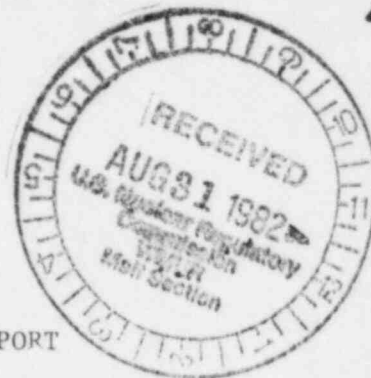


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QUARTERLY ENVIRONMENTAL MONITORING REPORT

for

4/1/82 - 6/30/82



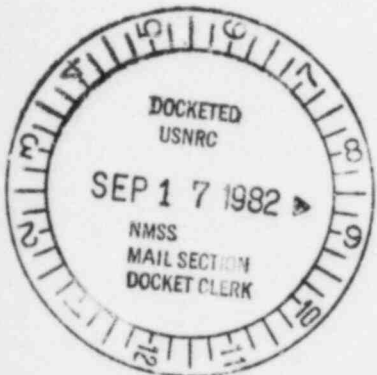
Prepared

By

RIO ALGOM CORPORATION

Source Materials License Number - SUA-1119

Docket Number - 40-8084



M. D. Lawton

M. D. Lawton
Manager

8-27-82

Date

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In compliance with our Source Materials License Condition Numbers 36 and 37, I submit our 2nd Quarterly Environmental Monitoring Report for 1982. These data were collected in compliance with the schedule required by our Operational Environmental Monitoring Program.

Dose evaluations based upon our currently available data have been included in this report as required by License Condition Number 37.

Unless otherwise indicated, the present MPC's have been based upon the calculation provided on Page 14.

NOTE

A delay in sample preparation by a commercial laboratory has made it necessary to submit this report with several data omissions. These data will be forwarded in an addendum to this quarterly report upon their completion.

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1) STACK - YELLOWCAKE AND ORE

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DATE COLLECTED	LOCATION OPERATING HRS./QTR. x	FLOW RATE (M ³ /Sec.) y	RADIONUCLIDE	AVERAGE IN-STACK CONCENTRATION (uCi/ml) z	ERROR ESTIMATE (uCi/ml)	(a) RELEASE RATE (Ci/qtr.)	ERROR ESTIMATE (Ci/qtr.)	LLD (uCi/ml)	(b) % MPC
4/82	Yellowcake (c) Dust Filter	.174	U-Nat	.032E-10	---	1.26E-6	---	1.E-12	3.2
			Th-230	66.7E-12	41.3E-12	2.62E-5	1.63E-5	1.6E-14	3335.
			Ra-226	1.08E-11	.62E-11	4.25E-6	2.44E-6	4.E-13	36.
			Pb-210	0.00E-10	.27E-10	0	1.06E-5	8.E-13	0
4/82	Yellowcake (c) Scrubber	.391	U-Nat	16.94E-10	---	1.53E-3	---	1.E-12	1694.
			Th-230	69.9E-12	128.9E-12	6.33E-5	1.16E-4	1.6E-14	3495.
			Ra-226	1.87E-11	.96E-11	1.69E-5	8.69E-6	4.E-13	62.
			Pb-210	.99E-10	.81E-10	8.96E-5	7.33E-5	8.E-13	99.
4/82	Dryer (c) Center Column	.179	U-Nat	.65E-10	---	2.69E-5	---	1.E-12	65.
			Th-230	62.9E-12	36.1E-12	2.61E-5	1.50E-5	1.6E-14	3145.
			Ra-226	1.12E-11	.60E-11	4.64E-6	2.49E-6	4.E-13	37.
			Pb-210	.17E-10	.22E-10	7.04E-6	9.12E-6	8.E-13	17.
	Crusher (d) House		U-Nat					1.E-12	
			Th-230					1.6E-14	
			Ra-226			REQUIRED SEMIANNUALLY		4.E-13	
			Pb-210					8.E-13	
	Transfer (d) House		U-Nat					1.E-12	
			Th-230					1.6E-14	
			Ra-226					4.E-13	
			Pb-210					8.E-13	
	Headframe (d) House		U-Nat					1.E-12	
			Th-230					1.6E-14	
			Ra-226					4.E-13	
			Pb-210					8.E-13	

- a) Release rate calculation = $x(\text{hrs./qtr.}) \cdot 3600 \text{ sec./hr.} \cdot y(\text{M}^3/\text{sec.}) \cdot z(\text{uCi/ml}) \cdot 10^6 \text{ ml/M}^3 = 3,600 \cdot xyz \text{ (Ci/qtr.)}$
- b) No atmospheric dispersion considerations or background adjustments were used in stack % MPCa calculations.
- c) Yellowcake MPCa = 1×10^{-10} uCi/ml (Restricted Areas).
- d) Ore Dust MPCa = 0.5×10^{-10} uCi/ml (Restricted Areas).

