



**ROCKY MOUNTAIN
ENERGY**

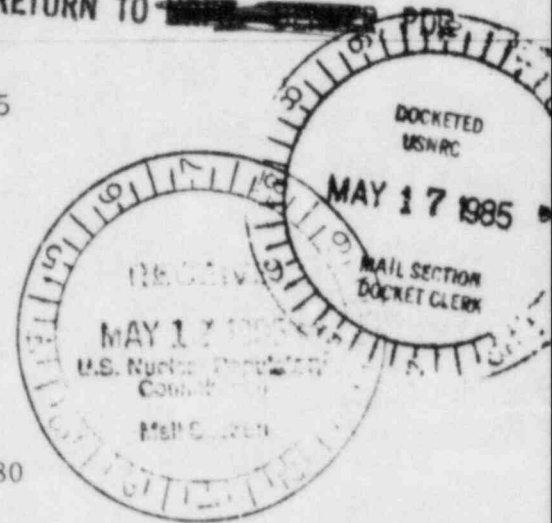
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A Subsidiary of
Union Pacific Corporation

May 14, 1985

RETURN TO ~~██████████~~ PDR

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



Dear Mr. Smith:

RE: License SUA-1228, Docket #40-8380
Nine Mile Lake Quarterly Report
First Quarter, 1985

Pursuant to license condition 36, this quarterly report summarizing environmental surveillance at the Nine Mile Lake R & D project is submitted. The report covers the period January 1, 1985 through March 31, 1985.

OPERATIONS

Leaching circuits have been inactive since Fall of 1981. Restoration efforts were halted February 1, 1982. Site 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 first quarter are shown in Tables 1-4. Pattern 3, an acid leach test, and Pattern 4, a carbonate-leach test, were sampled on a monthly frequency.

Air Quality

Fourth 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 show radon gas and radon progeny values for the fourth 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 displays first quarter samplings, all of which are well under the limit of 1000dpm/100cm².

DESIGNATED ORIGINAL

Certified By Mary C. Hood

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C PDR

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Reservoir Data

All solution has evaporated from both reservoirs. Measures have been taken to control dust on Reservoir A.

PROPOSED ACTIVITIES

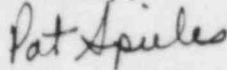
At this time no further research and development nor plans for commercialization is contemplated for the Nine Mile Lake Project.

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: E. Hawkins, NRC
NRC, Region IV
NRC, Document Management Branch
Roy Spears, (DEQ, District I)
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TABLE 1
NINE MILE LAKE
PATTERN 3 MONTHLY WELL DATA
FIRST QUARTER, 1985

PATTERN BASELINE RANGE		pH 6.4-7.6	CONDUCTIVITY μ 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	Jan, 1985	6.4	1974	111	716	52	0.54	0.029
	Feb, 1985	6.5	1676	97	629	44	0.60	0.065
	Mar, 1985	6.5	1735	136	780	51	0.57	0.071
P-53	Jan, 1985	5.4	1974	44	736	34	2.5	0.046
	Feb, 1985	5.6	1868	39	753	34	2.5	0.026
	Mar, 1985	5.7	1633	53	816	37	2.8	0.062
M-40	Jan, 1985	7.2	1960	181	641	43	0.61	0.012
	Feb, 1985	7.1	1703	192	680	37	0.14	0.039
	Mar, 1985	7.1	1530	203	648	42	0.25	0.039
M-41	Jan, 1985	6.6	2302	165	808	52	0.26	< 0.001
	Feb, 1985	6.8	2242	166	877	56	0.14	0.016
	Mar, 1985	6.7	2040	186	870	57	0.14	0.005
M-42	Jan, 1985	6.8	3289	255	1235	83	0.31	0.032
	Feb, 1985	6.8	2995	257	1145	74	0.25	0.040
	Mar, 1985	6.8	2857	288	1210	76	0.21	0.043
M-43	Jan, 1985	6.9	3421	278	1136	104	0.20	0.377
	Feb, 1985	6.8	3132	282	1223	104	0.35	0.366
	Mar, 1985	7.0	3061	319	1304	102	0.48	0.391
I-46	Jan, 1985	6.2	2092	90	818	55	0.61	< 0.001
	Feb, 1985	6.5	1923	87	692	57	0.48	0.003
	Mar, 1985	6.7	2755	107	816	56	0.60	0.008

