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Docket # 40-8697

**ROCKY MOUNTAIN
ENERGY COMPANY**

PDR

U. S. Nuclear Regulatory Commission
Division of ~~Well~~ ^{Drill} & Material Safety
Washington, D. C. 20555

Dear Sir:

RE: License SUA-1338
Docket No. 40-8697

Pursuant to Condition No. 14 of the referenced Source Material License, Rocky Mountain Energy (RME) is providing written notification that restoration of Pattern 2 at our Reno Creek ISL test facility has commenced.

Restoration of the test pattern began December 22, 1980 when chemical reformation of lixiviant was discontinued. Circulation of production fluid through the wellfield and the processing plant to lower uranium concentrations began.

The restoration method described in the carbonate Amendment Request (see Drawing No. RC-P-05-003) of April, 1980, proposed the use of a water pre-treatment step followed by reverse osmosis (R.O.) to reduce TDS concentration and produce a product (R.O. permeate) suitable for reinjection.

During the initial phase of restoration, it was suggested that pre-treatment of the production fluid by an ion exchange process prior to R.O. would greatly speed restoration. Accordingly, I.X. columns were prepared to strip divalent cations from the production fluid by means of a weak acid resin. Evaluation of the effectiveness of this treatment method indicated that the ion exchange process was performing well enough to eliminate the need for treatment by P.O. Revised Drawing No. RC-P-05-005 shows the general restoration process used.

Restoration using the ion exchange resin began on February 17, 1981. Table I describes production fluid water quality prior to initiation of ion exchange treatment. Circulation of production fluid from the pattern through the I.X. columns at an average flow rate of 23 gpm continued until March 13. During this period, a total of 828,000 gallons (approximately 3.1 pore volumes) were produced while 720,000 gallons (approximately 2.7 pore volumes) were reinjected, giving a net consumptive groundwater use of 108,000 gallons. Table II describes production fluid water quality at the end of this restoration phase.

Analysis of restoration progress as represented by Table II water quality shows that the groundwater affected during leaching had been restored to background ranges or below drinking water standards for the major parameters. Because of the relatively low concentrations of uranium and vanadium, further reduction of these levels by means of I.X. or R.O. is not feasible. Ion concentrations are too low to provide sufficient driving force for exchange reactions to occur. Therefore, an attempt to reduce uranium and vanadium levels by means of a formation groundwater sweep was begun on March 13.