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2) AIR SAMPLES - Air Particulates and Radon Gas

DATE COLLECTED	LOCATION	RADIONUCLIDE	GROSS CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	(e) % MPCa
4/1 to 6/30/82	EM-1 (S-1)	U-Nat	.049E-15	---	5.E-16	.001
		Th-230	*	*	5.E-16	*
		Ra-226	.30E-15	.14E-15	5.E-16	.02
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.16E-9	.14E-9	2.E-10	5.3
4/1 to 6/30/82	EM-2 (S-2)	U-Nat	1.08E-15	---	5.E-16	.02
		Th-230	*	*	5.E-16	*
		Ra-226	.53E-15	.19E-15	5.E-16	.03
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.53E-9	.43E-9	2.E-10	17.7
4/1 to 6/30/82	EM-3 (S-3)	U-Nat	2.0E-15	---	5.E-16	.04
		Th-230	*	*	5.E-16	*
		Ra-226	.32E-15	.14E-15	5.E-16	.02
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.21E-9	.19E-9	2.E-10	7.0
4/1 to 6/30/82	EM-4 (S-4)	U-Nat	.45E-15	---	5.E-16	.009
		Th-230	*	*	5.E-16	*
		Ra-226	.32E-15	.14E-15	5.E-16	.02
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.2E-9	.17E-9	2.E-10	6.7
4/1 to 6/30/82	EM-5 (S-5)	U-Nat	1.04E-15	---	5.E-16	.02
		Th-230	*	*	5.E-16	*
		Ra-226	.95E-15	.35E-15	5.E-16	.05
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.33E-9	.27E-9	2.E-10	11.0
4/1 to 6/30/82	EM-6 (S-6) Bckgrd.	U-Nat	.38E-15	---	5.E-16	.008
		Th-230	*	*	5.E-16	*
		Ra-226	.14E-15	.07E-15	5.E-16	.007
		Pb-210	*	*	2.E-14	*
		Rn-222 (gas)	.17E-9	.14E-9	2.E-10	5.7

* Data to follow

- e) % MPCa is based upon gross nuclide concentrations divided by the appropriate unrestricted area MPCa from Table 1 on Page 14. No subtraction of EM-6 concentrations (area background) have been performed.

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3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
4/1 to 6/30/82	MW-1	Groundwater	U-Nat	4.85E-7	---	9.E-9	4.57E-7	.05
			Th-230	11.2E-9	11.2E-9	1.E-9	2.4E-9	.005
		Restricted	Ra-226	.35E-9	.20E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	2.3E-9	.90E-9	2.E-9	0	0
4/1 to 6/30/82	MW-2	Groundwater	U-Nat	.92E-7	---	9.E-9	6.4E-8	.006
			Th-230	27.6E-9	17.5E-9	1.E-9	1.8E-8	.038
		Restricted	Ra-226	.50E-9	.24E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	1.6E-9	1.4E-9	2.E-9	0	0
4/1 to 6/30/82	MW-3	Groundwater	U-Nat	650.66E-7	---	9.E-9	6.5E-5	6.5
			Th-230	41.3E-9	16.2E-9	1.E-9	3.3E-8	.065
		Restricted	Ra-226	2.1E-9	.73E-9	1.E-9	1.3E-9	.31
			Pb-210	*	*	1.E-8	*	*
			Po-210	3.4E-9	1.5E-9	2.E-9	0	0
4/1 to 6/30/82	MW-4	Groundwater	U-Nat	44.55E-7	---	9.E-9	4.4E-6	14.8
			Th-230	21.2E-9	11.0E-9	1.E-9	1.2E-8	.62
		Unrestricted	Ra-226	.91E-9	.37E-9	1.E-9	6.E-11	.2
			Pb-210	*	*	1.E-8	*	*
			Po-210	31.8E-9	3.3E-9	2.E-9	2.7E-8	3.8
4/1 to 6/30/82	H-48	Groundwater	U-Nat	234.18E-7	---	9.E-9	2.3E-5	2.3
			Th-230	35.5E-9	13.9E-9	1.E-9	2.7E-8	.05
		Restricted	Ra-226	1.08E-9	.47E-9	1.E-9	2.3E-10	.06
			Pb-210	*	*	1.E-8	*	*
			Po-210	61.0E-9	5.1E-9	2.E-9	5.6E-8	.28
4/1 to 6/30/82	H-54	Groundwater	U-Nat	709.62E-7	---	9.E-9	7.1E-5	7.1
			Th-230	115.E-9	23.E-9	1.E-9	1.06E-7	.21
		Restricted	Ra-226	1.38E-9	.56E-9	1.E-9	5.3E-10	.13
			Pb-210	*	*	1.E-8	*	*
			Po-210	2.1E-9	1.38E-9	2.E-9	0	0
4/1 to 6/30/82	H-56	Groundwater	U-Nat	675.19E-7	---	9.E-9	6.7E-5	6.7
			Th-230	91.9E-9	19.2E-9	1.E-9	8.3E-8	.17
		Restricted	Ra-226	.82E-9	.36E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	3.9E-9	1.6E-9	2.E-9	0	0

