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THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Department of Environmental Quality

LAND QUALITY DIVISION

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MEMORANDUM

TO FILE: Reno Creek, Rocky Mountain Energy TFN 1 4/192

FROM: Paula M. Schmittdiel, Hydrologist PMS

DATE: April 27, 1982

SUBJECT: Addendum to Memo of April 22, 1981 on Demonstrated Restoration Report-Pattern II

Several discrepancies in lab results between the two labs were noted in my memo of April 22, 1981. I discussed these discrepancies with Mike Newmann of RME in a phone conversation on April 21. He stated that he would have to check with the labs on their procedures before he could explain the discrepancies. On April 27, RME called with their findings on the discrepancies.

In most cases, the differences are due to different lab procedures or lab capabilities. Differences in pH values are due to NML reporting field values whereas CDM reported lab values. The differences in potassium values is due to a difference in lab procedures. NML uses a flame emission method to analyze for potassium whereas CDM uses the atomic adsorption method. Both methods are acceptable methods of analysis for potassium since there isn't any water quality standard for potassium. The difference in results should not be a major concern. The potassium values are within the baseline range.

The difference in lab results for analysis of trace metals (Cr, Cd, Mo Cu) is due to the lab capabilities at NML. The CDM lab has a graphite furnace which produces very precise analyses as oppose to NML where the methods only allow for ballpark estimates. Because of the relative 'imprecision' of NML analysis, their values are generally slightly higher. The results obtained by the CDM laboratory were higher than those obtained by the NML laboratory for uranium. RME feels confident that their results are more credible since their equipment and methods for uranium analysis are designed for a high level of precision. The high levels of selenium in the monitoring wells (Appendix A) for the October 1981 analyses is unexplain-

able. RME is checking into the lab procedures and is awaiting the results of further sampling (April 1982) at this time. In all likelihood, since the production and injection wells didn't show high levels of selenium in October 1981 and since selenium levels were never a problem before the results may have been due to lab error.

PMS:jsk
cc: Bill Kearney, LQD
Rick Chancellor, District IV
Dick Lennox, WQD

This review of the Demonstrated Restoration Report for Pattern II at Reno Creek In-Situ Leaching project will consist of a three part discussion on 1) baseline water quality; 2) restored water quality in the production & injection wells and monitoring wells; and 3) recommended action by the Department.

BASELINE WATER QUALITY

The overall water quality in the production zone is quite good - Class II (Chapter VIII, WQD Rules and Regulations). In many cases, the majority of the minor constituents were in the range of Class I water. Sulfate was consistently in the range of Class III Water (800-1100 mg/1). TDS was in the range of Class II water. The concentration levels of the other major constituents was in the range of Class II water or better. Vanadium exceeded Class II and Class III standards for baseline by 30 to 50 percent.

Baseline data was collected for the production wells - P - 10 and P - 11 and for the six monitoring wells - M-16, 17, 18, and 19, USM-20 and LSM-21. Bacause of the small area of the well field, it was felt that water quality would not differ significantly between the injection and the production wells. To establish restoration goals, baseline volumes for the production and monitoring wells were averaged together. Five to six samples were taken during the baseline period for the major constituents, while two to four samples were taken for minor constituents. One monitoring well each was placed in the upper sand unit and lower sand unit at the well field. These wells were monitored 2 to 4 times during baseline. Because of the lack of water in the upper sand unit, this well was only sampled twice. During restoration, the well did not produce enough water to obtain a water sample.

RESTORED WATER QUALITY IN THE PRODUCTION AND INJECTION WELLS

The water qulaity in the production zone has been restored to baseline or better for all constituents except uranium, vanadium, and pH. The pH levels were slightly below baseline (7.8-8.1 compared to 8.2-8.9) but were within the range for Class I and Class II standards. The major constituents analyzed: bicarbonate, carbonate, alkalinity, calcium, chloride, magnesium, potassium, sodium, sulfate and total dissolved solids have returned to baseline range (see Tables III, IIIA, IV and IVA). Potassium was consistently higher for NML Laboratory than the values reported by the CDM Laboratory. Chloride and magnesium showed slightly elevated levels in the 4/16/81 sample. These concentrations were not significant and were within the baseline range for the 10/12/81 samples. All minor constituents were returned to baseline with the exception of vanadium. Vanadium exceeded the upper baseline range (0.34 mg/1) by almost fifty percent in the 4/16/81 samples. The concentration levels dropped slightly for the 10/12/81 samples but were still above baseline. The chromium values obtained by the NML were higher than those values obtained by the CDM Laboratory although the October analysis was within the baseline range.

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The radio chemistry analytical results indicated uranium has not returned to baseline range although as of October, 1981 the reported concentrations were within the standards for Class II water WQD Rules and Regulations. The general trend of the analytical results indicates that the concentration of uranium is increasing (see Table V and Figure 7). The results obtained by the CDM Laboratory were higher than those obtained by NML Laboratory for uranium, but in both cases the results exceeded baseline. Thorium-230 shows a pattern similar to uranium.

RECOMMENDED ACTION

The groundwater quality at Pattern II Site has been restored with the exception of vanadium and uranium which still show concentration levels above the range of baseline. It is recommended that the Department request two additional samples and uranium analysis before considering wnether or not restoration has been completed. At this time, RME has collected two quarterly samples since October, 1981 which they will be submitting shortly, per my phone conversation with Mike Neumann on April 21, 1982.

PMS:vjm
cc: Dick Lennox, WQD
Rick Chancellor, District IV
Bill Kearney, LQD