



ROCKY MOUNTAIN ENERGY

A Subsidiary of
Union Pacific Corporation

40-8380

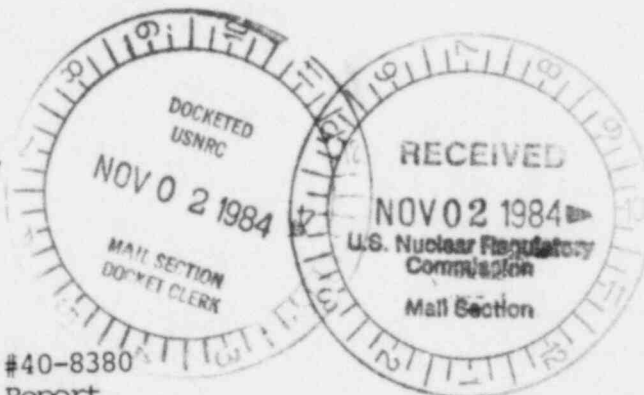
RETURN TO URFO - DENVER, PDR

October 31, 1984

Mr. R. Dale Smith
U. S. Nuclear Regulatory Commission
Uranium Recovery Field Office, Region IV
Box 25325
Denver, Colorado 80225

Dear Mr. Smith:

Re: License SUA-1228, Docket #40-8380
Nine Mile Lake Quarterly Report
Third Quarter, 1984



In compliance with license condition 36, a quarterly report summarizing environmental surveillance at the Nine Mile Lake R & D project is hereby submitted. This report covers the period July 1, 1984 through September 30, 1984.

OPERATIONS

Leaching circuits have been inactive since Fall of 1981. Restoration efforts were halted February 1, 1982. Activities at the Nine Mile Lake R & D project since February, 1982 have been limited to environmental surveillance and site maintenance.

ENVIRONMENTAL MONITORING

Groundwater

Nine Mile Lake groundwater analyses for the third quarter are shown in Tables 1-4. Only Pattern 3, an acid leach test, and Pattern 4, a carbonate-leach test, were sampled.

Restoration reports have been submitted to the NRC and Wyoming DEQ for review. Comments as to restoration adequacy of the carbonate test pattern are expected from both agencies in the near future.

Air Quality

Second quarter, 1984 radionuclide particulate data are listed in Table 5. All results from upwind, downwind and process building locations are significantly less than 10 CFR 20 limits.

Tables 6 and 7 display radon gas and radon progeny values for the third quarter, all of which are below 10 CFR 20 limits.

Area dosimetry data are shown in Table 8. All locations are well within acceptable exposure levels.

Removable alpha surveys are conducted once per quarter at selected work places. Table 9 shows third quarter results all of which are well under the limit of 1000dpm/100cm².

DESIGNATED ORIGINAL

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FEE EXEMPT
01537

Reservoir Data

All solution has evaporated from both reservoirs. Measures were taken during the third quarter to control dust on Reservoir A.

PROPOSED ACTIVITIES

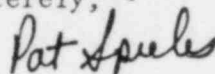
At this time no further research and development nor plans for commercialization is contemplated for the Nine Mile Lake Project.

Facility decommissioning, starting with well abandonment, will commence upon receiving formal approval from NRC and the Wyoming DEQ.

Required environmental monitoring plus other appropriate surveillance will continue through decommissioning.

If you have questions, please call me at the Casper office or Mike Neumann in our Broomfield office.

Sincerely,



Patrick Spieles
Facility Superintendent

Attachments

cc: K. Peterson, NRC
NRC, Region IV
NRC, Document Management Branch
Roy Spears (DEQ, District I)
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TABLE 4
NINE MILE LAKE
PATTERN 4 QUARTERLY WELL DATA
THIRD QUARTER, 1984

