ANACONDA Copper Company
New Mexico Operations
P.O. Box 638
Grants, New Mexico 87020
505/876-2211

9393408

November 8, 1979

Mr. A. F. Czarnowsky
Area Mining Supervisor
UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY
P. O. Box 26124
Albuquerque, New Mexico
87125

Re: Jackpile Mine Reclamation Plan
Report - Third Quarter, 1979

Dear Mr. Czarnowsky:

In accordance with the Jackpile Mine Reclamation Plan, we submit the following data for the Third Quarter of 1979:

1. Radiological Analysis of Ground and Surface Water
2. Chemical Analysis of Ground and Surface Water
3. Results of the Air Monitoring Program
4. Results of the Ambient Radon Study

Sincerely,

Meade A Stirland

Meade A Stirland
Manager, Environmental,
Health and Safety

MAS/bg

Encls.

RECEIVED
NOV 13 1979
U.S. GEOLOGICAL SURVEY
ALBUQUERQUE, NEW MEXICO

AIR QUALITY MONITORING PROGRAM

One 48-hour sample is taken each month at each of the four locations specified by Marc Nelson. They are collected about three meters above the ground on Whatman 41 filter paper, using a RAC Heavy-duty Sampler.

AMBIENT RADON STUDY

One 48-hour sample is collected at each of the air sampling locations as specified by Marc Nelson. These samples are collected about one meter above the ground in 30-liter Tedlar bags, using a modified acquarium pump. The samples are transported to the Environmental Laboratory, transferred to a scintillation cell, and counted.

DESCRIPTIVE LOCATION	DATE	pH	TDS ppm	Cond umhos	HCO_3^- ppm	Cl^- ppm	$SO_4^=$ ppm	Na^+ ppm	K^+ ppm	Ca^{++} ppm	Mg^{++} ppm	NO_3^- ppm	F^- ppm	SiO_2 ppm	Mn^- ppm
Rio Paguate Upstream	9-7-79	8.3	448	740	301	11	118	34	25	54	31	< 1	0.62	25	<.1
Rio Moquino Upstream	9-7-79	8.2	1532	2100	195	16	946	200	24	125	100	< 1	0.84	23	<.1
Rio Paguate Above the Confluence	9-7-79	8.5	752	1200	222	14	373	88	18	69	61	< 1	0.62	18	<.1
Rio Moquino Above the Confluence	9-7-79	8.2	2066	2700	213	20	1281	330	24	160	130	< 1	0.84	14	<.1
Rio Paguate Ford Crossing	9-7-79	8.2	2084	2900	241	14	1333	250	25	180	145	< 1	0.78	17	<.1
Paguate Reservoir	9-7-79	8.1	1944	2575	155	24	1163	345	31	200	100	< 1	0.78	3	<.1
Jackpile #4	9-7-79	8.7	856	1500	341	20	329	310	6	4	1	2	1.40	15	<.1
Jackpile New Shop	9-7-79	8.3	1441	2300	373	28	677	510	11	15	2	2	1.50	11	<.1
Jackpile Old Shop	9-7-79	8.2	1683	2475	308	37	885	450	15	79	49	7	1.30	8	<.1

		As ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm	Cu ppm	Fe ppm	Zn ppm	Mo ppm	Ni ppm	V ppm
Rio Paguate Upstream	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.004	< 0.1	0.003	< 0.01	<0.005	< 0.05
Rio Moquino Upstream	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.005	< 0.1	0.005	< 0.01	<0.005	< 0.05
Rio Paguate Above the Confluence	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.003	< 0.1	0.002	0.01	<0.005	< 0.05
Rio Moquino Above the Confluence	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.005	< 0.01	0.003	< 0.1	0.002	0.01	<0.005	< 0.05
Rio Paguate Ford Crossing	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.005	< 0.1	0.003	0.01	<0.005	< 0.05
Paguate Reservoir	9-7-79	0.008	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.007	< 0.1	0.014	< 0.01	<0.005	< 0.05
Jackpile #4	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.004	< 0.1	0.007	0.02	<0.005	< 0.05
Jackpile New Shop	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.004	< 0.1	0.008	0.01	<0.005	< 0.05
Jackpile Old Shop	9-7-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.005	< 0.1	0.115	0.01	<0.005	< 0.05

