PDR Docket 40-8728

UNC TETON EXPLORATION DRILLING, INC.

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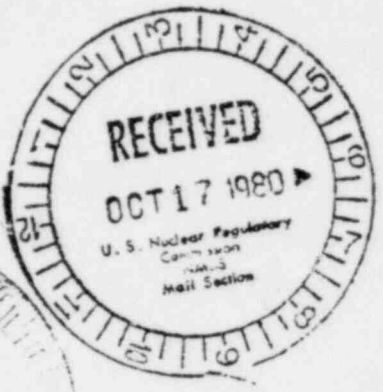
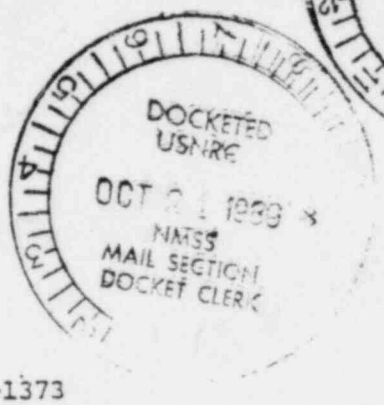
October 9, 1980





Mr. Ross Scarano
Uranium Recovery Licensing Branch
Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

and

Ms. Becky Mathison
Land Quality Division
Department of Environmental Quality
401 West Nineteenth Street
Cheyenne, WY 82001

RE: Source Material License SUA-1373
Docket Number 040-8778

and

Research and Development License 2RD

SUBJECT: Quarterly Report -- July 1, 1980 to September 30, 1980

Gentlemen:

In accordance with the reference Licenses, Teton-Nedco Joint Venture Partners herein presents the third Quarterly Report for its pilot in situ uranium mining operation in the Powder River Basin area of Wyoming. This report covers the period from July 1, 1980 through September 30, 1980.

All available information indicates that there have been no leach solution excursions and that radiation concentrations associated with the operations are within safe ranges and well below maximum allowable concentrations.

The well fields and process plant were shutdown from July 11, 1980 through August 5, 1980, to facilitate plumbing in of the new well patterns and testing the mechanical integrity of the production wells and flow lines.

1. Operational Summary

1.1 Mining

Teton-Nedco is in the third quarter of operation at its reserach and development in situ uranaium mine. The operations are proceeding reasonably close to schedule with no major problems.

We continued with the mining phase of the M ore zone and the early restoration phase of the N ore zone until July 11. At this time, the well fields and process plant went into a planned shutdown to allow for the necessary plumbing and wiring of additional five-spot patterns.

On August 5, the well fields and process plant went back into operation. However, due to recovery well pump problems, the well fields were not completely operational until August 10. Due to the long duration soak that was achieved by the shutdown, the uranium headgrade that was recovered from the M ore zone was greatly enhanced. This increase in uranium concentrations was of short duration, once mining was at full capacity.

Restoration of the N ore zone was continuing by blending water recovered from the N ore zone with the fresh water that was recovered from the M ore zone. This will allow for the removal of oxidant and leached uranium by dilution with untreated water.

This first phase of restoration was terminated on August 21, when the second phase of restoration began. The second phase consists of a groundwater sweep, which will continue until the concentrations of all lixiviant parameters approach the restoration goals that were established by the Wyoming Department of Environmental Quality or meet the criteria of WS 35-11-103 (f)(iii) and Chapter XIV, Section 2.d.(1) of the DEQ-LQD regulations.

On August 26, Teton-Nedco began using dissolved oxygen as an oxidant rather than hydrogen peroxide. We are evaluating this as a viable alternative to hydrogen peroxide in terms of oxidation efficiency and cost effectiveness.

Mining and restoration in the respective ore zones was continuing as of September 30, 1980.

1.2 Processing

As of July 25, two elutions had been completed which resulted in the precipitation and drumming of approximately 1000 pounds of uranium slurry. At this time, we utilized the ion exchange tails fluid for product

wash. This process redissolved minimal amount of uranium which was bled to the solar evaporation ponds. This process, however, helped to maintain product chloride levels at or below rejection specifications and reduced total plant bleed significantly.

In August, only 250 pounds of uranium oxide was fed to the ion exchange columns. Due to this small amount of mineral in the ion exchange columns, there was no need to do an elution.

During the month of September, the ion exchange columns were eluted twice which resulted in precipitation and drumming of approximately 925 pounds of product. Air agitation of the loaded ion exchange columns was tried to evaluate the resin stripping efficiency of this method. As yet, no qualitative data is available.

1.3 Well Fields

1.3.1 Well Field Flow Balance

Flow balance within the N and M well fields are listed in Table 1.3.1. Figure 1 shows the location of the injection and recovery wells used within the R&D License area. The net well field flow balance for the period covered by this report is tabulated below:

	N-Zone	M-ZONE
Injection (gallons)	1598560	5308560
Recovery (gallons)	3113642	5498008
Overrecovery (gallons)	1515082	189448
Overrecovery (percent)	48.7%	3.4%

1.3.2 New Well Field Patterns

All new wells have been drilled and completed by July 7. From July 11 through August 22, the new wells had been pump developed to clean-out residual drilling mud and packer tested to verify the mechanical integrity of the casing.