	PATTERN BASELINE RANGE	M-54 8/8/84	M-55 8/8/84	M-56 8/8/84	M-57 8/8/84	I-60 8/8/84	P-62 8/8/84
pH	6.4-6.8	6.4	6.7	6.7	6.7	6.9	6.7
Conductivity	5500-7500	10400	2000	1560	2000	6600	3975
<u>MAJOR CONSTITUENTS</u>							
Bicarbonate	254-291	345	265	204	259	357	305
Carbonate	0	0	0	0	0	0	0
Alkalinity as CaCO ₃ eq.	208-239	283	217	167	212	293	250
Calcium	190-282	372	75	38	74	245	150
Chloride	60-118	136	33	20	37	92	63
Magnesium	100-144	133	44	20	43	121	76
Potassium	10-14	19.4	8.6	7.0	8.8	13.8	11.2
Sodium	1107-1709	2402	499	289	537	1534	946
Sulfate	3133-4601	6594	1137	608	1240	4243	2570
TDS	5260-6520	9560	2060	1140	2200	6520	3880
Anion/Cation Balance		96	101	99	100	96	96
<u>MINOR CONSTITUENTS</u>							
Arsenic	0.024-0.050	0.002	0.004	0.002	0.003	0.001	0.001
Iron	0.4-2.7	0.74	0.23	0.05	0.09	0.20	0.10
Selenium	0.002-0.18	0.002	0.040	0.200	0.015	0.397	0.452
Vanadium	0.02-0.15	0.081	0.027	0.392	0.246	1.300	0.770
<u>RADIOCHEMISTRY</u>							
Uranium (U ₃ O ₈)	0.063-0.165	1.007	0.281	0.085	0.086	0.864	0.333
Radium-226	270-520	1064	152	50	52	199	123

Note: All units expressed in mg/l (ppm) except conductivity (µmhos/cm), pH (standard units) and Ra-226 (pCi/l).

TABLE 3
NINE MILE LAKE
PATTERN 4 MONTHLY WELL DATA
THIRD QUARTER, 1984

		<u>pH</u>	<u>CONDUCTIVITY</u> <u>µmhos/cm</u>	<u>CHLORIDE</u> <u>mg/l</u>	<u>BICARBONATE</u> <u>mg/l</u>	<u>URANIUM (U₃O₈)</u> <u>mg/l</u>	<u>CALCIUM</u> <u>mg/l</u>	<u>VANADIUM</u> <u>mg/l</u>
PATTERN BASELINE RANGE		6.3-7.1	2400-2900	32-52	254-333	0.04-0.39	57-112	ND-0.32
P-62	July, 1984	6.9	5000	61	310	0.538	149	0.483
	Aug, 1984	6.7	3975	63	305	0.333	150	0.770
	Sept, 1984	6.8	3500	66	320	0.572	172	0.818
M-54	UCL	7.5	8413	130	322	1.040	329	0.16
	July, 1984	6.5	11250	126	343	1.040	363	0.032
	Aug, 1984	6.4	10400	136	345	1.007	372	0.081
	Sept, 1984	6.4	10000	161	343	0.991	383	0.087
M-55	UCL	7.8	3285	59	380	0.464	133	0.08
	July, 1984	6.7	2000	36	272	0.334	72	0.003
	Aug, 1984	6.7	2000	33	265	0.281	75	0.027
	Sept, 1984	6.8	3000	37	265	0.314	86	0.027
M-56	UCL	7.6	3080	57	373	0.183	107	0.37
	July, 1984	7.0	1550	27	194	0.089	37	0.281
	Aug, 1984	6.7	1560	20	204	0.085	38	0.392
	Sept, 1984	7.1	1900	23	191	0.095	38	0.410
M-57	UCL	7.8	3218	61	373	0.150	112	0.34
	July, 1984	6.7	2000	38	258	0.099	72	0.138
	Aug, 1984	6.7	2000	37	259	0.086	74	0.246
	Sept, 1984	6.9	2250	36	262	0.096	80	0.238
I-60	UCL							
	July, 1984	6.8	6200	74	343	0.686	223	0.227
	Aug, 1984	6.9	6600	92	357	0.864	245	1.300
	Sept, 1984	6.9	5250	93	375	0.989	266	0.989