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* Data to follow

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3a) LIQUID SAMPLES - Dissolved Radionuclides in Groundwaters (Cont'd.)

04080841811

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDES	GROSS AVERAGE CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	NET AVERAGE CONCENTRATION (uCi/ml)	% MPCw
4/1 to 6/30/82	H-71	Groundwater	U-Nat	1.23E-7	---	9.E-9	9.5E-8	.01
			Th-230	23.9E-9	12.1E-9	1.E-9	1.5E-8	.03
		Restricted	Ra-226	.59E-9	.25E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	2.1E-9	1.1E-9	2.E-9	0	0
4/1 to 6/30/82	DM80-1	Groundwater	U-Nat	10.9E-7	---	9.E-9	1.1E-6	.1
			Th-230	6.2E-9	8.7E-9	1.E-9	0	0
		Restricted	Ra-226	.84E-9	.32E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	4.4E-9	1.3E-9	2.E-9	0	0
4/1 to 6/30/82	MW-5 Background	Groundwater	U-Nat	.28E-7	---	9.E-9	0	0
			Th-230	8.8E-9	11.4E-9	1.E-9	0	0
		Unrestricted	Ra-226	.85E-9	.36E-9	1.E-9	0	0
			Pb-210	*	*	1.E-8	*	*
			Po-210	5.3E-9	1.5E-9	2.E-9	0	0

* Data To Follow

$$\% \text{ MPCw} = \frac{\text{Average Gross Concentration} - \text{Background (MW-5) Concentration}}{\text{MPCw from Table I}} \times 100$$

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a) GROUNDWATER - Dissolved Chemistries

040080841813

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE OF MONTHLY CONCENTRATIONS (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
4/1 to 6/30/82	MW-1 Restricted Area	Ground Water	Calcium Carbonate	513.	33.	NA	---
			Boron	*	*	NA	---
			Calcium	137.	45.	200 ¹	23.
			Chloride	460.	401.	250 ¹	160.
			Magnesium	37.	0.	NA	---
			Manganese	*	*	NA	*
			Nitrate (NO ₃ -N)	7.66	7.52	10 ^{2,3}	75.
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	216.	197.	200 ¹	99.
			Sulfate	292.	127.	250 ¹	51.
		Total Dissolved Solids	1574.	275.	500 ¹	175.	
4/1 to 6/30/82	MW-2 Restricted Area	Ground Water	Calcium Carbonate	427.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	114.	22.	200 ¹	11.
			Chloride	514.	455.	250 ¹	182.
			Magnesium	28.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	4.66	4.52	10 ^{2,3}	45.
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	216.	197.	200 ¹	99.
			Sulfate	160.	0.	250 ¹	0.
		Total Dissolved Solids	1427.	728.	500 ¹	146.	

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- NRC G.E.I.S. '79

3 - Utah State Drinking Water Standards

- EPA Drinking Water Standard

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

* Data To Follow

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Groundwater Dissolved Chemistries (Cont'd.)