1.4 Waste Generation Volumes

The total volume of liquid waste effluent discharged from the process plant to the evaporation ponds during this reporting period is tabulated on the next page:

DATE	Volume in Gallons
July 1 through July 25, 1980	29368
July 26 through August 25, 1980	61950
August 26 through September 30, 1980	1813212

1.5 Solar Evaporation Pond Leak Detection System

As required by the referenced License, the standpipes of the pond leak detection system are being monitored for fluid every two weeks. The monitoring of these standpipes has shown nothing to indicate a leak in the liner of either solar evaporation pond.

The chemical constituents of fluid contained in the solar ponds are also monitored every two weeks. Table 1.5.2 and 1.5.3 list this monitoring data. Analyses for radionuclides normally requires six weeks to complete. These values will be reported to the regulatory authorities during the quarter that they are received from the laboratory. These results are listed in Table 1.5.4 and 1.5.5.

2. Lixiviant Migration Control

Lixiviant migration is controlled by the use of a pressure gradient that causes the lixiviant fluids to flow from areas of high fluid levels around injection wells to an area of low fluid levels around the recovery well. With reference to Table 1.3.1, Well Field Flow, it is evident that more fluid is recovered from the ore zone than is injected into the ore zone. The overrecovery is 48.7% for the N ore zone and 3.4% for the M ore zone. The percent overrecovery for the N ore zone includes the groundwater sweep. The overrecovery rates appear to alleviate any problems with lixiviant migration.

3. Monitor Well Water Analysis

Teton-Nedco excursion monitor wells were sampled for the full suite of D.E.Q. guideline 4 parameters between July 16 and July 23. Radium-226 analyses for the water samples collected in May are listed in Appendix A. The information from this quarter's water samples is listed in Appendix B.

These same wells are also sampled every two weeks for: Conductivity, Chloride, Sulfate, Uranium, Sodium and Alkalinity. The information form these samples is listed in Appendix C. By reviewing the information presented, it is evident that no excursions of leach solution have occurred during this reporting period.

During the second quarter reporting, Teton-Nedco made an unintentional procedural error by failing to notice that wells 314 and MM-2 had exceeded upper control limits on one or more sampling days. An additional error was made by failing to notify the proper agencies at this time. The concentration of uranium of these two wells did not increase, which might indicate that these wells did not exceed upper control limits due to leach solution excursions. By the time these anomalies were noticed, the parameters in question had already corrected themselves and dropped below their upper control limts.

Due to the numerous tasks that required attention at this time, we failed to sample well 304 on July 16 and August 15. The chemical results from certain wells have been misplaced during this time period. New procedures to correct such oversites have been instituted at the site. We do not anticipate any reccurence of these situations.

4. Hydrological Monitoring of Water Wells

The potentiometric levels of all monitor wells within the monitor well rings have been measured as required by the referenced Licenses. The results of the monitoring during this reporting period are listed in Appendix D. Barometric pressure during the monitoring periods are listed in Appendix D. Net well field flow rates during the monitoring periods are listed in Table 1.3.1.

5. Radiation Safety

The radiological monitoring program is being performed as outlined in the Environmental Report and Stipulation 30 of the N.R.C. License. Sampling points are those indicated in Figure III.2.1.02 of the Environmental Report and the Research and Development License Application.

Beta and Gama radiation was monitored once this quarter on July 9, 1980. The highest gross beta and gamma concentration was 0.274 mR/hr near the N Zone cuno filters. The lowest concentration was 0.067 mR/hr at the base of the precipitation tank. The non-processing area had concentrations no higher than 0.044 mR/hr with an overall average concentration of 0.129 mR/hr.

Swipe sampling to detect removable surface contaimination by Alpha emitting particulates in the plant area was conducted on a monthly basis. The average concentration for the plant building was 13.13 pCi/100 cm^2. The highest concentration for the plant was 176.8 pCi/100 cm^2 at the top of the chemical make-up tank. The lowest concentration was 0.25 pCi/100 cm^2 in the men's restroom.

Alpha radiation was monitored monthly with an average in-plant concentration of 3.80 pCi/L. The concentrations ranged from a low of 0.15 pCi/L in the men's restroom to a high of 62.04 pCi/L at the base of the IX columns.

Radon is also monitored monthly with an average concentration of 7.04 pCi/L. Concentrations ranged from a low of 0.02 pCi/L in the well field trailer to a high of 98.43 pCi/L at the sump grate.

Thermoluminescence dosimetry badges have been issued to all personnel. These badges are analyzed on a quarterly basis. The results from the second quarterly analysis have shown that all plant personnel have received radiation exposures well below maximum allowable concentrations.

Urine analysis for uranium concentrations in the plant personnel were conducted once per month. These results have also shown concentrations to be well below any level of concern.

On September 3, Nels Johnson from Eberline Instrument Corporation was on-site to conduct an audit of all aspects of the in-plant radiation protection program. His overall impression was favorable. He made suggestions on how we could make further improvements.

On September 4, our radiation monitoring equipment was sent to Eberline Instrument Corporation for recalibration. We received the equipment back of Setpember 19.

Sincerely,

TETON EXPLORATION DRILLING, INC.

Steven N. Rieger
Environmental Coordinator

Report Reviewed: Daniel M. Herlihy
Daniel M. Herlihy
Geohydrologist