JACKPILE - WATER RADIOLOGICAL ANALYSIS
(THIRD Quarter, 1979)

DESCRIPTIVE LOCATION	RADIUM 226 pCi/l					URANIUM-NATURAL ppm				
	JULY	AUGUST	SEPTEMBER			JULY	AUGUST	SEPTEMBER		
Rio Paguate Upstream	1.20	0.24	0.42			0.002	0.002	0.004		
Rio Moquino Upstream	0.60	0.18	0.27			0.006	0.008	0.007		
Rio Paguate Above the Confluence	4.07	4.35	3.19			0.296	0.080	0.134		
Rio Moquino Above the Confluence	4.19	2.79	1.88			0.074	0.050	0.031		
Rio Paguate Ford Crossing	7.54	11.42	3.94			0.595	0.240	0.205		
Mouth of Oak Canyon Wash	NS	NS	NS			NS	NS	NS		
Paguate Reservoir	0.77	0.22	0.27			0.042	0.040	0.004		
Jackpile #4	1.90	0.28	0.13			0.007	0.003	0.002		
Jackpile New Shop	2.62	2.60	1.88			0.020	0.005	0.014		
Jackpile Old Shop	3.01	1.90	1.19			0.130	0.118	0.086		

JACKPILE - WATER CHEMICAL ANALYSIS JULY 1979

DESCRIPTIVE LOCATION	DATE	pH	TDS ppm	Cond umhos	HCO_3^- ppm	Cl^- ppm	$SO_4^=$ ppm	Na^+ ppm	K^+ ppm	Ca^{++} ppm	Mg^{++} ppm	NO_3^- ppm	F^- ppm	SiO_2 ppm	Mn^- ppm
Rio Paguate Upstream	7-16-79	8.4	304	760	46	10	122	25	8	.65	26	1	0.59	24	0.1
Rio Moquino Upstream	7-16-79	8.3	1817	2500	229	22	1169	200	15	153	130	1	0.85	13	0.1
Rio Paguate Above the Confluence	7-16-79	8.5	505	890	214	12	224	41	11	55	32	2	0.71	22	0.1
Rio Moquino Above the Confluence	7-16-79	8.4	1931	2900	197	21	1276	217	14	180	115	1	1.10	9	0.1
Rio Paguate Ford Crossing	7-16-79	8.4	1671	2300	227	21	1056	190	14	160	110	2	1.03	5	0.1
Paguate Reservoir	7-16-79	8.0	2143	3200	227	28	1371	305	16	150	152	1	0.95	7	0.1
Jackpile #4	7-17-79	8.7	856	1700	328	19	346	307	4	3	1	1	1.40	13	0.1
Jackpile New Shop	7-16-79	8.5	1408	2500	360	28	670	498	7	13	2	2	1.45	10	0.1
Jackpile Old Shop	7-16-79	8.1	3532	4700	237	89	2159	460	13	275	192	22	0.92	205	0.1

