EG&G Idaho

INTEROFFICE CORRESPONDENCE

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to   D. Goldman

from   R. E. McAtee   *REM*

subject   RAFT RIVER PRODUCTION TEST PLAN TO FLOW WELL #2, INJECTION INTO WELL #6, FOR 72 HOURS, FET-22C-78 - REM-17-79

The hydrochemical results for Test FET-22C-78 are attached. This information is to be included in the final report of the test.

SW

Attachment:
As Stated

cc: C. A. Allen
       D. W. Allman
       B. S. Meyer
       S. G. Spencer
       Central File

RESULTS OF RAFT RIVER PRODUCTION TEST TO
FLOW WELL RRGE-2, INJECTING INTO WELL
RRGI-6 FOR 72 HOURS, FET-22C-78

R. E. McAtee
B. S. Meyer

INTRODUCTION

The chemical testing of the production test, FET-22C-78, included sampling well RRGE-2 water at approximately 8-hour intervals, determining the total suspended solids (TSS) injected into well RRGI-6, and continuous monitoring of the flow water for pH, oxidation-reduction potential, and conductivity. Samples collected at the 8-hour intervals were analyzed for pH, conductivity, hardness, sodium, alkalinity, chloride, and fluoride concentrations. Failure of the in-line pH and oxidation-reduction potential probes during the pre-testing required these analyses be deleted from the test. The 8-hour water samples and the in-line conductivity probe were used to determine if or when chemical changes took place during the test.

PURPOSE

Primarily the test was designed to check out hardware and instrumentation and to define pump requirements for long-term testing. Hydrochemical information obtained from the test will provide the chemical composition of the water from well RRGE-2 and the TSS injected into well RRGI-6. This report will be concerned with the hydrochemistry only.

EXPERIMENTAL PROCEDURE

One-liter water samples from well RRGE-2 were collected at RRGI-6 at 8-hour intervals. These samples were analyzed for pH, conductivity, hardness, sodium, alkalinity, chloride, and fluoride. In-line pH, oxidation-reduction potential and conductivity probes were installed on the flow line at RRGI-6 to continuously monitor water composition. Samples of 20 liters of well RRGE-2 water were filtered through a 2-micron sintered stainless-steel filter. The filter samples were taken at RRGI-6.

DATA EVALUATION

Table I shows the average values for the chemical species of the water samples taken at the 8-hour intervals.

TABLE I

	pH	Conduc- tivity	Hardness	Alka- linity	Na^+	F^-	Cl^-
$\bar{X}$	7.7	2345	104	41.7	426	8.7	668
S_{X_i}	±0.3	±69	±8	±4.9	±32	±0.5	±61
$\%S_{X_i}$	±4.1	±2.9	±7.5	±11.9	±7.5	±5.4	±9.0

Note: All concentrations are in mg/l except conductivity which is in μs.
$\bar{X}$ average value
S_{X_i} standard deviation for a single value
$\%S_{X_i}$ percent standard deviation for a single value

The data scatter for the 72-hour test was random and no trends in chemical change were observed. This evaluation is further supported by the results of the in-line conductivity probe for which no change in conductivity was detected during the test.

Figure 1 shows the results of the filter test. Along with approximately 13,000 m^3 of water, 7.5 kg of TSS were injected into RRGI-6. This test did show an increase in the weight of TSS as the test progressed.

CONCLUSION

The 72-hour flow for well RRGE-2 resulted in a total volume of 13,000 m^3 of water flowed. This was more than adequate to stabilize wellbore tempera- ture and insure chemical equilibrium. No trends in chemical change were observed in either the routine 8-hour samples or the conductivity from the in-line conductivity probe. The filter test results showed the weight of TSS

injected into well RRGI-6 to be 7.5 kg. However, TSS increased from $\simeq$ 0.2 mg/l to > 1.0 mg/l during the test. This could be from either wellbore or flow line erosion. The filter test will be designed to determine the source of the TSS in the long-term RRGE-2 production/RRGI-6 injection test.

Figure 1

Flow (l/m)

Total Suspended Solids (mg/l)

Time (hrs)

Flow rate

Suspended solids

Average value, used to determine total suspended solids

Total volume of water — 13,000 m³ (3.47 × 10⁶ gal)

Total weight of solids — 7.5 kg (16.5 lbs)