TABLE 2
NINE MILE LAKE
PATTERN 3 QUARTERLY WELL DATA
FIRST QUARTER, 1985

	PATTERN BASELINE RANGE	M-40	M-41	M-42	M-43	I-46	P-50	P-53
pH	6.4-7.6	7.2	6.6	6.8	6.9	6.2	6.4	5.4
Conductivity	1200-3500	1703	2242	2995	3132	1923	1676	1868
MAJOR CONSTITUENTS								
Bicarbonate	176-507	181	165	255	278	90	111	44
Carbonate	0-0	0	0	0	0	0	0	0
Alkalinity as CaCO ₃ eq.	144-416	148	135	209	228	74	91	36
Calcium	41-135	43	52	83	104	55	52	34
Chloride	20-25	23	27	34	37	25	25	18
Magnesium	13-71	23	26	42	47	24	22	17
Potassium	5.9-16.0	4.2	5.1	7.3	8.1	8.4	5.5	8.1
Sodium	310-863	295	352	508	528	328	286	310
Sulfate	628-2826	641	808	1235	1136	818	716	736
TDS	880-3320	1160	1380	2080	2109	1260	1220	1180
Anion/Cation Balance		100	100	98	105	100	99	98
MINOR CONSTITUENTS								
Arsenic	0.01-4.10	0.005	0.004	0.003	0.005	0.027	0.056	0.008
Iron		0.61	0.26	0.31	0.20	0.61	0.54	2.5
Selenium	0.01-0.45	0.013	<0.001	0.007	0.001	0.003	<0.001	0.001
Vanadium		0.200	0.307	0.104	0.125	0.303	0.303	0.452
RADIOCHEMISTRY								
Uranium (U ₃ O ₈)	0.001-0.200	0.012	<0.001	0.032	0.377	<0.001	0.029	0.046
Radium-226	1.5-274	52	29	142	13	252	590	331

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

TABLE 3
NINE MILE LAKE
PATTERN 4 MONTHLY WELL DATA
FIRST QUARTER, 1985

		pH	CONDUCTIVITY <u>µmhos/cm</u>	CHLORIDE <u>mg/l</u>	BICARBONATE <u>mg/l</u>	URANIUM (U ₃ O ₈) <u>mg/l</u>	CALCIUM <u>mg/l</u>	VANADIUM <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	Jan, 1985	6.9	7895	83	323	0.729	240	0.977
	Feb, 1985	7.0	7000	81	316	0.602	210	0.744
	Mar, 1985	7.0	7142	75	368	0.804	231	0.526
M-54	UCL	7.5	8413	130	322	1.040	329	0.16
	Jan, 1985	6.5	10000	144	328	1.02	396	0.114
	Feb, 1985	6.5	11648	138	329	0.911	390	0.074
	Mar, 1985	6.5	11224	122	323	1.03	424	0.069
		7.8						
M-55	UCL	6.8	3285	59	280	0.464	133	0.08
	Jan, 1985	6.8	3289	35	239	0.247	80	0.021
	Feb, 1985	7.0	2967	40	238	0.289	97	0.007
	Mar, 1985		2959	30	267	0.311	84	0.004
		7.6						
M-56	UCL	7.1	3080	57	373	0.183	107	0.37
	Jan, 1985	7.0	1842	25	180	0.069	38	0.448
	Feb, 1985	7.0	1703	31	181	0.097	47	0.389
	Mar, 1985		1633	26	203	0.122	38	0.348
		7.8						
M-57	UCL	6.9	3218	61	373	0.150	112	0.34
	Jan, 1985	6.8	3553	40	242	0.084	81	0.246
	Feb, 1985	6.9	3242	46	252	0.100	95	0.210
	Mar, 1985		3163	35	281	0.131	79	0.182
I-60	UCL							
	Jan, 1985	7.0	9868	106	380	1.24	306	0.989
	Feb, 1985	7.0	8956	106	385	1.08	299	0.632
	Mar, 1985	7.0	8878	95	392	1.22	289	0.489