TABLE 2
NINE MILE LAKE
PATTERN 3 QUARTERLY WELL DATA
THIRD QUARTER, 1984

	PATTERN BASELINE RANGE	M-40 8/1/84	M-41 8/1/84	M-42 8/1/84	M-43 8/1/84	I-46 8/1/84	P-50 8/1/84	P-53 8/1/84
pH	6.4-7.6	7.1	6.6	6.7	6.9	6.3	6.6	5.8
CONDUCTIVITY	1200-3500	1700	1850	2800	2900	1780	1640	1795
<u>MAJOR CONSTITUENTS</u>								
BICARBONATE	176-507	207	188	287	307	122	145	66
CARBONATE	0-0	0	0	0	0	0	0	0
ALKALINITY AS CaCO_3 eq.	144-416	170	154	235	252	100	119	54
CALCIUM	41-135	40	48	79	94	50	47	34
CHLORIDE	20-25	20	25	33	34	24	25	25
MAGNESIUM	13-71	25	27	48	50	27	21	20
POTASSIUM	5.9-16.0	5.1	7.5	9.7	10.0	9.6	6.6	7.3
SODIUM	310-863	277	345	484	488	290	275	308
SULFATE	628-2826	620	817	1166	1233	752	689	778
TDS	880-3320	1060	1300	2020	2140	1280	1160	1300
ANION/CATION BALANCE		98	98	99	98	98	97	97
<u>MINOR CONSTITUENTS</u>								
ARSENIC		0.001	0.002	0.002	0.002	0.024	0.009	0.033
IRON	0.01-4.10	0.21	0.25	0.33	0.28	0.52	0.58	2.94
SELENIUM		0.018	0.008	0.016	0.009	0.019	0.001	0.003
VANADIUM	0.01-0.45	0.134	0.332	0.094	0.132	0.252	0.432	0.500
<u>RADIOCHEMISTRY</u>								
URANIUM (U_3O_8)	0.001-0.200	0.052	0.020	0.048	0.358	0.005	0.042	0.015
RADIUM-226	1.5-274	26	31	62	140	361	556	503

NOTE: All units expressed in mg/l (ppm) except conductivity (umhos/cm), pH standard units and Ra-226 (pCi/l).

TABLE 1
NINE MILE LAKE
PATTERN 3 MONTHLY WELL DATA
THIRD QUARTER, 1984

PATTERN BASELINE RANGE		pH 6.4-7.6	CONDUCTIVITY $\mu\text{mhos/cm}$ 1200-3500	BICARBONATE mg/l 176-507	SULFATE mg/l 628-2826	CALCIUM mg/l 41-135	IRON mg/l 0.1-4.1	URANIUM (U_3O_8) mg/l 0.002-0.20
P-50	July, 1984	6.2	1550	105	601	35	0.45	0.037
	Aug, 1984	6.6	1640	145	689	47	0.58	0.031
	Sept, 1984	6.2	1550	104	681	34	0.62	0.029
P-53	July, 1984	5.6	1750	52	788	35	2.96	0.014
	Aug, 1984	5.8	1795	66	778	34	2.94	0.015
	Sept, 1984	5.7	1700	52	700	38	2.91	0.377
M-40	July, 1984	7.1	1640	195	592	44	0.13	0.038
	Aug, 1984	7.1	1700	207	620	40	0.21	0.052
	Sept, 1984	7.1	1650	203	555	44	0.13	0.050
M-41	July, 1984	6.6	1950	192	797	50	0.14	0.018
	Aug, 1984	6.6	1850	188	817	48	0.25	0.0020
	Sept, 1984	6.7	1850	188	687	52	0.12	0.032
M-42	July, 1984	6.6	2900	272	1207	77	0.22	0.043
	Aug, 1984	6.7	2800	287	1166	79	0.33	0.048
	Sept, 1984	6.7	2850	285	1016	81	0.20	0.046
M-43	July, 1984	6.8	3000	237	1266	90	0.21	0.318
	Aug, 1984	6.9	2900	307	1233	94	0.28	0.358
	Sept, 1984	6.9	2900	297	1093	95	0.22	0.309
I-46	July, 1984	6.2	1850	107	827	50	0.37	0.001
	Aug, 1984	6.3	1780	122	752	50	0.52	0.005
	Sept, 1984	6.2	1750	110	824	55	0.32	0.002

