for this quality assurance program.
53. In addition to the responsibilities specified in License Condition No. 34, the ESS shall perform a daily "walkthrough" inspection of the operating area. Any items of noncompliance or violations of procedures, policies, regulations or license requirements shall be documented in a log and maintained on file. All problems noted having safety implications shall be brought to the attention of the Plant Manager and proper remedial action taken.
54. At least ninety (90) days prior to commencing operations, the licensee shall develop and submit to the USNRC, Uranium Recovery Field Office, for review and approval, a general plan for emergency procedures that specifies a position responsible for development of written emergency procedures for the facility, those areas or situations for which emergency procedures will be developed, the items or areas of concern to be addressed in the emergency procedures including notification and actions to be taken in case of an emergency, and a commitment to rereview these emergency procedures at least annually. Emergency situations which should be addressed in the procedures include: evaporation pond dam failure, yellowcake spills, tank or pipe breaks, etc.
55. Degraded resin shall be transferred to a USNRC licensed uranium recovery facility for disposal in their tailings impoundment or the resin shall be shipped to a licensed radioactive waste disposal site.
56. The licensee shall immediately notify the USNRC, Uranium Recovery Field Office, P.O. Box 25325, Denver, CO 80225, by telephone or telegraph, of any failure of an evaporation pond, any break or rupture of any pipeline, or any similar failure of any other fluid or material conduit or storage facility which results in an

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uncontrolled release of radioactive materials, or of any unusual conditions which if not corrected could lead to such a failure. Such notification shall be followed, within seven days, by submittal of a written report detailing the conditions leading to the failure or potential failure, corrective actions taken, and results achieved. This requirement is in addition to the requirements of 10 CFR Part 20.

57. The licensee shall reclaim and decommission the wellfield and process facility sites as discussed in Section 3.7.2 of the EIA.
58. The licensee shall maintain a surety to cover all groundwater restoration, reclamation, and decommissioning including the cost of offsite disposal of radioactive solid process or evaporation pond residues. The licensee shall provide a copy of the surety along with a cost breakdown to the USNRC, Uranium Recovery Field Office, for review and approval 60 days prior to injection of lixiviant.
59. This license shall not be terminated until the USNRC has determined that all site reclamation, decommissioning, and wellfield restoration has met all applicable standards and regulations.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date: DEC 19 1985

BY

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

OFC	URFO	URFO	URFO	URFO			
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DATE	85/11/26	11-26-85	12/15/85	12/19/85			