TABLE 4
NINE MILE LAKE
PATTERN 4 QUARTERLY WELL DATA
FIRST QUARTER, 1985

	PATTERN BASELINE RANGE	M-54	M-55	M-56	M-57	I-60	P-62
pH	6.4-6.8	6.5	6.8	7.1	6.9	7.0	6.89
Conductivity	5500-7500	10000	3289	1842	3553	9868	7895
<u>MAJOR CONSTITUENTS</u>							
Bicarbonate	254-291	328	239	180	242	380	323
Carbonate	0	0	0	0	0	0	0
Alkalinity as CaCO ₃ eq	208-239	269	196	148	198	311	265
Calcium	190-282	396	80	38	81	306	240
Chloride	60-118	144	35	25	40	106	83
Magnesium	100-144	158	41	21	43	114	95
Potassium	10-14	15.8	7.3	5.5	7.7	14.3	11.7
Sodium	1107-1709	2397	495	271	570	1707	1397
Sulfate	3133-4601	6202	1095	636	1219	4046	3648
TDS	5260-6520	10300	1975	1180	2240	7280	5740
Anion/Cation Balance		100	102	96	103	103	98
<u>MINOR CONSTITUENTS</u>							
Arsenic	0.024	0.004	0.005	0.016	0.005	0.029	0.019
Iron	0.4-2.7	0.78	0.32	0.26	0.09	3.9	0.10
Selenium	0.002-0.-01	< 0.001	< 0.001	0.152	0.007	0.166	0.175
Vanadium	0.02-0.15	0.114	0.021	0.448	0.246	0.989	0.977
<u>RADIOCHEMISTRY</u>							
Uranium (U ₃ O ₈)	0.063-0.165	1.02	0.247	0.069	0.084	1.24	0.729
Radium-226	270-520	761	311	31	19	133	109

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

TABLE 5
RADIOMETRIC AIR PARTICULATE
NINE MILE LAKE
FOURTH 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)*		-0.5 \pm 2.3	0.8 \pm 1.4	3.0
Downwind Boundary (#3)*		12 \pm 6	18 \pm 4	35
Downwind Boundary (#3B)*		14 \pm 6	38 \pm 6	66
Inside Process Building (#4)**		4.8 \pm 4.2	3.4 \pm 3.6	6.7
* 10 CFR 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
FIRST QUARTER, 1985

<u>Site</u>		<u>Rn-222 ($\mu\text{Ci/ml} \times 10^{-9}$)</u>
Upwind Control (#5)*	Jan, 1985	-0.08 \pm 0.40
	Feb, 1985	0.72 \pm 0.74
	Mar, 1985	0.48 \pm 0.82
Downwind Boundary (#3)*	Jan, 1985	-0.07 \pm 0.52
	Feb, 1985	0.49 \pm 0.39
	Mar, 1985	0.77 \pm 0.72
Downwind Boundary (#3B)*	Jan, 1985	0.14 \pm 0.06
	Feb, 1985	0.24 \pm 0.46
	Mar, 1985	1.78 \pm 0.65
Process Building** Upper Deck	Jan, 1985	0.55 \pm 0.53
	Feb, 1985	-0.48 \pm 0.39
	Mar, 1985	0.60 \pm 0.58
Process Building** Lower Deck	Jan, 1985	0.78 \pm 0.40
	Feb, 1985	0.41 \pm 0.36
	Mar, 1985	0.75 \pm 0.78
* 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
FIRST QUARTER, 1985

<u>SITE</u>	<u>WORKING LEVEL</u>		
	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>
Surface Discharge Surge Tank	0.002	< 0.001	0.007
Upper Deck	0.007	< 0.001	0.006
Lower Deck	0.002	0.002	0.001
Sump Pump	< 0.001	0.002	0.007
R/O unit	0.005	0.001	0.011
Assay Station	0.003	0.001	0.013
Lunch Room	< 0.001	< 0.001	0.001
Water Lab	< 0.001	0.001	0.004
Radiation Lab	0.003	< 0.001	0.001
Security Office	< 0.001	< 0.001	0.002
Superintendent's Office	< 0.001	< 0.001	0.010
Storage Loft	0.004	< 0.001	0.007

Detection Limit 0.001 WL

10 CFR 20 Limit 0.3 WL

TABLE 8
AREA DOSIMETRY*
NINE MILE LAKE
FIRST QUARTER, 1985

<u>SITE</u>	<u>MREM/QUARTER</u>
Upwind Control	32.53
Pattern 1	27.51
Pattern 2	36.13
Pattern 3	30.34
Pattern 4	lost badge
Downwind Boundary-Site 3	29.70
Downwind Boundary-Site 3B	30.47
Lower Deck	39.73
Upper Deck	44.49
Water Lab	24.17
Superintendent's Office	24.81
Radiation Lab	21.73
Security Office	25.84
Lunchroom	24.30
Assay Station	32.14

*Dosimetry service performed by Eberline.

Badges are exchanged quarterly.

TABLE 9
 QUARTERLY ALPHA SURVEY
 NINE MILE LAKE
 FIRST QUARTER, 1985

<u>SITE</u>	<u>TOTAL REMOVABLE ALPHA dpm/100cm²</u>
Water Lab	4.0
Radiation Lab	6.0
Assay Station	<1.0
Lunch Room	6.0
Security Office	<1.0
Superintendent's Office	2.0
Limit for removable alpha	1000