21/L1

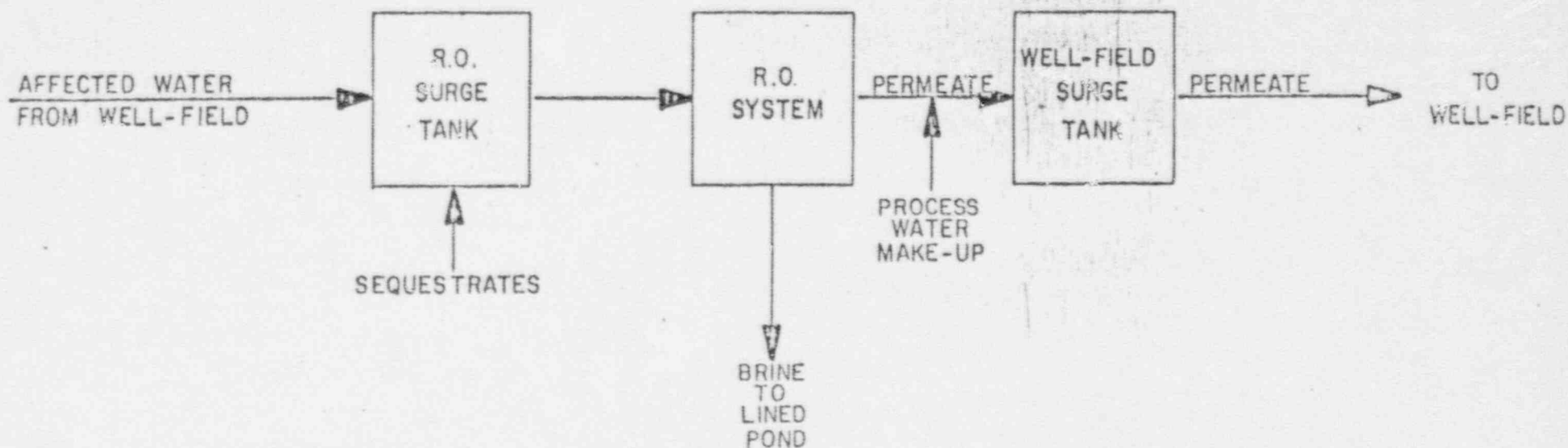
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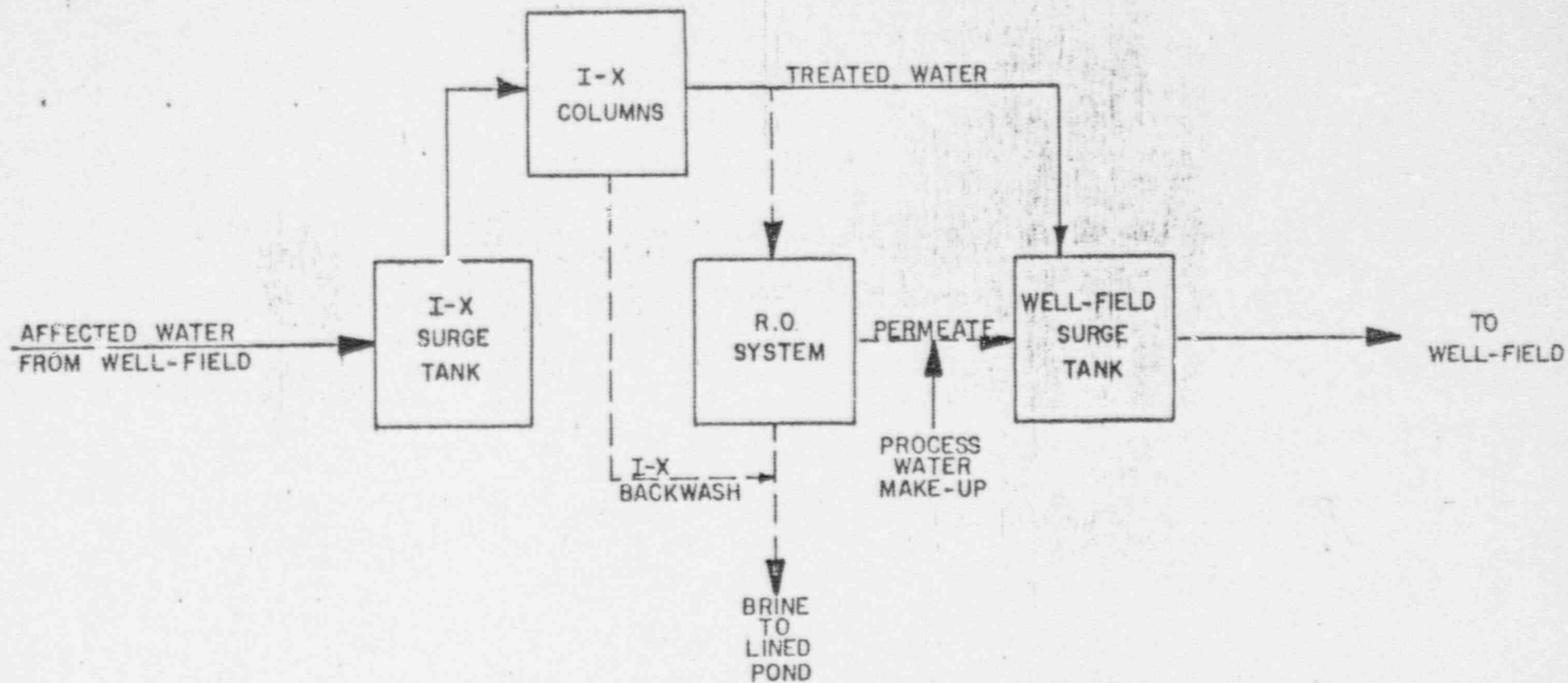
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CARBONATE RESTORATION CIRCUIT



CARBONATE RESTORATION CIRCUIT (REVISED)

PATTERN II - RENO CREEK

TABLE I
RENO CREEK PATTERN II
PRODUCTION FLUID WATER QUALITY
FEBRUARY 9, 1981

<u>Parameter</u> ¹	<u>Baseline</u> ² <u>Range</u>	<u>Well P-10</u>	<u>Well P-11</u>
pH	8.2-8.9	7.57	7.47
TDS	1340-1580	2320	2280
HCO ₃	89-178	390	400
Ca	108-153	128	125
Cl	7.0-18.8	74	74
Na	287-360	504	494
SO ₄	818-1002	1311	1320
Fe	0.03-0.61	0.07	0.07
U ₃ O ₈	0.012-0.287	13.8	16.1
V	0.05-0.34	0.6	1.0
Ra 226*	106-768	191	432

¹All values expressed as mg/l except pH (standard units) and Ra 226 (pCi/l).