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE OF MONTHLY CONCENTRATIONS (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
4/1 to 6/30/82	MW-3 Restricted Area	Ground Water	Calcium Carbonate	227.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	60.	0.	200 ¹	0.
			Chloride	1115.	1056.	250 ¹	422.
			Magnesium	34.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	0.38	.24	10 ^{2,3}	2.4
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	7524.	7505.	200 ¹	3753.
			Sulfate	4803.	4638.	250 ¹	1855.
			Total Dissolved Solids	23,087.	22,388.	500 ¹	4478.
4/1 to 6/30/82	MW-4 Unrestricted Area	Ground Water	Calcium Carbonate	863.	383.	NA	---
			Boron	*	*	NA	*
			Calcium	335.	243.	200 ¹	122.
			Chloride	300.	241.	250 ¹	96.
			Magnesium	86.	36.	NA	---
			Manganese	*	*	NA	*
			Nitrate (NO ₃ -N)	4.66	4.52	10 ^{2,3}	45.
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	499.	480.	200 ¹	240.
			Sulfate	1474.	1309.	250 ¹	524.
			Total Dissolved Solids	3393.	2694.	500 ¹	539.

- NRC G.E.I.S. '79

- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

* Data To Follow

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groundwater Dissolved Chemistries (Cont'd.)

04008084181

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE OF MONTHLY CONCENTRATIONS (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
4/1 to 6/30/82	MW-5 Background Well Unrestricted Area	Ground Water	Calcium Carbonate	480.	---	NA	---
			Boron	*	---	NA	---
			Calcium	92.	---	200 ¹	0.
			Chloride	59.	---	250 ¹	0.
			Magnesium	50.	---	NA	---
			Manganese	*	---	NA	---
			Nitrate (NO ₃ -N)	0.14	---	10 ^{2,3}	0.
			Selenium	*	---	.01 ^{1,2,3}	---
			Sodium	19.	---	200 ¹	0.
			Sulfate	165.	---	250 ¹	0.
			Total Dissolved Solids	699.	---	500 ¹	0.
4/1 to 6/30/82	H-48 Restricted Area	Ground Water	Calcium Carbonate	313.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	80.	0.	200 ¹	0.
			Chloride	862.	803.	250 ¹	321.
			Magnesium	16.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	9.00	8.86	10 ^{2,3}	89.
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	2866.	2847.	200 ¹	1424.
			Sulfate	3552.	3387.	250 ¹	1355.
			Total Dissolved Solids	8550.	7851.	500 ¹	1570.

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- NRC G.E.I.S. '79 3 - Utah State Drinking Water Standards
 - EPA Drinking Water Standard 4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations
 * Data To Follow

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Groundwater Dissolved Chemistries (Cont'd.)

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE OF MONTHLY CONCENTRATIONS (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
4/1 to 6/30/82	H-54 Restricted Area	Ground Water	Calcium Carbonate	173.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	43.	0.	200 ¹	0.
			Chloride	1112.	1053.	250 ¹	421.
			Magnesium	31.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	0.39	.25	10 ^{2,3}	2.5
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	8466.	8447.	200 ¹	4224.
			Sulfate	6301.	6136.	250 ¹	2454.
			Total Dissolved Solids	23,125.	22,426.	500 ¹	4485.
4/1 to 6/30/82	H-56 Restricted Area	Ground Water	Calcium Carbonate	443.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	146.	54.	200 ¹	27.
			Chloride	1010.	951.	250 ¹	380.
			Magnesium	58.	8.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	0.31	.17	10 ^{2,3}	1.7
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	6141.	6122.	200 ¹	3061.
			Sulfate	4852.	4687	250 ¹	1875.
Total Dissolved Solids	20,807.	20,108.	500 ¹	4022.			

1 - NRC G.E.I.S. '79

2 - EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

* Data To Follow

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groundwater Dissolved Chemistries (Cont'd.)

04008084181E

DATE COLLECTED	LOCATION	TYPE	CHEMISTRY TYPE	GROSS AVERAGE OF MONTHLY CONCENTRATIONS (mg/L)	(4) NET CONCENTRATION	STANDARD (mg/L)	% STANDARD
4/1 to 6/30/82	H-71 Restricted Area	Ground Water	Calcium Carbonate	233.	0.	NA	---
			Boron	*	*	NA	---
			Calcium	45.	0.	200 ¹	0
			Chloride	63.	4.	250 ¹	1.6
			Magnesium	19.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	2.39	2.25	10 ^{2,3}	23.
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	382.	363.	200 ¹	182.
			Sulfate	673.	508.	250 ¹	203.
			Total Dissolved Solids	1689.	990.	500 ¹	198.
4/1 to 6/30/82	DM80-1 Restricted Area	Ground Water	Calcium Carbonate	640.	160.	NA	---
			Boron	*	*	NA	---
			Calcium	280.	188.	200 ¹	94.
			Chloride	225.	166.	250 ¹	66.
			Magnesium	48.	0.	NA	---
			Manganese	*	*	NA	---
			Nitrate (NO ₃ -N)	3.66	3.52	10 ^{2,3}	35
			Selenium	*	*	.01 ^{1,2,3}	*
			Sodium	132.	113.	200 ¹	57.
			Sulfate	667.	502.	250 ¹	201.
			Total Dissolved Solids	1866.	1167.	500 ¹	233.