		As ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm	Cu ppm	Fe ppm	Zn ppm	Mo ppm	Ni ppm	V ppm
Rio Paguate Upstream	7-16-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.007	0.1	0.008	< 0.01	<0.005	< 0.05
Rio Moquino Upstream	7-16-79	0.028	< 0.05	< 0.001	< 0.005	0.01	<0.0005	< 0.01	0.005	0.1	0.011	< 0.1	<0.005	< 0.05
Rio Paguate Above the Confluence	7-16-79	0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.0005	< 0.01	0.008	0.1	0.005	< 0.01	<0.005	< 0.05
Rio Moquino Above the Confluence	7-16-79	0.005	< 0.05	< 0.001	< 0.005	0.01	<0.005	< 0.01	0.010	0.1	0.004	< 0.01	<0.005	< 0.05
Rio Paguate Ford Crossing	7-16-79	<0.005	< 0.05	< 0.001	< 0.005	0.02	<0.0005	< 0.01	0.007	0.1	0.008	< 0.01	<0.005	< 0.05
Paguate Reservoir	7-16-79	0.008	< 0.05	< 0.001	< 0.005	0.01	<0.005	< 0.01	0.009	0.1	0.005	< 0.01	<0.005	< 0.05
Jackpile #4	7-17-79	<0.005	< 0.05	< 0.001	< 0.005	< 0.01	<0.005	< 0.01	0.003	0.1	0.003	< 0.01	<0.005	< 0.05
Jackpile New Shop	7-16-79	<0.005	< 0.05	< 0.001	< 0.005	0.01	<0.0005	< 0.01	0.007	0.1	0.11	< 0.01	<0.005	< 0.05
Jackpile Old Shop	7-16-79	<0.005	< 0.05	< 0.001	< 0.005	0.03	<0.0005	0.49	0.12	0.1	1.05	< 0.01	<0.005	< 0.05

There was a sudden change in the quality of the water in Jackpile Old Shop Well in July 1979. We have no explanation for this. There has been no change in pumping rates or mining activity in this area. The quality of the water has retained to normal in September 1979. We will consider this anomaly in the regional groundwater survey we propose to initiate early in 1980.

JACKPILE - WATER CHEMICAL ANALYSIS AUGUST 1979

DESCRIPTIVE LOCATION	DATE	pH	TDS ppm	Cond umhos	HCO_3^- ppm	Cl^- ppm	$SO_4^=$ ppm	Na^+ ppm	K^+ ppm	Ca^{++} ppm	Mg^{++} ppm	NO_3^- ppm	F^- ppm	SiO_2 ppm	Mn^- ppm
Rio Paguate Upstream	8-2-79	8.4	484	670	322	11	130	36	8	83	28	< 1	0.49	28	<.1
Rio Moquino Upstream	8-2-79	8.2	2175	2800	202	26	1379	322	19	178	132	< 1	0.52	18	<.1
Rio Paguate Above the Confluence	8-2-79	8.6	577	825	257	11	231	63	10	66	41	< 1	0.47	27	<.1
Rio Moquino Above the Confluence	8-2-79	8.4	2261	3100	269	20	1519	353	14	197	6	< 1	0.70	18	<.1
Rio Paguate Ford Crossing	8-2-79	8.2	2249	3000	285	23	1404	325	16	180	138	< 1	0.63	21	<.1
Paguate Reservoir	8-2-79	8.2	2549	3300	259	33	1600	450	20	160	152	< 1	0.63	5	<.1
Jackpile #4	8-2-79	8.7	863	1500	365	17	313	330	4	6	1	< 1	1.15	10	<.1
Jackpile New Shop	8-2-79	8.4	1111	2400	390	26	679	176	7	17	2	< 1	1.25	10	<.1
Jackpile Old Shop	8-2-79	8.4	2030	2900	310	46	1128	471	10	124	76	12	1.10	10	<.1

