



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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JUL 29 1980

WMUR:RSK
Docket No. 40-8304

MEMORANDUM FOR: Ross A. Scarano, Chief
Uranium Recovery Licensing Branch

FROM: Ronald S. Kaufmann
Uranium Recovery Licensing Branch

SUBJECT: RENEWAL OF LICENSE WYOMING MINERAL
CORPORATION LICENSE SUA-1204

Scope of Renewed License

By letter dated February 5, 1980, Wyoming Mineral Corporation (WMC) applied for renewal of Source Material License SUA-1204 (Docket No. 40-8304). The original license, which was dated July 5, 1974, permitted WMC to "... receive, possess and import..." source material during operation of research and development (R & D) uranium in situ extraction facilities at 5 claims. Since the granting of the R & D license, only the Irigaray claim has been actively mined. Under the R & D license, uranium has been extracted from the Irigaray claim at three sites; the "A" field, the 5I7 field and the USMT field. During 1978, WMC was granted an NRC in situ commercial-scale license for a portion of the Irigaray claim (License SUA-1341, Docket No. 40-8502). The commercial-scale license, which is still in effect, encompasses only one of the three R & D well field areas, the "A" field. WMC will be filing within two years for an extension of their commercial-scale license to cover the entire Irigaray claim including the other two R & D well fields (USMT field and 5I7 field). Under the extension of their commercial-scale license, WMC expects to be mining the USMT and 5I7 sites, and as a result, WMC wishes to hold off restoration of the fields until after the fields have been mined commercially. WMC's intention to mine and restore 5I7 and USMT during commercial operations was described in the WMC request for license renewal (dated February 5, 1980) and reconfirmed in a meeting between NRC and WMC on June 16, 1980.

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The proposed action is to renew the WMC R & D license for possession only at the USMT and 5I7 sites of the Irigaray claim. Under the renewal license, activities related to source and byproduct material would not be authorized at the remaining four, inactive claims that were covered by the original license. Although there will be no injection or recovery operations (except for restoration or control purposes) at the USMT and 5I7 sites, monitoring of the well fields will be maintained to assure contamination remains within the monitored well fields, and the evaporation ponds will be monitored to assure that timely action can be taken if a pond liner leaks. Restoration will be completed either after the fields are mined during commercial operations or before termination of this license.

Monitoring Activities at 5I7 and USMT

Since mid-1978, there has been no mining or restoration activity at either 5I7 or USMT. An ammonia transport study was conducted by WMC at the 5I7 site and has been the only activity within the well field since 1978. The ammonia transport study consisted mainly of measuring water level changes in the ore zone and taking water quality samples. In a letter dated November 16, 1979 (Docket No. 40-8502), the study results were summarized. Water level data showed little or no potential gradient for groundwater movement, and there was no detectable contamination from mid-1978 to June 1979 in all but one well, M-3. Well M-3, which appears to be contaminated and is outside the well field, is within 30 feet of a lixiviant injection well and may not represent post mining contaminant movement. Experience and modeling of in situ mine fields have shown that mine fluid may routinely move several tens of feet or more beyond the limits of the well field enroute from injection wells to production wells. The results of the chemical analyses of 5I7 field monitor wells M-1, M-2, M-3, M-4, M-5 are shown in Table 1. The results from the ammonia transport study are shown as the samples obtained in June 1979. Subsequent sampling (January 1980) shows possible contamination of wells M-1 and M-4 in addition to M-3. In a conversation with R. Kaufmann of the NRC on July 24, 1980, B. Ford of WMC said that WMC believes that over pumping of monitor wells has caused contaminated fluid to move out of the 5I7 field. Movement of contamination by over pumping, as described by B. Ford, is possible.

If the R & D license is renewed, there are wells available for monitoring groundwater to ensure that contamination does not move beyond the monitored well field areas. WMC in support of their license renewal request provided updated maps and well information for the 5I7 and USMT well

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fields in a submittal dated July 7, 1980 (correspondence from E. Tiepel of WMC to R. Kaufmann of NRC). The submittal maps show the three 5I7 well field patterns ringed by 6 monitor wells and the USMT pattern ringed by 4 monitor wells. All monitor wells are open to the ore zone horizon and within 85 feet of the well field patterns.