- NRC G.E.I.S. '79

- EPA Drinking Water Standard

3 - Utah State Drinking Water Standards

4 - Net Concentrations = Gross Concentrations minus Background Well #5 Concentrations

* Data To Follow

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3b) LIQUID SAMPLES - Surface Waters

04008084181E

DATE COLLECTED	LOCATION	TYPE AREA	RADIONUCLIDE	CONCENTRATION (uCi/ml)	ERROR ESTIMATE (uCi/ml)	LLD (uCi/ml)	% MPCw
4/82	SS-1	Surface Water	U-Nat d	0.053E-7	---	9.0E-9	.018
			s	0.054E-7	---	9.0E-9	.018
			Th-230 d	19.86E-9	8.9E-9	1.0E-9	.99
		Unrestricted	s	0.0E-9	8.9E-9	1.0E-9	0
			Ra-226 d	0.44E-9	0.20E-9	1.0E-9	1.47
			s	0.0E-9	0.20E-9	1.0E-9	0
			Pb-210 d	*	*	1.0E-8	*
			s	*	*	1.0E-8	*
			Po-210 d	0.0E-9	0.65E-9	2.0E-9	0
s	1.84E-9	0.68E-9	2.0E-9	.006			
4/82	SS-2	Surface Water	U-Nat d	0.089E-7	---	9.0E-9	.03
			s	0.0E-7	---	9.0E-9	0
			Th-230 d	14.72E-9	8.2E-9	1.0E-9	.74
		Unrestricted	s	2.42E-9	9.1E-9	1.0E-9	.007
			Ra-226 d	0.13E-9	0.10E-9	1.0E-9	.43
			s	0.0E-9	0.10E-9	1.0E-9	0
			Pb-210 d	*	*	1.0E-8	*
			s	*	*	1.0E-8	*
			Po-210 d	1.01E-9	0.54E-9	2.0E-9	.14
s	0.0E-9	0.80E-9	2.0E-9	0			
4/82	SS-3	Surface Water	U-Nat d	7.68E-7	---	9.0E-9	2.6
			s	0.0E-7	---	9.0E-9	0
			Th-230 d	25.0E-9	8.62E-9	1.0E-9	.01
		Unrestricted	s	0.0E-9	8.89E-9	1.0E-9	0
			Ra-226 d	1.02E-9	0.30E-9	1.0E-9	3.4
			s	0.02E-9	0.30E-9	1.0E-9	0
			Pb-210 d	*	*	1.0E-8	*
			s	*	*	1.0E-8	*
			Po-210 d	0.50E-9	0.73E-9	2.0E-9	.07
s	1.34E-9	1.04E-9	2.0E-9	.004			
4/82	SS-4 1000 ft. South of lower tailings pond.	Surface Water	U-Nat d	2.95E-7	---	9.0E-9	.98
			s	0.01E-7	---	9.0E-9	.003
			Th-230 d	10.70E-9	7.71E-9	1.0E-9	.54
		Unrestricted	s	0.0E-9	7.71E-9	1.0E-9	0
			Ra-226 d	3.53E-9	0.55E-9	1.0E-9	11.8
			s	0.48E-9	0.62E-9	1.0E-9	.002
			Pb-210 d	*	*	1.0E-8	*
			s	*	*	1.0E-8	*
			Po-210 d	0.97E-9	0.58E-9	2.0E-9	.14
s	0.87E-9	0.86E-9	2.0E-9	.003			
4/82	SS-7	Surface Water	U-Nat d	0.161E-7	---	9.0E-9	.054
			s	0.035E-7	---	9.0E-9	.012
			Th-230 d	11.04E-9	8.16E-9	1.0E-9	.55
		Unrestricted	s	0.0E-9	8.16E-9	1.0E-9	0
			Ra-226 d	0.24E-9	0.14E-9	1.0E-9	.8
			s	0.45E-9	0.26E-9	1.0E-9	.002
			Pb-210 d	*	*	1.0E-8	*
			s	*	*	1.0E-8	*
			Po-210 d	1.47E-9	0.82E-9	2.0E-9	.21
s	0.0E-9	0.82E-9	2.0E-9	0			

d = dissolved % MPCw's are based upon the limits set in 10 CFR 20, Appendix B.
s = suspended

Dissolved MPC's are based upon soluble limits.