		As ppm	Ba ppm	Cd ppm	Cr ppm	Pb ppm	Hg ppm	Se ppm	Cu ppm	Fe ppm	Zn ppm	Mo ppm	Ni ppm	V ppm
Rio Paguate Upstream	8-2-79	0.008	< 0.05	< 0.001	0.008	<0.01	<0.0005	< 0.01	0.007	< 0.1	0.002	< 0.01	<0.005	< 0.05
Rio Moquino Upstream	8-2-79	0.005	< 0.05	< 0.001	0.007	<0.01	<0.0005	< 0.10	0.014	< 0.1	0.013	< 0.01	<0.005	< 0.05
Rio Paguate Above the Confluence	8-2-79	0.005	< 0.05	< 0.001	0.007	<0.01	<0.0005	< 0.01	0.009	< 0.1	0.002	< 0.01	<0.005	< 0.05
Rio Moquino Above the Confluence	8-2-79	0.005	< 0.05	< 0.001	0.006	<0.01	<0.0005	< 0.01	0.006	< 0.1	0.001	< 0.01	<0.005	< 0.05
Rio Paguate Ford Crossing	8-2-79	0.005	< 0.05	< 0.001	0.009	<0.01	<0.0005	< 0.01	0.006	< 0.1	<0.001	< 0.01	<0.005	< 0.05
Paguate Reservoir	8-2-79	0.009	< 0.05	< 0.001	0.006	<0.01	<0.0005	0.01	0.008	< 0.1	0.007	< 0.01	<0.005	< 0.05
Jackpile #4	8-2-79	<0.005	< 0.05	< 0.001	<0.005	<0.01	<0.0005	< 0.01	0.006	< 0.1	0.013	< 0.01	<0.005	< 0.05
Jackpile New Shop	8-2-79	<0.005	< 0.05	< 0.001	0.008	< .01	<0.0005	< 0.01	0.004	0.2	0.004	< 0.01	<0.005	< 0.05
Jackpile Old Shop	8-2-79	0.006	< 0.05	< 0.001	0.014	<0.01	<0.0005	0.24	0.020	< 0.1	0.16	< 0.01	<0.005	< 0.05

CONFIDENTIAL

JACKPILE - AIR SAMPLING SURVEY

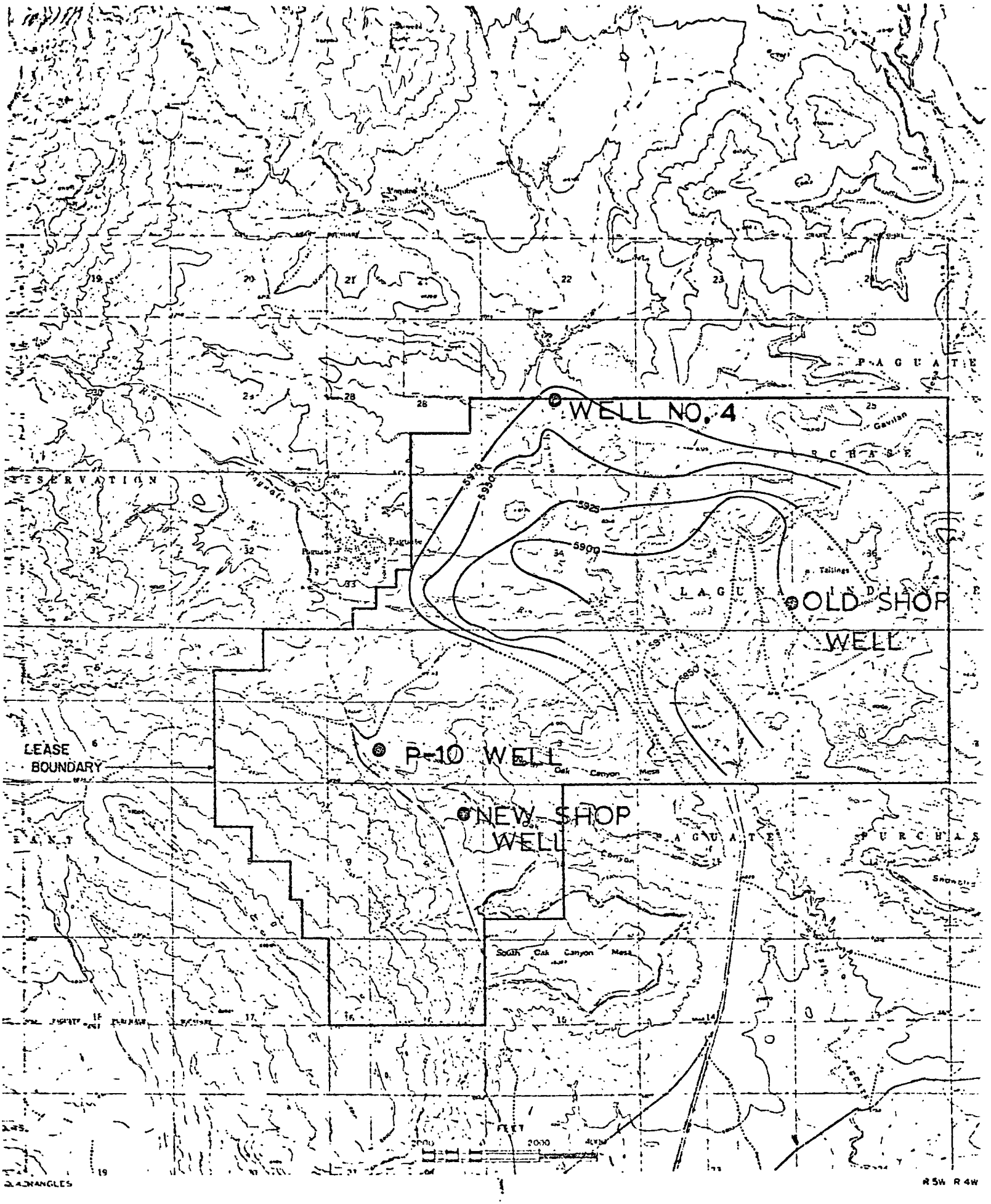
(Third Quarter, 1979)