Solar Evaporation Ponds

There are four small evaporation ponds located at the 5I7 site shown in the WMC State permit application (dated April 12, 1978). The ponds vary in size but have a combined area of about 212,000 square feet, total capacity of 34 acre-feet, and a design embankment height of 6 feet. The ponds are lined with 30 mil nylon-reinforced hypalon. Below the liner of each pond is a network of perforated pipes that connect to an inspection tube standpipe. Samples will be taken from the standpipe once per week, and if a leak is detected, the fluid will be removed from the leaking pond and the leak repaired. Aside from monitoring of the two well fields, the solar evaporation ponds, and the ammonia transport studies, there has been no other activity at the site since termination of mining in 1978.

Staff Conclusions and Recommendations

1. Because there is no potential gradient for groundwater to move along, the contamination of well M-3 probably occurred during mining. In addition, it is the staff's conclusion that the contamination in wells M-1 and M-4 are probably the result of groundwater movement initiated by over pumping of the wells prior to sampling. The staff recommends that to ensure these conclusions are correct, the well fields be monitored for contaminant migration. As part of monitoring the well fields, the staff recommends that another monitor well should be drilled 50 feet east of M-3. To ensure that contaminant migration is not aggravated by monitoring, the staff recommends that no more than one casing volume be pumped from each well prior to monitoring.
2. Since there is no further mining planned or to be authorized by the renewed license at the 5I7 and USMT fields and there has been no measurable movement of contamination during the dormant condition of the fields aside from movement caused by sampling, there is no reason to insist that WMC clean up the R & D fields immediately.

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3. There is a sufficient number of monitor wells around 5I7 and USMT, with the addition of the one well mentioned above in item number 1, to detect any contamination that moves from the monitored well field areas.
4. Since there has been contamination of M-1, M-3, and M-4 and there is almost no data for monitor wells around USMT, the staff concludes that WMC will need to collect one round of samples to use to establish baseline for action levels. Analysis of baseline should be by the laboratory that is going to analyze monitor samples, EPA approved methods should be used and replicate analyses performed. Results of the baseline sampling and replicate analyses should be submitted to the NRC. Because of the lack of available water quality data, action levels will have to be set after the baseline data is submitted to the NRC.
5. The current pond monitoring program is sufficient.

Staff Recommended License Conditions

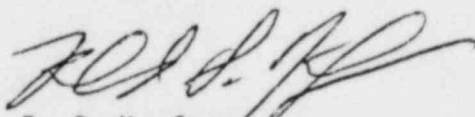
After review of the applicant's license application and supporting submittals, renewal of License SUA-1204 is recommended by the staff of WMUR. The staff further recommends that the license be renewed only for the 5I7 and USMT fields for possession only and with the following license conditions:

10. Authorized Use: For possession only of byproduct and source material in accordance with statements, representations and conditions contained in transmittals dated April 14, 1977; April 21, 1977; February 5, 1980; March 10, 1980; July 7, 1980; and Application for In Situ Permit to Mine for the Irigaray Site submitted to the State of Wyoming, dated April 12, 1978, Subsection 2.1.1 and Appendix E, "General Mine Plan" map. Notwithstanding the above, the following conditions shall override any conflicting statements contained in the licensee's application and supplements.
11. Activities shall be limited to the monitoring and restoration operations described in this license.
12. A monitor well shall be drilled fifty (50) feet east of well M-3. This new well shall be designated in all transmittals as NM-3. The drilling of NM-3 shall be completed within one month of granting of this license.