Suspended MPC's are based upon insoluble limits.

*Data to Follow

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4a) VEGETATION

DATE COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIONUCLIDE	CONCENTRATION (uCi/Kg)	ERROR ESTIMATE (uCi/Kg)	LLD (uCi/Kg)
	EM-1 (S-1)	Grab	Ra-226			2.E-7
			Pb-210			5.E-7
	EM-3 (S-3)	Grab	Ra-226			2.E-7
			Pb-210	Required Annually		5.E-7
	EM-4 (S-4)	Grab	Ra-226			2.E-7
			Pb-210			5.E-7
	EM-6 (S-6)	Grab	Ra-226			2.E-7
			Pb-210			5.E-7

4b) FOOD - Livestock

DATE COLLECTED	LOCATION (Nearest Residents)	TYPE/PORTION ANALYZED	RADIONUCLIDE	GROSS CONCENTRATION (uCi/Kg)	ERROR ESTIMATE (uCi/Kg)	LLD (uCi/Kg)
2/11/82 Sample #1	Resided within 3 km of the mill.	Grab/Ground Beef	U-Nat	3.5E-5	---	2.E-7
			Th-230	2.0E-6	7.0E-6	2.E-7
			Ra-226	1.0E-6	2.0E-6	2.E-7
			Pb-210	5.0E-6	10.0E-6	5.E-7
			Po-210	2.0E-6	1.0E-6	5.E-7
2/11/82 Sample #2	Resided within 3 km of the mill	Grab/Ground Beef	U-Nat	2.3E-5	---	2.E-7
			Th-230	4.E-6	4.E-6	2.E-7
			Ra-226	0.E-6	1.E-6	2.E-7
			Pb-210	4.E-6	9.E-6	5.E-7
			Po-210	1.E-6	1.E-6	5.E-7

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5a) SOIL

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DATE COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIONUCLIDE	(a) GROSS CONCENTRATION (uCi/g)	ERROR ESTIMATE (uCi/g)	LLD (uCi/g)
	EM-1 (S-1)	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	EM-2 (S-2)	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	EM-3 (S-3)	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210	REQUIRED ANNUALLY		1.00E-6
	EM-4 (S-4)	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	EM-5 (S-5)	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	EM-6 (S-6) Bckgrd.	Grab/Surface	U-Nat			1.00E-6
			Ra-226			2.00E-7
			Pb-210			1.00E-6

5b) SEDIMENT

DATE COLLECTED	LOCATION	TYPE/PORTION ANALYZED	RADIONUCLIDE	GROSS CONCENTRATION (uCi/g)	ERROR ESTIMATE (uCi/g)	LLD (uCi/g)
	SS-1		U-Nat			1.00E-6
			Th-230			2.00E-7
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	SS-2		U-Nat			1.00E-6
			Th-230			2.00E-7
			Ra-226			2.00E-7
			Pb-210	REQUIRED ANNUALLY		1.00E-6
	SS-3		U-Nat			1.00E-6
			Th-230			2.00E-7
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	SS-7		U-Nat			1.00E-6
			Th-230			2.00E-7
			Ra-226			2.00E-7
			Pb-210			1.00E-6
	1000 ft. south of lower tls. pond.		U-Nat			1.00E-6
			Th-230			2.00E-7
			Ra-226			2.00E-7
			Pb-210			1.00E-6

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6) DIRECT RADIATION

DATES MONITORED	LOCATION	NET EXPOSURE RATE (mr/qtr.)	NET ERROR ESTIMATE (mr/qtr.)
4/1 to 6/30/82	EM-1 (S-1)	14.0	4.9
4/1 to 6/30/82	EM-2 (S-2)	20.	5.4
4/1 to 6/30/82	EM-3 (S-3)	22.	5.6
4/1 to 6/30/82	EM-4 (S-4)	15.	5.0
4/1 to 6/30/82	EM-5 (S-5)	19.	5.3
4/1 to 6/30/82	EM-6 (S-6)	12.	4.7

Badge supplier's background = 27 mr/qtr. subtracted.