²Baseline range is for all Pattern II wells following removal of outlying data points.

* Radium and TDS values are from 1/19/81 sampling.

TABLE II
 PENO CREEK PATTERN II
 PRODUCTION FLUID WATER QUALITY
 MARCH 9, 1981

<u>Parameter</u> ¹	<u>Baseline</u> ² <u>Range</u>	<u>Well P-10</u>	<u>Well P-11</u>
pH	8.2-8.9	7.50	7.49
TDS	1340-1580	1560	1520
HCO ₃	89-178	130	130
Ca	108-153	75	85
Cl	7.0-18.8	60	53
Na	287-360	341	339
SO ₄	818-1002	1141	1140
Fe	0.03-0.61	0.03	0.03
U ₃ O ₈	0.012-0.287	1.61	0.26
V	0.05-0.34	0.4	0.6
Ra 226*	106-768	*	*

¹ All values expressed as mg/l except pH (standard units) and Ra 226 (pCi/l).

² Baseline range is for all Pattern II wells following removal of outlying data points.

* Analysis pending.

Presently, the groundwater sweep is continuing at a flow rate of approximately 25 gpm. Analysis of current production fluid water quality indicates that little improvement in groundwater quality has resulted from this restoration phase. In fact, there is evidence to suggest that introduction of "fresh" formation water is recreating an oxidizing environment, causing mobilization of some metals to occur.

Assuming that the sweeping activity is resulting in remobilization of undesirable groundwater constituents rather than elimination or reduction of those elements, it seems prudent to discontinue sweep efforts. Unless significant improvement in Pattern II water quality is observed in the immediate future, the sweep will be discontinued and the pattern shut down in order to demonstrate restoration stability.

As stated in Condition No. 33 of License SUA-1338, the goal of the restoration program is the return of all parameters to preinjection background levels. As provided in Wyoming Department of Environmental Quality regulations, should restoration of all parameters to background levels be impracticable, the condition and quality of the affected groundwater will be returned to a quality of use equal to and consistent with prior use suitability.

The stability of the restored test pattern will be verified by monthly sampling of the two production wells, P-10 and P-11, and the pattern monitor wells. Samples will be collected and analyzed for the full suite of parameters listed on Page 10 of the April, 1980 Amendment Request (See Attachment A) at the beginning and end of the six-month stabilization period. Samples collected during the interim four-month period will be analyzed for pH, conductivity, TDS, bicarbonate, chloride, uranium, and vanadium.

It is anticipated that restoration activities will be discontinued within the month. Upon termination of restoration activities, a preliminary restoration report summarizing water quality status will be provided to NRC and Wyoming DEQ personnel. A final restoration report will be prepared at the close of the six-month demonstrated stability period.

If you have any questions concerning this report, please don't hesitate to call me at (307) 237-8326.

Sincerely,

Michael R. Neumann

Michael R. Neumann
Field Environmental Coordinator

MRN/pa

Attachments

cc: Mr. Fred Ross, NRC
Margery Hulburt (DEQ)
Tony Mancini (DEQ)
Richard Chancellor (DEQ)
Tom Mueller (DEQ)
D. S. Gardner (RMEC)
R. E. Hynes (RMEC)
J. A. Yopps (RMEC)
J. A. Yellich (RMEC)
8.01-4 RC

21/L2

ATTACHMENT A

pH	Aluminum	Molybdenum
Alkalinity	Arsenic	Vanadium
Conductivity	Barium	Radium-226
Bicarbonate	Cadmium	Thorium-230
Carbonate	Chromium	Uranium
Calcium	Copper	Total Dissolved Solids
Chloride	Iron	
Boron	Lead	
Fluoride	Manganese	
Magnesium	Mercury	
Potassium	Nickel	
Sodium	Selenium	
Sulfate	Zinc	