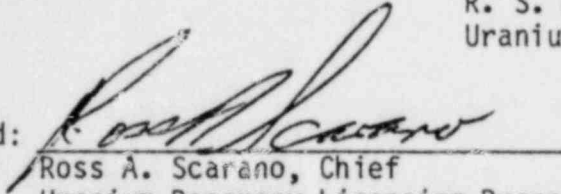
13. The licensee shall sample for baseline from Wells M-1, M-2, NM-3, M-3, M-4, M-5, M-6, M-218, M-219, M-220 and M-221 within one month of granting of this license. The samples shall be analyzed for uranium, ammonia, chloride, sulfate, conductivity, alkalinity, sodium and pH. The licensee shall have the laboratory work performed at the laboratory that will analyze the quarterly monitor samples specified in Condition 15 of this license. The laboratory should use EPA approved methods and be able to reproduce its own results. When analyzing baseline samples, the laboratory shall do one replicate analysis to demonstrate that the laboratory results are reproducible. If the laboratory is unable to replicate a sample and establish assurance of the reliability of the baseline results, the licensee shall either resample or use a different laboratory. Results of baseline and replicate analysis shall be submitted to the NRC for concurrence within six weeks of the granting of this license. Concurrence from the NRC will be demonstrated by a license amendment noting specific baseline parameters and action levels.
14. When taking groundwater samples, the licensee shall either pump only one well casing volume before sampling or create a hydraulic gradient toward the well field by pumping well field production wells just prior to sampling. This will assure that contamination from the well field is not drawn to the monitor well.
15. 517 test patterns 1-4 (pattern 4 is also referred to as "USMT site") shall be monitored for groundwater quality by the licensee. Monitor Wells M-1, M-2, NM-3, M-3, M-4, M-5, M-6, M-218, M-219, M-220, M-221, 211C, and 9, as shown in the maps of the site submitted with the correspondence dated July 7, 1980, shall be sampled once per quarter. Samples shall be chemically analyzed for uranium, ammonia, chloride, sulfate, conductivity, alkalinity, sodium, and pH.
16. The licensee shall notify the NRC immediately if any parameter from any sample exceeds action levels from Wells M-1, M-2, NM-3, M-3, M-4, M-5, M-6, or Wells M-218 through M-221. After notifying the NRC, the licensee shall resample any well(s) showing parameter values that exceed the action levels within 24 hours of first noting the condition. If, upon resampling, the parameter(s) value(s) remains beyond action levels, the affected well(s) shall be considered in excursion; and WMC shall take steps to correct the condition. WMC shall report the effects of corrective action in written form to the NRC monthly until the condition is corrected.
17. The licensee shall take samples from one of the evaporation ponds located in the 517 area twice a year. The sample should be chemically analyzed for uranium, ammonia, chloride, sulfate, conductivity and alkalinity.

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18. The licensee shall inspect the standpipes which monitor the unsaturated zone immediately beneath the pond liners at the evaporation ponds located at the 5I7 facility once every two weeks. If any fluid is found in the pipes, the NRC shall be notified immediately. If upon analysis, a sample of the standpipe liquid is found to be similar in quality to the contents of the pond indicating a leaky liner, the pond contents shall be transferred to an adjacent pond and the leak repaired.
19. The licensee shall file an annual report containing the results of all monitoring and an evaluation of the monitoring data discussing trends and anomalies that appear in the data. The first annual report shall be filed one year from the date of this license.
20. Restoration of the 5I7 patterns 1-4 and reclamation of evaporation ponds, plant site, and other areas of disturbed ground shall take place either in the course of fulfilling conditions of the licensee's commercial-scale License SUA-1341 (Docket 40-8502) or before expiration of this License (SUA-1204). Methods of restoration and reclamation shall be consistent with those described in License SUA-1341 and committed to by the licensee in the above mentioned March 10, 1980 submittal.



R. S. Kaufmann
Uranium Recovery Licensing Branch

Approved: 

Ross A. Scarano, Chief
Uranium Recovery Licensing Branch

Enclosure:
Table 1

Well No.	NH ₄		U ₃ O ₈		SO ₄		pH		Na		Specific Conductivity		Alkalinity		Cl	
	6/79	1/80	6/79	1/80	6/79	1/80	6/79	1/80	6/79	1/80	6/79	1/80	6/79	1/80	6/79	1/80
M-1	<.1	<.5	0.6	0.6	180	--		9.1	137	--	693	632	--	93	30	17
M-2	<.1	<.5	0.02	0.1	165	--	no field values available	8.9	125	--	640	604	--	129	16	10
M-3	0.6	14.7	1.1	0.4	135	--		8.3	125	--	708	1305	--	181	31	85
M-4	<.1	<.5	0.09	0.2	185	--		8.5	131	--	672	1065	--	131	20	35
M-5	<.1	<.5	0.03	0.1	187	--		9.2	130	--	672	634	--	83	17	13

The values of action parameters that have been found at the 517 site in samples obtained in June 1979 and January 1980. All units are expressed as parts per million except specific conductivity which is in $\mu\text{mho/cm}$.

Table 1