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SUPPLEMENTARY INFORMATION

Surface Water and Sediment Sampling Sites (See Attachment)

<u>SITE</u>	<u>DIRECTION FROM MILL</u>	<u>LOCATION</u>
SS-1	NW	West Coyote Wash
SS-2	NW	West Coyote Creek - Sunnyside Incline
SS-3	E	Ditch to Redd Reservoir
SS-7	E	Redd Reservoir
SS-4 (1000 ft. south of lower tailings pond)	SW	1000 feet south of the lower tailings pond

Environmental Monitoring Sites (See Attached Map)

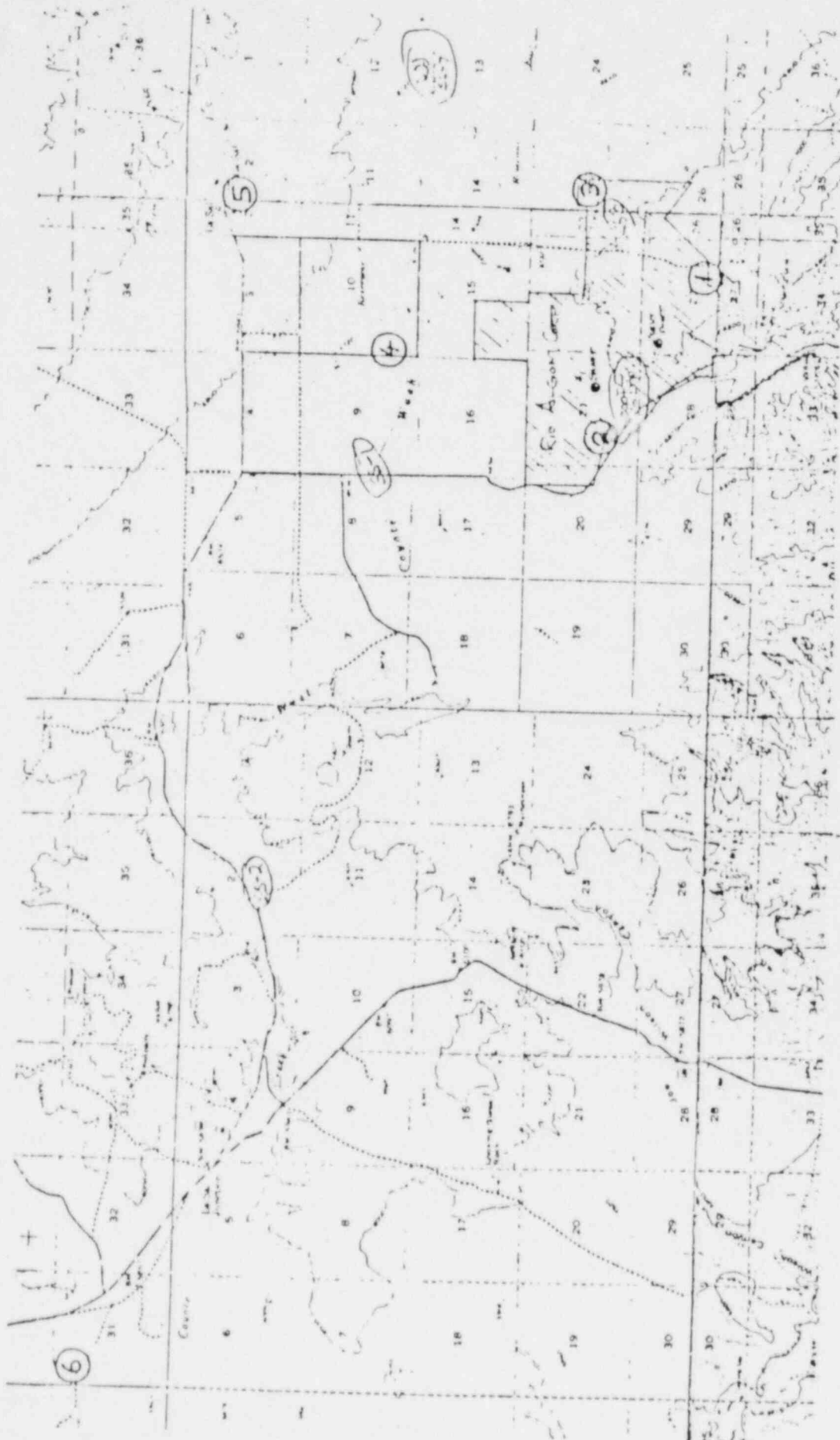
<u>SITE</u>	<u>DIRECTION FROM MILL</u>	<u>LOCATION</u>
S1 (EM-1)	SE	South property boundary
S2 (EM-2)	SW	West property boundary
S3 (EM-3)	E	East property boundary
S4 (EM-4)	N	Nearest residence, approximately 1 mile north of property boundary
S5 (EM-5)	NE	La Sal School (occupiable structure)
S6 (EM-6)	NW	10.5 miles northwest of the mill

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EMV sections = O



Sampling locations for air particulates, radon, soils, and direct radiation. Vegetation sampling near sites 1, 3, and 6.