Location	Date	Total Particulate $mg/M^3 \times 10^{-8}$	U-Nat. $\mu ci/ml \times 10^{-15}$	Ra-226 $\mu ci/ml \times 10^{-18}$	Th-230 $\mu ci/ml \times 10^{-18}$	Pb-210 $\mu ci/ml \times 10^{-18}$
1. Dump F	7/79	5.44	9.06	1.39	43.58	66.24
	8/79	8.26	3.44	2.02	1.62	40.48
	9/79	8.25	3.09	2.37	77.56	74.64
2. Mine Vent	7/79	0.31	3.23	0.50	15.54	23.63
	8/79	2.72	7.32	0.71	2.36	47.23
	9/79	0.62	5.65	0.73	0.47	5.47
3. Westgate	7/79	0.66	5.68	7.02	62.70	21.74
	8/79	6.40	3.85	2.77	4.32	26.20
	9/79	1.19	5.14	8.64	47.94	49.39
4. Well #4	7/79	0.44	5.57	2.19	31.06	21.94
	8/79	0.33	7.63	1.02	3.90	13.57
	9/79	0.57	7.12	2.05	42.24	33.22

JACKPILE - AMBIENT RADON STUDY

(Third Quarter, 1979)

Location	Date	Rn-222 pCi/l
1. Dump F	7/79	0.63
	8/79	0.58
	9/79	0.06
2. Mine Vent	7/79	0.17
	8/79	0.83
	9/79	1.34
3. Well #4	7/79	0.06
	8/79	0.10
	9/79	0.31
4. Westgate	7/79	<0.01
	8/79	0.17
	9/79	0.10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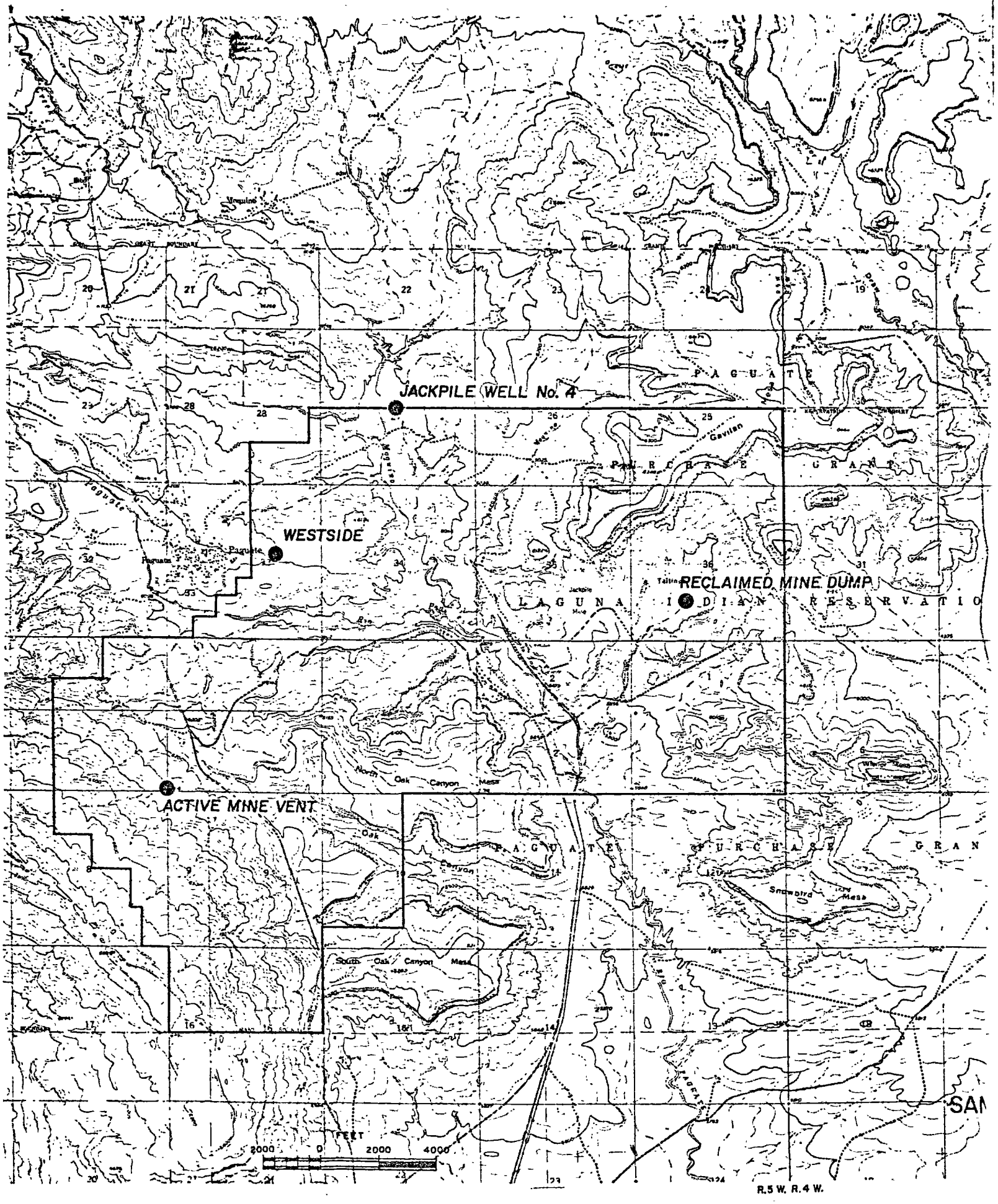
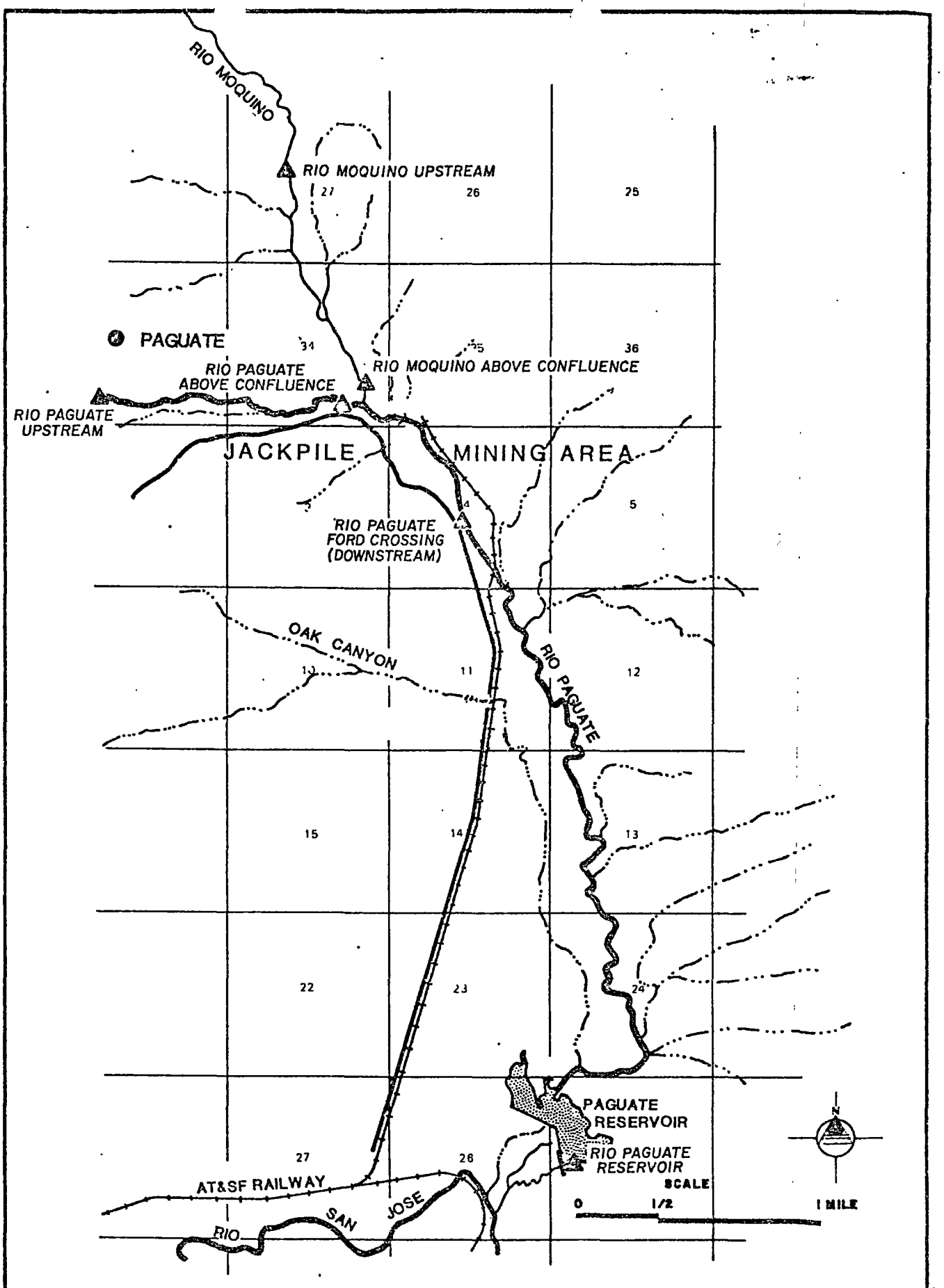
OLD SHOP WELL
P-10 WELL
NEW SHOP WELL
LEASE BOUNDARY
5970
5930
5925
5900
5850
PAGUATE
LAGUNA INDIAN
RESERVATION
Paguate
Tailings
Oak Canyon Mesa
South Oak Canyon Mesa
Gavilan
Snowdrift
FEET
2000
4000
R 5W R 4W


JACKPILE WELL No. 4
WESTSIDE
RECLAIMED MINE DUMP
ACTIVE MINE VENT
PAGUATE
PURCHASE GRANT
LAGUNA INDIAN RESERVATIO
Paguate
Gavilan
North Oak Canyon Mesa
South Oak Canyon Mesa
Snowbird Mesa
FEET
2000 0 2000 4000
R.5 W. R.4 W.



LOCATION OF
SURFACE WATER MONITORING STATIONS

DAMES & MOORE