TABLE 5
RADIOMETRIC AIR PARTICULATE
NINE MILE LAKE
SECOND QUARTER, 1984

<u>Air Particulates</u>		-----10 ⁻¹⁶ μ Ci/ml-----		
<u>Site</u>		<u>Ra-226</u>	<u>Th-230</u>	<u>Uranium</u>
Upwind Control (#5)*		5.3 \pm 4.5	3.3 \pm 1.3	2.4
Downwind Boundary (#3) ^w		5.0 \pm 4.6	5.5 \pm 1.6	2.4
Inside Process Building (#4)**		15.0 \pm 7.0	6.8 \pm 1.8	12.0
* 10 CFR 20 Limit (unrestricted area)		2 x 10 ⁻¹²	8 x 10 ⁻¹⁴	3 x 10 ⁻¹²
** 10 CFR 20 Limit (restricted area)		3 x 10 ⁻¹¹	2 x 10 ⁻¹²	7 x 10 ⁻¹¹

TABLE 6
RADON GAS
NINE MILE LAKE
THIRD QUARTER, 1984

<u>Site</u>		<u>Rn-222 ($\mu\text{Ci/ml} \times 10^{-9}$)</u>
Upwind Control (#5)*	July, 1984	0.51 \pm 1.12
	Aug, 1984	0.61 \pm 0.69
	Sept, 1984	0.92 \pm 0.51
Downwind Boundary (#3)*	July, 1984	0.00 \pm 0.61
	Aug, 1984	0.00 \pm 0.49
	Sept, 1984	1.55 \pm 0.60
Downwind Boundary (#3B)*	July, 1984	0.00 \pm 1.13
	Aug, 1984	0.34 \pm 0.52
	Sept, 1984	1.01 \pm 0.53
Process Building** Upper Deck	July, 1984	2.40 \pm 1.08
	Aug, 1984	0.73 \pm 0.47
	Sept, 1984	0.45 \pm 0.38
Process Building** Lower Deck	July, 1984	1.25 \pm 1.131
	Aug, 1984	0.21 \pm 0.54
	Sept, 1984	0.19 \pm 0.52
* 10 CFR 20 Limit	(unrestricted area)	$3.00 \times 10^{-9} \mu\text{Ci/ml}$
** 10 CFR 20 Limit	(restricted area)	$3.00 \times 10^{-8} \mu\text{Ci/ml}$

TABLE 7
RADON DAUGHTERS
NINE MILE LAKE
THIRD QUARTER, 1984

<u>SITE</u>	<u>WORKING LEVEL</u>		
	<u>JULY</u>	<u>AUG</u>	<u>SEPT</u>
Surface Discharge Surge Tank	0.035	0.019	0.011
Upper Deck	0.010	0.035	0.001
Lower Deck	<0.001	0.014	0.002
Sump Pump	0.019	0.026	0.005
R/O Unit	0.002	0.010	0.003
Assay Station	<0.001	0.003	0.006
Lunch Room	0.012	0.025	0.001
Water Lab	0.008	0.036	0.001
Radiation Lab	<0.001	0.014	0.002
Security Office	0.002	0.035	0.007
Superintendent's Office	0.006	0.017	0.001
Storage Loft	<0.001	0.025	0.001
Detection Limit	0.001 WL		
10 CFR 20 Limit	0.3 WL		

TABLE 8
 AREA DOSIMETRY*
 NINE MILE LAKE
 THIRD QUARTER, 1984

<u>SITE</u>	<u>MREM/QUARTER</u>
Upwind Control	21.29
Pattern 1	26.29
Pattern 2	31.28
Pattern 3	25.23
Pattern 4	26.29
Downwind Boundary-Site 3	30.49
Downwind Boundary-Site 3B	24.97
Lower Deck	31.81
Upper Deck	46.92
Water Lab	22.08
Superintendent's Office	31.67
Radiation Lab	20.63
Security Office	25.76
Lunchroom	25.63
Assay Station	21.82

*Dosimetry service performed by Eberline.

Badges are exchanged quarterly.

TABLE 9
 QUARTERLY ALPHA SURVEY
 NINE MILE LAKE
 THIRD QUARTER, 1984

<u>SITE</u>	TOTAL REMOVABLE ALPHA
	<u>dpm/100cm²</u>
Water Lab	9.4
Radiation Lab	44.7
Assay Station	63.5
Lunch Room	14.1
Security Office	37.6
Work Bench	47.0
Superintendent's Office	30.6
Limit for removable alpha	1000