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DOSE ASSESSMENT BASED UPON ACTUAL ENVIRONMENTAL
MONITORING DATA AT THE NEAREST RESIDENCE - SITE NO. 4

Reporting Period: 4/1/82 - 6/30/82

Internal Radiation Exposure

The most probable pathway is inhalation of airborne particulates.

50 year dose commitment (mrem)

RADIONUCLIDE	WHOLE BODY (f)	BONE (f)	LUNG (f)
U-Nat	3.2E-4	4.6E-3	.012
Th-230	*	*	*
Ra-226	5.6E-3	.056	1.19

For Dose Calculations, see Page 13.

External Radiation Exposure

Exposure for the period of 4/1 - 6/30/82 from page 11 equals 15. - 12. = 3. mrem.

Nearest residence (EM-4) - Background (EM-6) = 3 mrem/qtr.

(f) Based upon net nuclide concentrations.

* Data To Follow

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DOSE CONVERSION CALCULATION FOR INHALATION OF AIRBORNE PARTICULATES
AT ENVIRONMENTAL MONITORING SITE NO. 4 (NEAREST RESIDENCE MONITOR)

(Gross Concentration) - (Background Concentration) = (Net Concentration) in uCi/ml

since: $1 \times 10^{+12}$ uCi/ml = pCi/M³

Net Concentration (uCi/ml) $\times 10^{+12}$ = Net Concentration (pCi/M³)

and then:

Net Concentration (pCi/M³) \times Dose Conversion Factor (rrem/pCi/M³) = Dose (mrem)

NUCLIDE	EM-4 GROSS	-	EM-6 BACKGROUND	=	EM-4 NET	$\times 10^{+12}$	\times	ORGAN DOSE CONVERSION FACTOR
U-Nat	4.5E-15	-	.38E-15	=	7.E-17	7.E-5		(pCi/M ³) \times fi ₁
Th-230	*	-		=	*	*		(pCi/M ³) \times fi ₂
Ra-226	.32E-15	-	.14E-15	=	.18E-15	.18E-3		(pCi/M ³) \times fi ₃

Organ Dose Conversion Factors (Fi)

From Table A-1 of "Compliance Determination Procedures for Environmental Radiation Protection Standards for Uranium Recovery Facilities, 40 CFR 190, November 1980".

	Whole Body	Bone	Lung
U-Nat	4.62	79.4	169.
Th-230	166.	5950.	3220.
Ra-226	30.9	309.	6610.

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* Data To Follow

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TABLE I

MPC's Used in Calculation of % MPC

Reference 10 CFR 20, Appendix B

	Restricted Area (uCi/ml)			Unrestricted Area (uCi/ml)	
	Air		Water	Air	Water
	Ore	Yellowcake			
U-Natural	$.5 \times 10^{-10}$ uCi/ml	1.0×10^{-10} uCi/ml	1×10^{-3} S,I	5×10^{-12}	3×10^{-5} S,I
Th-230		2×10^{-12} S	5×10^{-5} S	8×10^{-14} S	2×10^{-6} S, 3×10^{-5} I
Ra-226		3×10^{-11} S	4×10^{-7} S	2×10^{-12} I	3×10^{-8} S, 3×10^{-5} I
Pb-210		1×10^{-10} S	4×10^{-6} S	4×10^{-12} S	1×10^{-7} S, 2×10^{-4} I
Po-210		3×10^{-11} I	2×10^{-5} S	1×10^{-12} I	7×10^{-7} S, 3×10^{-5} I
Rn-222				3×10^{-9}	

S = soluble = dissolved

I = insoluble = suspended

Calculation:

Nuclide concentration at the location = Ni

Nuclide concentration at the background location = Nbi

Maximum Permissible Concentration for the nuclide (above) = MPCi

$$\% \text{ MPCi} = \frac{\text{Ni} - \text{Nbi}}{\text{MPCi}} \times 100$$

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